2021 Engineering Assessments of Coal Combustion Residual (CCR) Facilities, Intermountain Power Plant, Delta, Utah

Prepared for
Intermountain Power Service Corporation (IPSC)
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1.1 GENERAL

This document presents engineering assessments of coal combustion residual (CCR) facilities at the Intermountain Power Plant (IPP), near Delta, Utah (see Figure 1-1). These assessments are generally made pursuant to the following sections/paragraphs of Code of Federal Regulations (CFR) Title 40 “Protection of Environment”, Part 257 “Criteria for Classification of Solid Waste Disposal Facilities and Practices,” Subpart D “Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments”:

- Section 73: Structural integrity criteria for existing CCR surface impoundments:
  - 257.73 (a)(2): Periodic hazard potential classification assessment
  - 257.73 (d): Periodic structural stability assessment
  - 257.73 (e): Periodic safety factor assessment.
- Section 81: Run-on and run-off controls for CCR landfills:
  - 257.81 (c): Run-on and run-off control system plan.
- Section 82: Hydrologic and hydraulic capacity requirements for CCR surface impoundments:
  - 257.82 (c): Inflow design flood control system plan.

The Intermountain Power Plant is owned by Intermountain Power Agency (IPA) and operated by Intermountain Power Service Corporation (IPSC). Existing CCR surface impoundments at the facility include the Bottom Ash Basin and the Waste Water Basin. Existing facilities also include a CCR landfill, referred to as the Combustion By-Products Landfill. These CCR units are shown in Figure 1-2.

The Bottom Ash Basin was commissioned in 1986. The Bottom Ash Basin receives bottom ash sluiced from the boilers and the boiler area sump. The Basin also provides decant water to the ash water recycle basin for reuse in the ash water system and the sulfur dioxide removal system. The major sources of materials placed in the basin are the bottom ash, boiler slag, and other process materials including pulverized rejects, and chemical clean residue.

The Waste Water Basin was commissioned in 1986. The major sources of materials placed in the basin include flue gas emission control residuals and other process material including process water separated for re-use, wash down, coal pile run-off, boiler blowdown, cooling tower blowdown, regenerant, rinsate, leachate from bottom ash, boiler slag, and pulverized rejects. After solids have settled, the water is reused.

The Combustion By-Products Landfill was commissioned in 1986. The major sources of materials placed in the landfill include dewatered blowdown from the scrubbers mixed with fly ash from the baghouse, and settled-out solids from both the Bottom Ash Basin and Waste Water Basin.

In the context of Title 40, Part 257 requirements, the Intermountain Power Plant (IPP) does not discharge water to any waterway and is not located on any waterway.

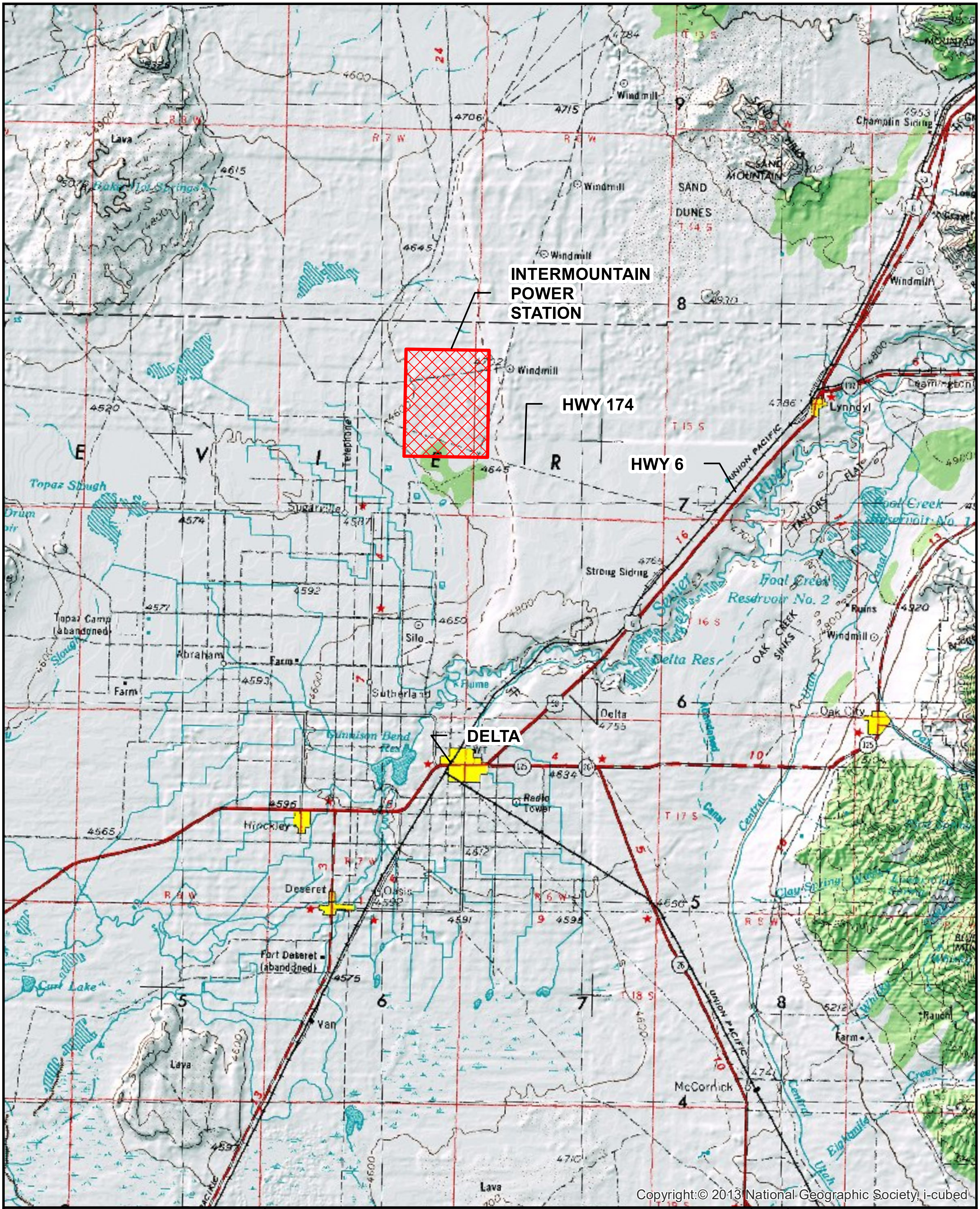
1.2 PURPOSE, AUTHORIZATION, AND SCOPE OF WORK

This report presents the results of engineering assessments performed by Gerhart Cole Inc. (GC) for IPSC in response to federal requirements pertaining to the disposal of coal combustion residuals (CCR), pursuant to CFR Title 40, Part 257.

The subjects of our assessments presented in this document are 1) the Bottom Ash Basin, 2) the Waste Water Basin, and 3) the Combustion By-Products Landfill.

1.3 REFERENCES TO CFR

To facilitate its use, this document references specific sections, paragraphs and clauses of CFR Title 40, Part 257, using the Title's nomenclature such as 257.73(c)(1)(i).



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Assessment of Coal Combustion Residual Facilities

Intermountain Power Plant

Figure 1-1

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Assesment of Coal Combustion Residual Facilities

Intermountain Power Plant

Figure 1-2

2.1 BOTTOM ASH BASIN – GENERAL

This CCR unit is owned by Intermountain Power Agency (IPA) and operated by Intermountain Power Service Corporation (IPSC). It is officially identified as Intermountain Power Bottom Ash Basin (UT00463).

This CCR unit is located approximately 11 miles north of Delta, Utah, in Millard County, Utah, at approximately latitude 39.51832 degrees North, Longitude -112.60009 degrees West, as shown in Figure 1-1. Figure 1-2 shows CCR facilities at the IPP at a larger scale.

The CCR unit is used to dewater/decant bottom ash slurry from the boilers and the boiler area sump via settlement and evaporation.

Construction records for this CCR unit are scant. Based on available information, construction of the Intermountain Power Plant began in about September 1981. Available drawings for the facility's impoundment/ponds and embankments are dated 1983, and the unit was commissioned in 1986. It is believed that the unit was built in a single stage of construction.

The Bottom Ash Basin is constructed using a combination of above ground embankment/dike and below original grade incision. Accordingly, this unit is not considered an incised CCR unit.

The upper portion of the Bottom Ash Basin embankment is constructed of compacted fill (borrow) material consisting of on-site native soils which, based on test holes drilled in the embankment, generally consist of Clayey Sand (SC, SP-SC) and Poorly graded Sand (SP). The lower portion of the embankment consists of native, in-place (non-fill) soils which, based on test holes drilled in the embankment, generally classify as Poorly graded Sand (SP) and Silty Sand (SM). At depth below the floor of the basin, there are various strata, including a fairly continuous layer of Sandy Lean Clay (CL). Other than the fill and natural portions of the embankment, there appears to be no explicit zonation of materials or special foundation treatments.

Additional information regarding the physical and/or engineering properties of the materials constituting the foundation and embankment which make up this CCR unit is provided in Section 2.4 of this report.

The Bottom Ash Basin is a relatively large basin, nominally 2,250 feet long and 2,050 feet wide. The Bottom Ash Basin is externally bounded by embankments having a minimum design crest width of about 20 feet (effectively 25 feet based on field observations and measurements) and approximately 3H:1V side slopes both upstream and downstream (i.e., interior and exterior). The embankments (crest Elev. 4684 feet) are approximately 45 feet tall relative to the interior floor (Elev. 4639 feet), based on design drawings, and are a maximum of 36 feet tall relative to the east and west exteriors, based on field measurements. Field surveys indicate central portions of the basin are somewhat lower, being near Elev. 4637 feet. The south end of the Bottom

Ash Basin is bounded by the adjoining non-CCR Ash Water Recycle Basin. Relative to the floor of the Ash Water Recycle Basin (which has the same nominal elevation of 4639 feet), the Bottom Ash Basin is approximately 45 feet tall. The latter height is considered to be the nominal "height" of the structure, being the vertical measurement from the downstream/exterior toe of the unit at its lowest point to the lowest elevation of the crest of the unit. The Bottom Ash Basin is internally subdivided into three sections (cells) with intermediate embankments. These embankments are contained within the overall perimeter of the Bottom Ash Basin. Elevations are based on 1929 Mean Sea Level datum, as used in the original design drawings and power plant datum.

This unit is an "off-channel" structure, built substantially above surrounding grade, and therefore only receives meteoric water and the water that is pumped into it. The unit does not receive any runoff from adjoining areas. As such, the facility is designed and operated without a spillway structure.

Inlets to each partition within the Bottom Ash Basin include four 10-inch diameter steel pipes placed on the north embankment crest that discharge directly into energy dissipation discharge structures. The energy dissipation structures consist of a 4-foot wide, 3-foot high concrete rundown structure containing several 18-inch wide baffleblocks spaced on about 3-foot centers. An outlet drop-inlet decant structure is provided at the south end of each section/cell. The concrete descant structures are 8-foot by 14-foot- by 47-foot high (approximate dimensions), and direct water into 24-inch steel, concrete encased discharge pipes that convey fluids to the non-CCR Ash Water Recycle Basin.

In July of 2021, the outlet of the east section (cell #1) of the Bottom Ash Basin was filled with approximately 50 yards of concrete to prevent water from flowing into the cell from the Ash Recycle Basin and allow cell #1 to be dewatered to stop a possible leak. As such, this cell does not drain as initially intended. However, materials are also no longer being placed in this section, and impounded water is being pumped into the adjoining section, resulting in less than 5 feet of water in impoundment. Pumping efforts will continue until all water has been removed from the cell. It is planned that future operations will continue to maintain such conditions.

Based on field surveys, the storage volume of the Bottom Ash Basin, when empty, is approximately 3000 acre-feet without accounting for approximately 3 feet of freeboard. The normal operating pool surface elevation varies depending upon CCR handling activities within the basin. The maximum normal operating pool surface elevation in one section is reported as less than 4681 feet. When this elevation is reached (or before), discharge operations switch to another section to allow for CCR dewatering and subsequent removal from the section for placement within the Combustion By-Product Landfill.

The maximum pool surface elevation following peak discharge from the inflow design flood is simply the operating pool surface elevation plus the amount of meteoric water received, as discussed hereafter in Section 2.5. We understand this elevation is maintained by standard operating procedures to be less than Elev. 4681 feet in each section.

Area-capacity curves for this CCR unit, developed by Grimshaw Surveying and provided by IPSC, are presented in Appendix C.

This CCR unit is lined with a high density polyethylene (HDPE) geomembrane, nominally 60 to 80 mils thick, depending on location. This membrane rests directly on embankment material.

Select drawings and specifications excerpted from available design and construction information for this unit are presented in Appendix A of this report. Additional cross-sections of the embankments, based on post-construction geotechnical studies, are presented in Section 2.4 and Appendix B of this report.

Existing instrumentation for this unit includes a staff gauge to monitor the water surface pool elevation in the unit and also 11 "perched" groundwater monitoring wells, located outside the embankment. These wells have been used to help assess potential leakage from the lined CCR unit. Although not considered part of CCR unit instrumentation, there are 24 survey monuments located along the periphery (crest) of the unit. We have considered data from these monuments in our subsequent assessment of unit stability.

Because this unit does not have spillways or diversion features, capacities and substantiating calculations are not presented herein.

To our knowledge there is no record of structural instability of this CCR unit. Additional discussion of stability is presented in Section 2.3.

2.2 BOTTOM ASH BASIN – HAZARD POTENTIAL CLASSIFICATION [257.73(a)(2)]

As stated previously, the Bottom Ash Basin is constructed using a combination of above ground embankment/dike and below original grade incision. Accordingly, this unit is not considered an incised CCR unit.

The Bottom Ash Basin covers approximately 105 acres and has a nominal capacity of 3,000 acre-feet without accounting for freeboard, with a maximum design depth of 46 feet (actual maximum survey depth [2016 data] of 47 feet).

This CCR unit classifies as a Low Hazard Potential CCR surface impoundment. This classification reflects the classification provided by the Utah Department of Natural Resources, Division of Water Rights, Dam Safety Section, which considers low hazard dams to be those dams which, if they fail, would cause minimal threat to human life, and economic losses would be minor, or limited to damage sustained by the owner of the structure. This corresponds to the Title 40, Part 257 definition of Low Hazard Potential. The classification is assessed on a periodic (5-year) basis as part of the State's inspection and review process, for which we understand a site inspection was last undertaken May 14, 2019. GC concurs with this classification and is of the opinion that the classification is in accordance with the requirements of 257.73.

It should be noted that detailed inspections of the units are performed annually by licensed professional engineers, and routine inspections of the CCR impoundments are also performed at intervals not exceeding seven days.

With its inherently adverse high desert climate (i.e., hot dry summers and cold winters), this unit has sparse vegetation with areas of bare earth. GC understands that IPSC continues to work to establish and re-establish this vegetation.

2.3 BOTTOM ASH BASIN – STRUCTURAL STABILITY ASSESSMENTS [257.73(d)]

We are of the opinion that the design, construction, operation, and maintenance of the Bottom Ash Basin is consistent with recognized and generally accepted good engineering practices, for the maximum volume of CCR and CCR waste water that can be impounded. This assessment is based on our review of construction drawings and specifications, the results of post-construction geotechnical studies, periodic observations reported by IPSC, and our own observations.

The stability of this CCR unit's embankment and foundation soils can be demonstrated by adequate factors of safety with respect to shear failure, as presented hereafter in Section 2.4. Stability can also be demonstrated by the lack of visual distress during periodic observations, as well as minimal movement in the 24 survey settlement monuments placed along the embankment.

The accuracy of the settlement monuments (first placed in 2012 and surveyed approximately annually) is reported to be plus-or-minus 0.05 feet (0.6 inches). The variance exhibited by each monuments throughout the entire monitoring period is within the anticipated limit of accuracy (i.e., the difference between maximum and minimum measurements of each monument is less than 1.2 inches), with a median variance of about 0.6 inches. Review of the data indicates that there are no trends showing appreciable movement with respect to time, thus corroborating our opinion that any apparent movement from year to year is primarily survey noise, and there is no indication of progressive, adverse movement or reduction in stability.

Because the unit is lined with an HDPE liner, there is minimal concern regarding adverse effects of surface erosion, wave action, and adverse effects of sudden drawdown on the earthen materials inside the basin. The basin is protected at the inlet points with the aforementioned concrete energy dissipaters. External to the basin, it appears that there are regular and adequate maintenance efforts to control and otherwise prevent erosion of the embankment material.

Based on a review of construction specifications (which required compaction of at least 90% of the maximum density as determined by ASTM D1557), as well as penetration test results obtained during post-construction geotechnical stability assessments of the embankments, we are of the opinion that the embankments (dikes) are compacted to a density sufficient to withstand the range of loading conditions to which the CCR unit is anticipated to be subjected.

As stated previously, with its inherently adverse climate, this unit has sparse vegetation with some areas of bare earth on the exterior of the basin. GC understands that IPSC has worked to establish and re-establish this vegetation. Other maintenance activities include the eradication of burrowing animals as needed.

As described previously, given the nature and configuration of this CCR unit, it does not have a spillway or diversions. This is discussed further in Section 2.5 of this document, relative to 257.82. Due to its low hazard potential, the design flood discharge, were it applicable, would be based on a 100-year flood.

Hydraulic features passing through the CCR unit are inlet and outlet piping. Based on visual observations and reported behavior during operations, there are no indications of structural inadequacy relative to the pipes and outlet structures. Scheduled observations are made and reported by qualified persons relative to potential indicators of structural distress. Such indicators include excessive, turbid, or sediment-laden seepage; signs of piping or internal erosion; transverse or longitudinal cracking; slides, bulges, boils, sloughs, scarps, sinkholes, or depressions; abormally high or low pool levels; animal burrows; excessive or lacking vegetative cover; slope erosion; or appearance of debris.

Apart from the south embankment, all of the downstream embankment slopes of the Bottom Ash Basin are such that they are not exposed to external bodies of water. The south embankment is common with the non-CCR ash water recycle basin. This basin is also lined, so the embankment slope is not subject to rapid-drawdown conditions. The south embankment slope presents an adequate factor of safety with respect to potential structural instability which would derive from the shearing of embankment and/or foundation soils, as shown subsequently in Section 2.4.

2.4 BOTTOM ASH BASIN – "SAFETY FACTOR" ASSESSMENTS [257.73(e)]

Minimum factors of safety with respect to slope stability have been calculated for the Bottom Ash Basin using several potentially critical cross sections. These calculations were performed using a method-of-slices approach with Bishop's simplified/modified method for evaluating both force and moment equilibrium. Failure was constrained to breaching failures, where a sufficient portion of the cross-section of the embankment slips to allow release of at least a portion of the impoundment's contents to the surrounding area. Shallow failures are not included in these analyses as they would not result in breach or discharge of material. Both static and pseudo-static (i.e., dynamic or seismic) loading conditions were considered. A rapid drawdown case was not considered since the basin is lined.

For the seismic case, a horizontal seismic coefficient (k_h) equal to half the peak ground acceleration for the site was used. The mapped peak ground acceleration for the site is about 0.17g (based on B/C boundary conditions), representing a 2% probability of exceedance (i.e., 98% probability of non-exceedance) in 50 years (which equates to an average return period of about 2,475 years [nominally 2,500 years]), as reported by the

USGS via its Unified Hazard Tool and deriving from its 2014 National Seismic Hazard Mapping Project (the most recent maps for which full hazard deaggregations are available and which serve as the basis for most current seismic design codes). This value was then adjusted to 0.25g to account for local soil (Site Class D) conditions, consistent with 2015 NEHRP recommendations. Hence, the horizontal seismic coefficient used in the analyses is 0.13. Also with respect to the seismic case, a composite Mohr-Coulomb failure envelope was also used, with drained strengths at low stresses and undrained strengths for clays at high confining stresses. Soil strengths were reduced by approximately 20 percent to account for possible soil softening caused by cyclic loading.

Additional details regarding development of strength parameters and cross-sections are presented in our original slope stability assessment report titled, "IPP Coal Combustion Waste Ponds, Geotechnical Stability Analysis Report," prepared for IPSC by Gerhart Cole Inc., and dated April 2013, as well as our subsequent report "2016 Engineering Assessments of Coal Combustion Residual (CCR) Facilities, Intermountain Power Plant," prepared for IPSC by Gerhart Cole Inc., and dated October 17, 2016. The stability analyses performed for those reports were reassessed for the purposes of this present report.

Graphical results showing the calculated critical surfaces and factors of safety for various cross-sections are presented in Appendix B (Figure B-1 through Figure B-10), with the factors of safety also summarized in Table 2-1. As can be seen in the Table, the calculated static factors of safety under the long-term, maximum storage pool loading condition for the various potential critical sections are all at least 1.50. In the case of this unit, the maximum surcharge pool is essentially the same as the long-term maximum storage pool; consequently, separate factors of safety for the maximum surcharge pool were not calculated. The calculated seismic (pseudo-dynamic) factors of safety for all cross-sections are at least 1.00. As such, we consider this unit stable with respect to global slope stability.

Liquefaction analyses were performed using the methods of Youd et al. (2001) for granular layers located below the existing groundwater table (nominally located at a depth of 50 feet below the crest of the embankments). Test hole data representing these layers is presented in our original stability assessment report titled, "IPP Coal Combustion Waste Ponds, Geotechnical Stability Analysis Report," prepared for IPSC by Gerhart Cole Inc., and dated April 2013. The seismic analysis event was obtained from the modal event from the deaggregation previously referenced with regards to slope stability, corresponding to ground motions with a 2% probability of exceedance (i.e., 98% probability of non-exceedance) in 50 years. This event has a moment magnitude of 5.5 at a distance of about 11 km.

The minimum calculated factor of safety against triggering liquefaction was 2.2, corresponding to conditions near the northern embankment near a depth of about 50 feet. This is well in excess of the minimum 1.2 value required. It should be recognized that as performed, this analysis does not take into account the geologic age of the deposits at the critical depth; doing so would likely result in even a larger factor of safety. As such, we consider this unit stable with respect to any potential liquefaction.

2.5 BOTTOM ASH BASIN – HYDROLOGIC AND HYDRAULIC CAPACITY [257.82(c)]

For the low hazard potential classification of this unit, the inflow design flood is a 100-year event. However, as stated previously, this unit is an “off-channel” structure which is built substantially above surrounding grade, and only receives meteoric water and the water that is pumped into it. The unit does not receive runoff from adjoining areas. As such, there is no inflow design flood control system.

Per NOAA Atlas 14, Volume 1, Version 5 (data server), the precipitation event near Delta, Utah, corresponding to a 100-year, 24-hour event is 1.97 inches. Given the area of the basin together with the minimal additional contributory areas represented by adjoining roads along the crests of the embankment, we are of the opinion that this impoundment unit can readily accommodate this precipitation within the 3-foot nominal freeboard volume available, and thus meet the intent of 257.82 requirements.

Table 2-1 Summary of Slope Stability Analysis Results – Bottom Ash Basin

Scenario / Location	Figure No.	Factor of Safety	
		Static	Seismic
North Embankment of Bottom Ash Basin	B-1,B-2	2.54	1.11
Southeast Corner of Bottom Ash Basin, East Embankment	B-3,B-4	2.47	1.30
Southeast Corner of Bottom Ash Basin, South Embankment	B-5,B-6	2.24	1.19
Southwest Corner of Bottom Ash Basin, West Embankment	B-7,B-8	2.56	1.35
Southwest Corner of Bottom Ash Basin, South Embankment	B-9,B-10	2.34	1.24

3.1 WASTE WATER BASIN – GENERAL

This CCR unit is owned by Intermountain Power Agency (IPA) and operated by Intermountain Power Service Corporation (IPSC). It is officially identified as Intermountain Power Waste Water Basin (UT00468).

This CCR unit is located approximately 11 miles north of Delta, Utah, in Millard County, Utah, at approximately latitude 39.50784 degrees North, Longitude -112.60009 degrees West, as shown in Figure 1-1. Figure 1-2 shows CCR facilities at the IPP at a larger scale.

This CCR unit is being used to store waste water from various sources. During storage, CCR settles out via gravity. Water from the basin is decanted into a structure after which it is pumped either to the non-CCR Ash Water Recycle Basins or non-CCR Evaporation Ponds.

Construction records for this CCR unit are scant. Based on available information, construction of the Intermountain Power Plant started in about September 1981. Available drawings for the facility's impoundments/ponds and embankments are dated 1983, and the unit was commissioned in 1986. It is believed that the unit was built in a single stage of construction.

The Waste Water Basin is constructed using a combination of above ground embankment/dike and below original grade incision. Accordingly, this unit is not considered an incised CCR unit.

The upper portion of the Waste Water Basin embankment consists of fill material derived from native soils, which, based on test holes drilled in the embankment, generally consist of Clayey Sand (SP-SC). The lower portion of the embankment consists of native, in-place (non-fill) soils that, based on test holes drilled in the embankment, generally classify as Silty Sand (SM), Clayey Sand (SC), and Sandy Lean Clay (CL). At depth below the floor of the basin, there are various strata, including a rather continuous layer of Sandy Lean Clay (CL). Other than the fill and natural portions of the embankment, there appears to be no explicit zonation of materials or special foundation treatments.

Additional information regarding the physical and/or engineering properties of materials constituting the foundation and embankment comprising this CCR unit is provided in Section 3.4 of this report.

The Waste Water Basin presents a footprint of about 1,500 feet square. The unit is bounded on all sides by embankments, having a minimum design crest width of about 20 feet (effectively 25 feet based on field observations and measurements) and approximately 3H:1V side slopes both upstream and downstream (i.e., interior and exterior). The embankments (crest Elev. 4650 feet) are approximately 20 feet tall relative to the interior floor (Elev. 4630 feet) based on design drawings, and about a maximum of 12 feet tall relative to the existing ground surface, based on field measurements. Field surveys indicate that the central portion of the basin is somewhat lower, being near Elev. 4628 feet. The 12-foot height is considered to be the nominal "height" of the structure, being the vertical measurement from the downstream/exterior toe of the unit at its lowest point to the lowest elevation of the crest of the unit. Elevations are based on 1929 Mean Sea Level datum, as used in the original design drawings.

This unit is an "off-channel" structure that is built substantially above surrounding grade and only receives meteoric water and the water that is pumped into it. The unit does not receive any runoff from adjoining areas. As such, the facility is designed and operated without a spillway structure.

The inlet to the Waste Water Basin is a buried inlet pipeline located near the northeast corner of the basin, along the east embankment. The outlet consists of a drop-inlet structure located at the north end of the basin that feeds water to the Waste Water Basin pump station, where the water is subsequently pumped to other facilities.

Current operation of the Waste Water Basin includes a clay dike running east to west that has been installed to allow the southern portion to be dewatered to stop a possible leak. Dewatering efforts will continue until all water is removed from the southern portion.

Based on field surveys, the storage volume of the Waste Water Basin, when empty, is approximately 765 acre-feet (650 acre-feet design plan) without accounting for approximately 3 feet of freeboard. The maximum normal operating pool surface is reported as approximately Elev. 4647 feet.

The maximum pool surface elevation following peak discharge from the inflow design flood is simply the operating pool surface elevation plus the amount of meteoric water received, as discussed hereafter in Section 3.5. We understand this elevation is maintained by standard operating procedures to be less than Elev. 4647 feet.

Area-capacity curves for this CCR unit, developed by Grimshaw Surveying and provided by IPSC, are presented in Appendix C.

This CCR unit is lined with a high density polyethylene (HDPE) geomembrane, nominally 60 to 80 mils thick, depending on location. This membrane rests directly on embankment material.

Select drawings and specifications excerpted from available design and construction information for this unit are presented in Appendix A of this report. Additional embankment cross-sections, based on post-construction geotechnical studies, are presented in Section 3.4 and Appendix B of this report.

Existing instrumentation for this unit includes a staff gauge to monitor the water surface pool elevation in the unit and also 7 "perched" groundwater monitoring wells, located outside the embankment. These wells have been used to help assess potential leakage from the lined CCR unit. Although not considered part of CCR unit instrumentation, there are 16 survey monuments located along the periphery (crest) of the unit. We have considered data from these monuments in our subsequent assessment of unit stability.

Because this unit does not have spillways or diversion features, capacities and substantiating calculations are not presented herein.

To our knowledge there is no record of structural instability of this CCR unit. Additional discussions of stability are presented in Section 3.3.

3.2 WASTE WATER BASIN – HAZARD POTENTIAL CLASSIFICATION [257.73(a)(2)]

As stated previously, the Waste Water Basin is constructed using a combination of above ground embankment/dike and below original grade incision. Accordingly, this unit is not considered an incised CCR unit.

The Waste Water Basin, as planned, covers approximately 53 acres and has a nominal capacity of 650 acre-feet without accounting for a nominal 3 feet of freeboard, with a maximum design depth of 20 feet (actual maximum 2016 survey depth of 22 feet). A 2016 survey indicates that the actual capacity (again without freeboard) is closer to 765 acre-feet.

This CCR unit classifies as a Low Hazard Potential CCR surface impoundment. This classification reflects the classification provided by the Utah Department of Natural Resources, Division of Water Rights, Dam Safety Section, which considers low hazard dams to be those dams which, if they fail, would cause minimal threat to human life, and economic losses would be minor, or limited to damage sustained by the owner of the structure. This corresponds to the Title 40, Part 257 definition of Low Hazard Potential. The classification is assessed on a periodic (5-year) basis as part of the State's inspection and review process, for which we understand a site inspection was last undertaken May 14, 2019. GC concurs with this classification and is of the opinion that the classification is in accordance with the requirements of 257.73.

It should be noted that detailed inspections of IPP facilities are performed annually by licensed professional engineers, and routine inspections of the CCW impoundments are also performed at intervals not exceeding seven days.

With its inherently adverse high desert climate (i.e., hot, dry summers and cold winters), this unit has sparse vegetation with some areas of bare earth. GC understands that IPSC continues to work to establish and re-establish this vegetation.

3.3 WASTE WATER BASIN – STRUCTURAL STABILITY ASSESSMENTS [257.73(d)]

We are of the opinion that the design, construction, operation, and maintenance of the Waste Water Basin is consistent with recognized and generally accepted good engineering practices for the maximum volume of CCR and CCR waste water that can be impounded. This assessment is based on a review of construction drawings and specifications, the results of post-construction geotechnical studies, periodic observations reported by IPSC, and our own observations.

Stability of this CCR unit's embankment and foundation soils can be demonstrated by adequate factors of safety with respect to shear failure, as presented hereafter in Section 3.4. Stability can also be demonstrated by the lack of visual distress during periodic observations, as well as minimal movement in the 16 survey settlement monuments placed along the embankment.

The accuracy of the settlement monuments (first placed in 2012 and surveyed approximately annually) is reported to be plus-or-minus 0.05 feet (0.6 inches). The variance exhibited by each monuments throughout the entire monitoring period is within the anticipated limit of accuracy (i.e., the difference between maximum and minimum measurements of each monument is less than 1.2 inches), with a median variance of about 0.7 inches. Monuments located along the southwest quadrant of the basin embankment tend to present the largest variances. Review of the data indicates that there are no trends showing appreciable movement with respect to time, thus corroborating our opinion that any apparent movement from year to year is primarily survey noise, and there is no indication of progressive, adverse movement or reduction in stability. For future assessments, we recommend continued monitoring.

Because the unit is lined with an HDPE liner, there is minimal concern regarding adverse effects of surface erosion, wave action, and adverse effects of sudden drawdown. External to the basin, it appears that there are regular and adequate maintenance efforts to control and otherwise prevent erosion of the embankment material.

Based on a review of the construction specifications (which required compaction of at least 90% of the maximum density as determined by ASTM D1557) as well as penetration test results obtained during post-construction geotechnical stability assessments of the embankments, we are of the opinion that the embankments (dikes) are compacted to a density sufficient to withstand the range of loading conditions to which the CCR unit is subjected.

As stated previously, with its inherently adverse climate, this unit has sparse vegetation with some areas of bare earth on the exterior of the basin. GC understands that IPSC has worked to establish and re-establish this vegetation. Other maintenance activities include the eradication of burrowing animals as needed.

As described previously, given the nature and configuration of this CCR unit, it does not have a spillway or diversions. This is discussed further in Section 3.5 of this document, relative to 257.82. Due to its low hazard potential, the design flood discharge, were it applicable, would be based on a 100-year flood.

Hydraulic features passing through the CCR units are inlet and outlet piping. Based on visual observations and reported behavior during operations, there are no indications of inadequate structural integrity. Scheduled observations are made and reported by qualified persons relative to potential indicators of structural distress. Such indicators include excessive, turbid, or sediment-laden seepage; signs of piping or internal erosion; transverse or longitudinal cracking; slides, bulges, boils, sloughs, scarps, sinkholes, or depressions; abormally high or low pool levels; animal burrows; excessive or lacking vegetative cover; slope erosion; or appearance of debris.

All of the downstream, external embankment slopes of the Waste Water Basin are such that they are not exposed to bodies of water.

3.4 WASTE WATER BASIN – "SAFETY FACTOR" ASSESSMENTS [257.73(e)]

Minimum factors of safety with respect to slope stability have been calculated for the Waste Water Basin using two potentially critical cross sections. These calculations were performed using a method-of-slices approach with Bishop's simplified/modified for evaluating both force and moment equilibrium. Failure was constrained to breaching failures, where a sufficient portion of the cross-section of the embankment slips to allow release of at least a portion of the impoundment's contents to the surrounding area. Shallow failures are not included in these analyses as they would not result in breach or discharge of material. Both static and pseudo-static (i.e, dynamic or seismic) loading conditions were considered. A rapid drawdown case was not considered since the basin is lined.

For the seismic case, a horizontal seismic coefficient (k_h) equal to half the peak ground acceleration for the site was used. The mapped peak ground acceleration for the site is about 0.17g (based on B/C boundary conditions), representing a 2% probability of exceedance (i.e., 98% probability of non-exceedance) in 50 years (which equates to an average return period of about 2,475 years [nominally 2,500 years]), as reported by the USGS via its Unified Hazard Tool and deriving from its 2014 National Seismic Hazard Mapping Project (the most recent maps for which full hazard deaggregations are available and which serve as the basis for most current seismic design codes). This value was then adjusted to 0.25g to account for local soil (Site Class D) conditions, consistent with 2015 NEHRP recommendations. Hence, the horizontal seismic coefficient used in the analyses is 0.13. Also with respect to the seismic case, a composite Mohr-Coulomb failure envelope was also used, with drained strengths at low stresses and undrained strengths for clays at high confining stresses. Soil strengths were reduced by approximately 20 percent to account for possible soil softening caused by cyclic loading.

Additional details regarding development of strength parameters and cross-sections are presented in our original slope stability assessment report titled, "IPP Coal Combustion Waste Ponds, Geotechnical Stability Analysis Report," prepared for IPSC by Gerhart Cole Inc., and dated April 2013, as well as our subsequent report "2016 Engineering Assessments of Coal Combustion Residual (CCR) Facilities, Intermountain Power Plant," prepared for IPSC by Gerhart Cole Inc., and dated October 17, 2016. The stability analyses performed for those reports were reassessed for the purposes of this present report.

Graphical results showing the calculated critical surfaces and factors of safety for various cross-sections are presented in Appendix B (Figure B-11 through Figure B-14), with the factors of safety also summarized in Table 3-1. As can be seen in the Table, the calculated static factors of safety under the long-term, maximum storage pool loading condition for the various potential critical sections are all at least 1.50. In the case of this unit, the maximum surcharge pool is essentially the same as the long-term maximum storage pool; consequently, separate factors of safety for the maximum surcharge pool were not calculated. The calculated seismic (pseudo-dynamic) factors of safety for all cross-sections are at least 1.00. As such, we consider this unit stable with respect to global slope stability.

Liquefaction analyses were performed using the methods of Youd et al. (2001) for granular layers located below the existing groundwater table (nominally located at a depth of 28 to 30 feet below the crest of the embankments). Test hole data representing these layers is presented in our original stability assessment report titled, "IPP Coal Combustion Waste Ponds, Geotechnical Stability Analysis Report," prepared for IPSC by Gerhart Cole Inc., and dated April 2013. The seismic analysis event was obtained from the modal event from the deaggregation previously referenced with regards to slope stability, corresponding to ground motions with a 2% probability of exceedance (i.e., 98% probability of non-exceedance) in 50 years. This event has a moment magnitude of 5.5 at a distance of about 11 km.

The minimum calculated factor of safety against triggering liquefaction was 1.6, corresponding to conditions near the southern embankment near a depth of about 41 feet. This factor of safety is greater than minimum 1.2 value required. It should be recognized that as performed, this analysis does not take into account the geologic age of the deposits at the critical depth; doing so would likely result in even a larger factor of safety. As such, we consider this unit stable with respect to potential liquefaction.

3.5 WASTE WATER BASIN – HYDROLOGIC AND HYDRAULIC CAPACITY [257.82(c)]

For the low hazard potential classification of this unit, the inflow design flood is a 100-year event. However, as stated previously, this unit is an "off-channel" structure which is built substantially above surrounding grade which only receives meteoric water and the water that is pumped into it. The unit does not receive runoff from adjoining areas. As such, there is no inflow design flood control system.

Per NOAA Atlas 14, Volume 1, Version 5 (data server), the precipitation event near Delta, Utah, corresponding to a 100-year, 24-hour event is 1.97 inches. Given the area of the basin (about 53 acres) together with the minimal additional contributing area presented by adjoining roads along the crests of the embankment, we believe that this impoundment unit can readily accommodate this precipitation within the 3-foot freeboard volume available, and thus meets the intent of 257.82 requirements.

Table 3-1 Summary of Slope Stability Analysis Results – Waste Water Basin

Scenario / Location	Figure No.	Factor of Safety	
		Static	Seismic
Northwest Corner of Waste Water Basin	B-11,B-12	5.35	2.57
South Embankment of Waste Water Basin	B-13,B-14	3.86	2.12

4.1 COMBUSTION BY-PRODUCT LANDFILL – GENERAL

The CCR landfill, referred to as the Combustion By-Product Landfill, consists of approximately 271 acres with a nearly square footprint (see Figure 1-1). It is surrounded by the "Ash Truck Haul Road." The landfill is informally divided into seven sections running north-south, each being approximately 480 feet wide. Sections are numbered 1 through 7, starting from east to west. The landfill area has been unevenly utilized, with a vast majority of the landfilled CCR material located in Sections 1 through 5, as well as the south part of 6, reaching a height of approximately 40 to 60 feet above the surrounding (original) grade in the eastern portions of the landfill. Side slopes of the landfill vary from approximately 1.3H:1V along the active west face to approximately 4 to 5H:1V along the non-active (but not closed) south, east, and north faces.

The landfill is isolated from the surrounding area by (listed in order of distance away from the landfilled CCR materials) the Ash Truck Haul Road, a drainage/containment channel, another perimeter road, and an exterior berm. The roads and channel are unpaved. The typical geometry of the drainage channel may be approximated as a trapezoid, being typically 4 feet deep, at least 12 feet wide at the base, and with nominal 1.5H:1V side slopes. The exterior berm is typically at least 4 to 6 feet tall and isolates the drainage channel and landfill facility from the surrounding area.

The natural slope in the vicinity of the site is approximately 0.5 to 1% down to the west and north. The drainage channel typically follows this grade. At the northwest corner of the landfill, there is the Landfill Run-off Basin into which the perimeter drainage channels from the south and east discharge. This lined basin has an approximate storage capacity of 30 acre-feet, excluding freeboard.

The surrounding area land cover may generally be described as desert shrub with a poor degree of density. Native soils in the general area are largely mapped by the USDA/SCS (U.S. Soil Conservation Service, now known as the Natural Resources Conservation Service [NRCS]) as "Yenrab-Uffens complex (0 to 10% slopes)" with a lesser part of "Yenrab fine sand". The former unit is considered to be a combination of hydrologic groups A and C, whereas the latter is hydrologic group A. Of the four possible groups of A through D, group A soils are considered to present the lowest runoff potential, and include deep sands with very little silt and clay as well as deep rapidly permeable gravel. Group C soils present a moderately high runoff potential, and include shallow soils and soils containing considerable clay and colloids with below average infiltration potential after saturation.

Per 257.81, the run-on/run-off evaluation event is a 24-hour, 25-year storm. Per NOAA Atlas 14, Volume 1, Version 5 (data server), an event near Delta, Utah, corresponding to 24-hour, 25-year storm produces 1.61 inches of precipitation. It should be noted that a historic record-breaking rainfall event occurred in Delta and at the Plant on August 17 to 18, 2021. Various news outlets, citing the National Weather Service, reported that more than 4 inches of rainfall occurred in the area over a 24-hour period. Although the rain gauge at the Plant was not operational at the time, NOAA condition mapping based on radar data indicate that at least 2 inches of rain fell over the Plant during the 24-hour period of August 18. It should be noted that the bulk of the storm occurred during the evening of August 17 through about 5 am August 18, so the 24-hour rainfall at the Plant was certainly well in excess of 2 inches. It is readily apparent that Plant facilities experienced a run-on/run-off event much greater than the specified evaluation event.

4.2 COMBUSTION BY-PRODUCT LANDFILL – RUN-ON CONTROL [257.81(c)]

The run-on control plan consists of isolating the landfill unit from the surrounding area, thereby preventing run-on. The landfill unit is configured such that the CCR material is placed at or above the surrounding grade. The landfill area and perimeter drainage channel are also isolated from the relatively level surrounding area by the exterior perimeter berm. Any precipitation excess is forced around the landfill area. Consequently, run-on of flow onto the CCR unit during peak discharge from the evaluation storm event is not anticipated. Also, there were no observed occurrences of any appreciable run-on to the Combustion By-Product Landfill during the historic August 17-18, 2021 storm event.

4.3 COMBUSTION BY-PRODUCT LANDFILL – RUN-OFF CONTROL [257.81(c)]

The run-off control plan consists of using the perimeter drainage channel to control precipitation run-off. As stated previously, the landfill is configured such that run-off is intercepted by the perimeter drainage channel and then conveyed to the Landfill Run-off Basin. To evaluate run-off from the landfill, a SCS-based curve number (CN) and unit hydrograph approach has been used. Based on the nature of the CCR material when placed in the landfill, we have conservatively estimated the curve number to be 96, much like a dirt road or an artificial western desert landscape with a weed barrier and minimal granular cover. The calculated total runoff from the landfill under this scenario for the evaluation storm is about 27.1 acre-feet. This is less than the storage capacity of the Landfill Run-off Basin. Based on reported observations of the Landfill Run-off Basin during the historic August 17-18, 2021 storm event, the runoff reaching the basin was appreciable less than 27.1 acre-feet, despite the significantly greater amount of precipitation. This occurrence is believed to be attributable to the conservative nature of the calculated value as well as the extremely dry (drought) antecedant soil moisture conditions. Consequently, it is our opinion that the Landfill Run-off Basin provides adequate run-off control, satisfying 257.81(c) requirements.

With respect to capacity of the drainage channel, based on a conservative Manning’s ‘n’ value of 0.045, the calculated maximum carrying capacity is approximately 330 to 460 cfs for slopes ranging from 0.5 to 1%. In considering the potential sensitivity of the results to channel parameters, we note that reducing the channel depth from 4 to 2 feet, results in a capacity of about 95 to 135 cfs (which as shown below still proves to be adequate relative to 257.81(c) requirements).

Using common methods of estimating time of concentration for sheet flow, shallow concentrated flow, and channel flow (where overland flow is assumed to occur from the mid-point of the landfill, and channel length is based on the point furthest from the run-off basin), the calculated time of concentration for routing is approximately 40 minutes. Using the median temporal storm distribution (general precipitation area) from NOAA Atlas 14, Volume 1, Version 5 (data server), the 1975/1986 SCS triangular unit hydrograph approach with K=484 produces a calculated peak runoff of approximately 22 cfs when all flow is routed to a single conveyance. Supporting calculations are provided in Appendix D. Again, in consideration of the sensitivity of calculations, halving the time of concentration leads to less than a 20% increase in the peak runoff rate. We also note that increasing Manning's coefficient from 0.048 to 0.08 to account for a greater degree of vegetation in the channel (which could occur over time) changes channel capacity in an inversely proportional manner. Even in the event of such an occurrence, calculated channel capacity proves to be adequate relative to demand. On the other hand, increased amounts of vegetation in the channel would lead to increases in the time of concentration, thereby attenuating (i.e., lowering) the peak discharge demand.

It should be recognized that in reality, the landfill is served by at least two different conveyances – the portion of the drainage channel extending east from the run-off basin along the north and then east sides of the landfill, and the other portion of the drainage channel extending south from the run-off basin along the west and then south sides of the landfill; thus the calculated flow rate demand is conservative as it relates to evaluations of channel capacity.

Based on reported observations of the drainage channels at the Combustion By-Product Landfill during the historic August 17-18, 2021 storm event, runoff was captured and controlled by the channels, despite precipitation greatly exceeding that of the evaluation event. It was observed post-storm that some localized erosion (rilling) of landfill and drainage channel slide slopes has occurred. However, such is not expected to compromise performance; the relatively minor amounts of eroded material were retained by the perimeter road at the base of the landfill slopes or within the drainage channels themselves. The quantity of materials involved do not appear to have appreciably affected channel capacity.

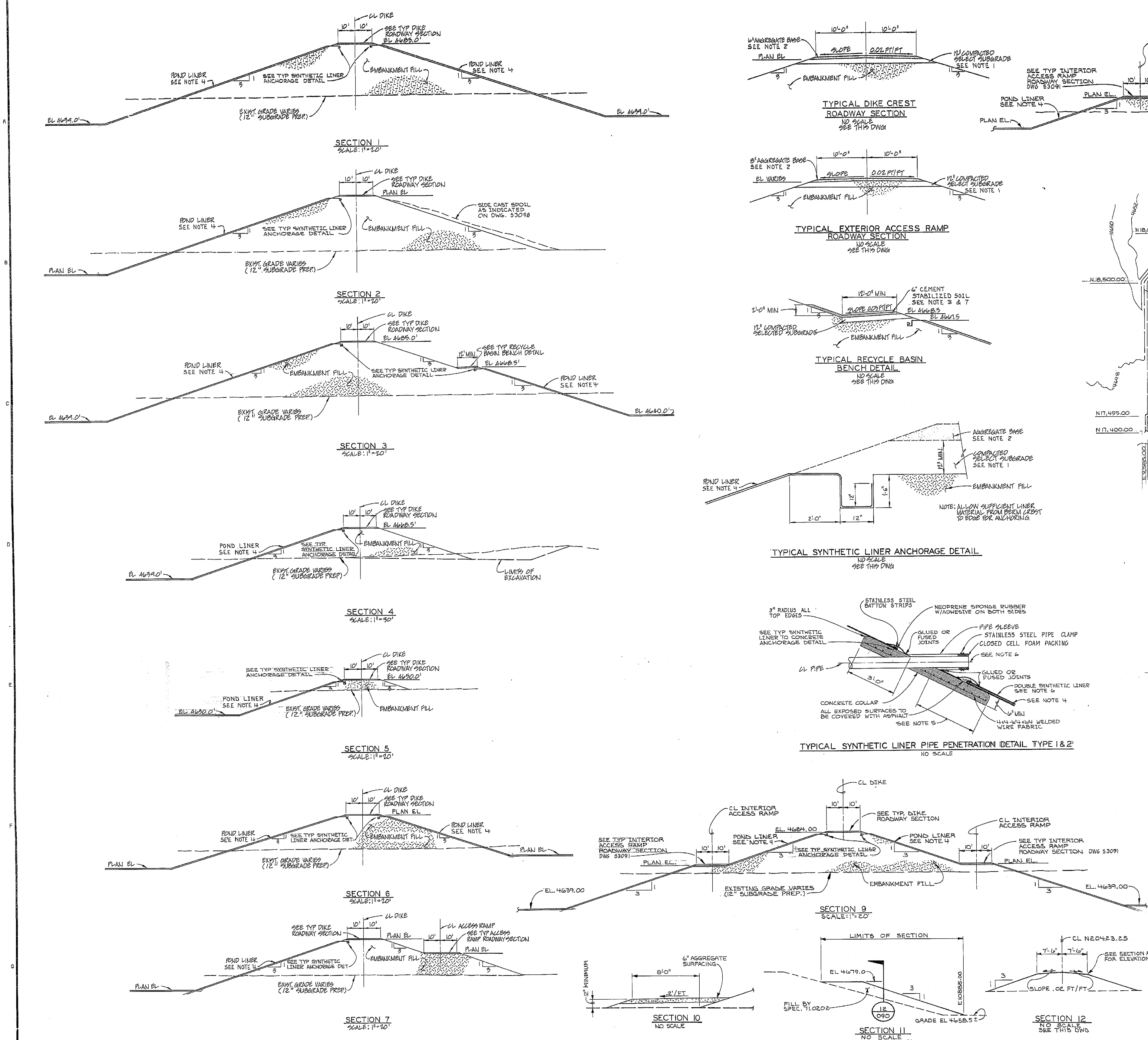
Given the calculated peak carrying capacity of the drainage channel is greater than the calculated peak run-off, we are of the opinion that that the run-off control system is adequate to contain the water volume resulting from the evaluation storm. This conclusion is substantiated by the observed performance of plant facilities during the historic August 17-18, 2021 storm event in which no run-off was observed to leave the Combustion By-Product Landfill area.

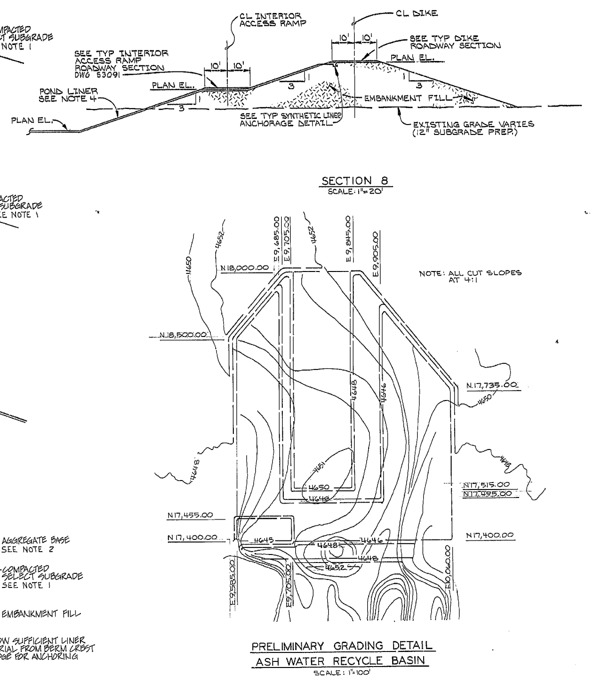
5.1 LIMITATIONS

The assessments and recommendations presented in this document are based on limited field studies and laboratory testing, as well as our understanding of the project's design, manner of construction, operation, and maintenance. If conditions are found later that are different from those described, we should be notified immediately so that we can make revisions as necessary.

This document was prepared solely for the use of the addressee (our Client) and may not contain sufficient information for other parties or uses.

We represent that our services are performed within the limitations prescribed by our Client, in a manner consistent with the level of care and skill ordinarily exercised by other professional consultants under similar circumstances. No other representation, expressed or implied, and no warranty or guarantee is included or intended. We do not assume responsibility for the accuracy of information provided by others.





GENERAL NOTES

1. 12" COMPACTED SELECT SUBGRADE TO BE PLACED UNDER CONTRACT 71.0202.
2. AGGREGATE BASE TO BE PLACED UNDER CONTRACT 71.0202.
3. CEMENT STABILIZED SOIL TO BE PLACED UNDER CONTRACT 71.0202.
4. ALL POND LINERS EXCEPT FOR ONSITE RESERVOIR TO BE INSTALLED UNDER CONTRACT 71.0206. ONSITE RESERVOIR LINER SHALL BE INSTALLED UNDER CONTRACT 71.0207 IF A SYNTHETIC LINER IS SELECTED BY THE OWNER. ONSITE RESERVOIR LINER SHALL BE INSTALLED UNDER CONTRACT 71.0202 IF A CLAY LINER IS SELECTED BY THE OWNER.
5. EXTEND CONCRETE COLLAR TO TOE OF DIKE FOR TYPE 2 PIPE PENETRATION.
6. COLLAR AND DOUBLE SYNTHETIC LINER SHALL EXTEND THREE FEET EITHER SIDE OF PIPE FOR TYPE 1 AND 2 DISCHARGE PIPE. DOUBLE LINER SHALL EXTEND TEN FEET PAST TOE OF SLOPE. ANCHORAGE DETAILS FOR DOUBLE SYNTHETIC LINER SHALL BE AS DETAILED BY LINER SUPPLIER.
7. SOIL-CEMENT SHALL CONSIST OF 10 PERCENT CEMENT BY WEIGHT.

REGISTERED PROFESSIONAL ENGINEER No. 5454 Burford L. McCorkle STATE OF UTAH

REV 3 11-9-84 ISSUED FOR CONST SPEC 71.0206 71.0202
REV 2 8-17-84 ISSUED FOR BIDS SPEC 71.0206
REV 2 2-28-84 ISSUED FOR CONST SPEC 71.0202, 71.0207
REV 1 12-2-83 ISSUED FOR BIDS SPEC 71.0207
REV 1 11-23-83 ISSUED FOR ADDENDUM 1 SPEC 71.0202
REV 0 11-1-83 ISSUED FOR BIDS SPEC 71.0202

NO.	DATE	REVISIONS AND RECORD OF ISSUE	BY	CHK	APP	FLM
4	6-30-87	CONFORMED TO CONSTRUCTION RECORDS	BD	BLM		
3	11-9-84	ECN 026/71.0202 & APPROVED FOR CONST SPEC 71.0206		GVR	BLM	
2	2-28-84	REVISED & APPROVED FOR CONST SPEC 71.0202, 71.0207		GVR	BLM	
1	11-23-83	ADDED EXR DETAIL, NOTE 7, & DIMENSIONS	LEN		LAH	
0	11-1-83	INITIAL ISSUE	GVR		BLM	

SCALE: AS NOTED

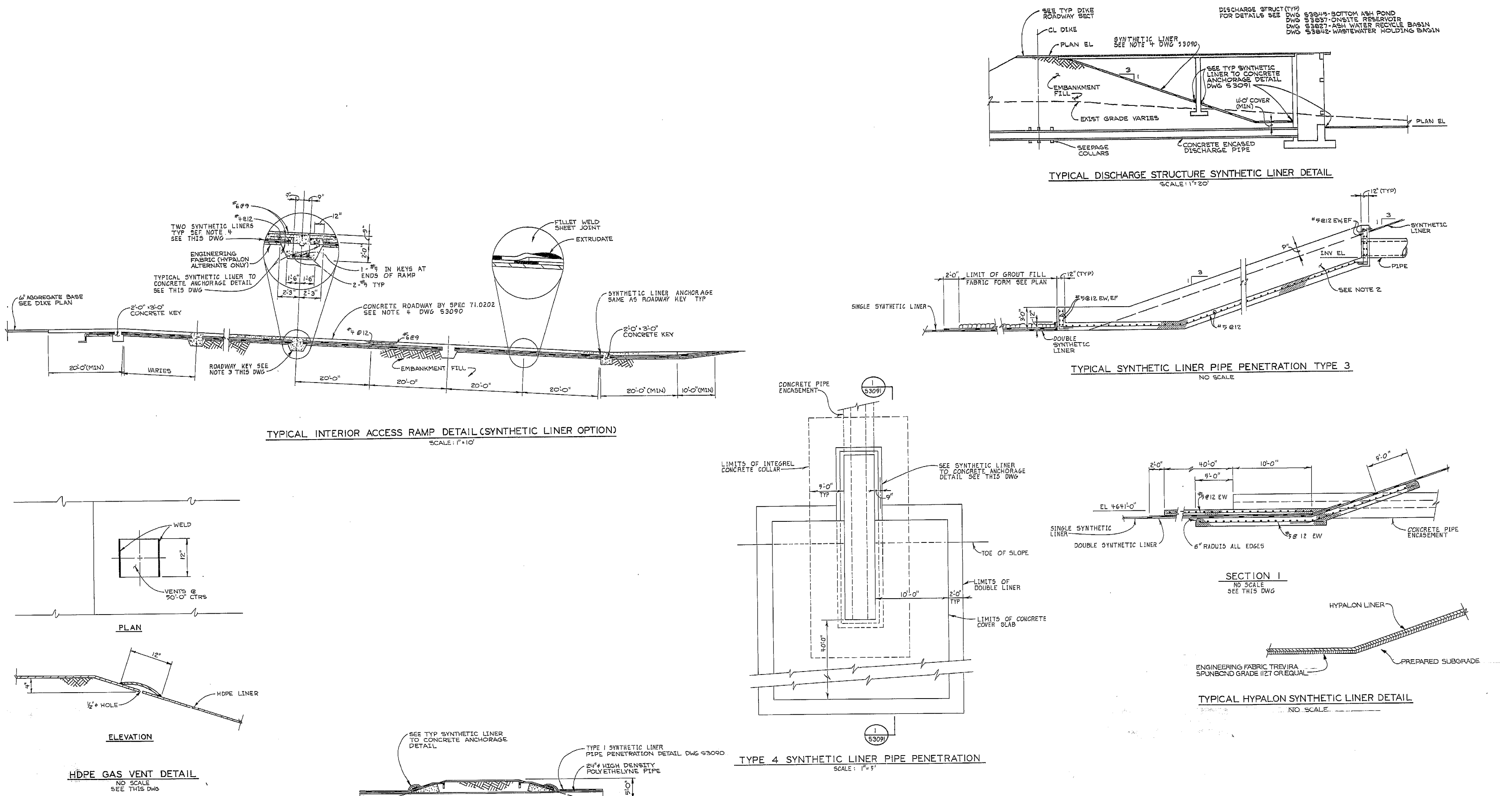
I HEREBY CERTIFY THAT THIS DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF UTAH
SIGNED B L McCorkle
DATE 11-1-83 REG NO. 5454

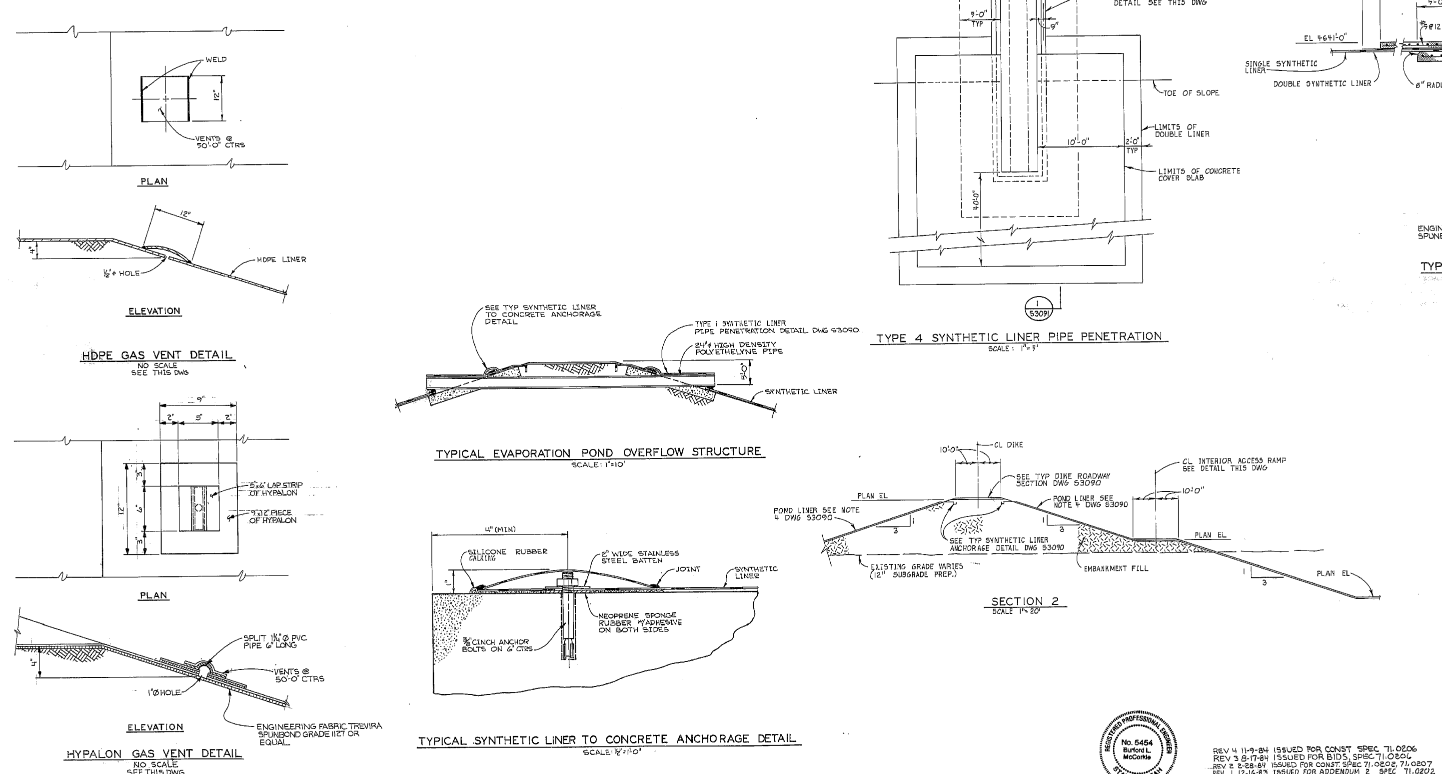
BLACK & VEATCH CONSULTING ENGINEERS
ENGINEER | DRAWN WML
CHECKED GVR | DATE 2-28-84

IPP INTERMOUNTAIN POWER PROJECT

PONDS AND EMBANKMENTS
SECTIONS AND DETAILS

PROJECT 9255 | DRAWING NUMBER 9STU-S3090 | REV 4
CODE
AREA





NOTES

1. SEE DWG S3090 FOR GENERAL NOTES.
2. TYPE 3 PENETRATION SHALL EXTEND THREE FEET EITHER SIDE OF THE DISCHARGE PIPE.
3. THE CONCRETE ROADWAY SHALL BE INSTALLED IN TWO POURS. THE FIRST POUR SHALL CONSIST OF THE KEYS ONLY. THE SYNTHETIC LINER SHALL THEN BE PLACED ON THE RAMP AND ATTACHED TO THE KEYS. THE ROADWAY SURFACE SHALL BE POURED FOLLOWING THE INSTALLATION OF THE SYNTHETIC LINER.
4. IN ADDITION TO THE REQUIREMENTS OF THE TYPICAL ANCHORAGE DETAIL, THE HDPE SHEETS SHALL BE SEPARATED BY NEOPRENE SPONGE RUBBER WITH ADHESIVE ON BOTH SIDES. TWO LINES OF BATTEN STRIPS SHALL BE USED ON ALL FOUR SIDES OF THE KEY TRENCH ACHORAGE DETAIL.

REGISTERED PROFESSIONAL ENGINEER No. 5454 Burford L. McCorkle STATE OF UTAH

REV 4 11-9-84 ISSUED FOR CONST SPEC 71.0206
REV 3 8-17-84 ISSUED FOR BIDS, SPEC 71.0206
REV 2 2-28-84 ISSUED FOR CONST. SPEC 71.0202, 71.0207
REV 1 12-16-83 ISSUED FOR ADDENDUM 2 SPEC 71.0202
REV 0 12-2-83 ISSUED FOR BIDS SPEC 71.0207
REV 0 11-1-83 ISSUED FOR BIDS, SPEC. 71.0202

NO.	DATE	REVISIONS AND RECORD OF ISSUE	BY	CHK	APP	FLM
5	6-30-87	CONFORMED TO CONSTRUCTION RECORDS	BD		BLM	
4	11-9-84	APPROVED FOR CONST SPEC 71.0206	msh	GVR	BLM	
3	8-17-84	REVISED + ADDED DETAILS + NOTES 3,4	msh	GVR	BLM	
2	2-28-84	REVISED & APPROVED FOR CONST. SPEC 71.0202, 71.0207	msh	GVR	BLM	
1	12-16-83	ADDED DETAILS AND SECTIONS 1&2	LEN	GVR	BLM	
0	11-1-83	INITIAL ISSUE	GVR		BLM	

SCALE: AS NOTED

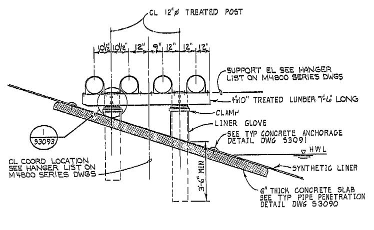
I HEREBY CERTIFY THAT THIS DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF UTAH
SIGNED B L McCorkle
DATE 11/1/83 REG NO. 5454

BLACK & VEATCH CONSULTING ENGINEERS
ENGINEER | DRAWN TAR
CHECKED GVR | DATE 2-28-84

IPP INTERMOUNTAIN POWER PROJECT

PONDS AND EMBANKMENTS
LINER DETAILS

PROJECT 9255 - DRAWING NUMBER 9STU-S3091 REV 5
CODE
AREA



BOTTOM ASH PIPE SUPPORT DETAIL LOOKING EAST
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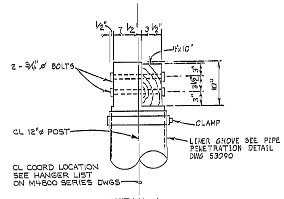

DETAIL 1
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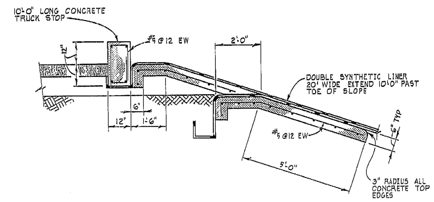

DETAIL 2
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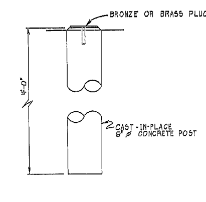
SEE DWG 53098



SETTLEMENT MONUMENT
NO SCALE

SETTLEMENT MONUMENT LOCATION*		
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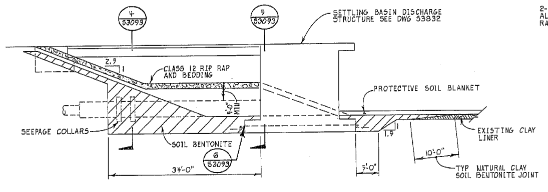
SM-1	15,017	19,080
SM-2	14,080	19,449
SM-3	13,141	18,500
SM-4	13,500	17,490
SM-5	14,285	18,000
SM-6	22,410	7,323
SM-7	20,190	6,329
SM-8	20,190	8,299
SM-9	17,961	7,323
SM-10	20,455	9,780
SM-11	19,320	10,809
SM-12	19,320	8,759
SM-13	18,176	9,780
SM-14	17,490	9,780

* SEE NOTES BELOW



SETTLING BASIN STRUCTURE DIKE INTERFACE
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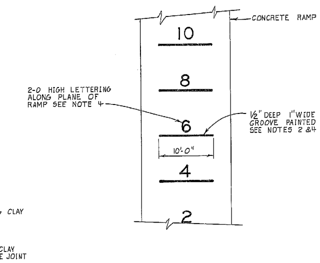

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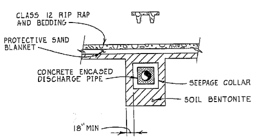
SEE NOTE 2



SECTION 4
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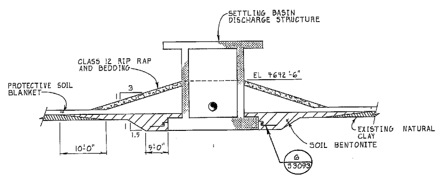

SECTION 5
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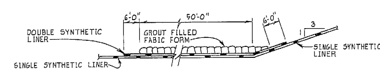

BOTTOM ASH POND GROUT FILLED FABRIC FORM DETAIL
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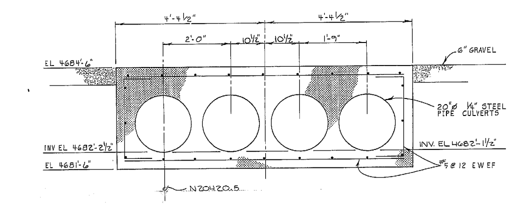
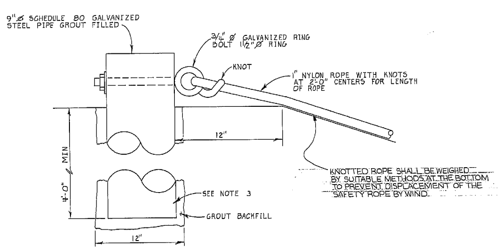


BOTTOM ASH CULVERT DETAIL LOOKING WEST
(3 REQUIRED)
NO SCALE



SAFETY ROPE DETAIL
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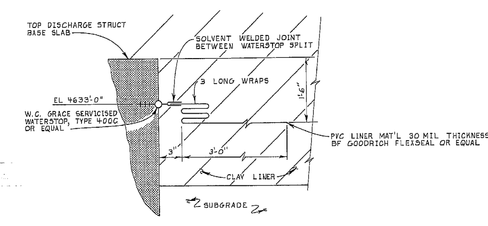

DETAIL 6
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SEE THIS DWG

NOTES

1. SEE DWG 53090 FOR GENERAL NOTES
2. GRIND GROOVE AND PAINT DEPTH LEVEL EVERY 2'-0" CHANGE IN VERTICAL ELEVATION.
3. SAFETY ROPES AT 100 FEET SPACING CENTERED BETWEEN GAS VENTS ON PERIMETER OF ALL SYNTHETIC LINED PONDS. INSTALLED BY CONTRACT 71.0206.
4. PAINT SHALL BE A MIN 10 MILS OF CARBOLINE 195 SURFACER BELOW 8 MILS OF WHITE CARBOLINE PHENOLINE 300 FINISH BACKGROUND. THE NUMBERS SHALL BE PAINTED WITH A MIN OF 8 MILS OF CARBOLINE PHENOLINE 302, BLACK.
5. MONUMENTS SHALL BE LOCATED ON EDGE OF AGGREGATE SURFACED ROADS, AS AS CLOSE AS POSSIBLE TO LISTED COORDINATES.
6. MONUMENTS SHALL BE INSTALLED AS SOON AS POSSIBLE FOLLOWING COMPLETION OF EACH RESPECTIVE EMBANKMENT TO PROPERLY MONITOR SETTLEMENT.
7. THE ELEVATION OF EACH MONUMENT SHALL BE ESTABLISHED TO THE NEAREST 0.01 FT.
8. THE CONTRACTOR SHALL SUBMIT FINAL LOCATIONS AND ELEVATIONS OF ALL MONEMENTS TO THE CONSTRUCTION MANAGER.

REGISTERED PROFESSIONAL ENGINEER No. 5454 Burford L. McCorkle STATE OF UTAH

REV 5 11-9-84 ISSUED FOR CONST SPEC 71.0206
REV 4 8-29-84 ISSUED TO CONTR 71.0202
REV 3 8-17-84 ISSUED FOR BIDS, SPEC 71.0206
~~REV 2~~ 2-28-84 ISSUED FOR CONSTRUCTION SPEC. 71.0202, 71.0207
REV 1 12-16-83 ISSUED FOR ADDENDUM 2 SPEC 71.0202
REV 0 11-23-83 ISSUED FOR ADDENDUM 1 SPEC 71.0202
REV 0 12-2-83 ISSUED FOR BIDS SPEC 71.0207

NO.	DATE	REVISIONS AND RECORD OF ISSUE	BY	CHK	APP	FLM
6	6-30-87	CONFORMED TO CONSTRUCTION RECORDS	BD		BLM	
5	11-9-84	APPROVED FOR CONST SPEC 71.0206	MSY	GVR	BLM	
4	8-29-84	REVISED ASH PIPE SUPPORT DETAIL & DETAIL 1	MSY	GVR	BLM	
3	8-17-84	ECN 022/71.0202, REVISED & ADDED DETAILS, NOTES	MSY	GVR	BLM	
2	2-28-84	REVISED & APPROVED FOR CONST. SPEC 71.0202, 71.0207	MSY	GVR	BLM	
1	12-16-83	ADDED DETAILS AND NOTES	LEN	GVR	BLM	
0	11-23-83	INITIAL ISSUE	LEN		[illegible]	

SCALE:

I HEREBY CERTIFY THAT THIS DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF UTAH
SIGNED B L McCorkle
DATE 11-23-83 REG NO. 5454

BLACK & VEATCH CONSULTING ENGINEERS
ENGINEER GVR DRAWN LEN
CHECKED GVR DATE 2-28-84

IPP INTERMOUNTAIN POWER PROJECT

PONDS AND EMBANKMENTS
LINER DETAILS

PROJECT 9255 - DRAWING NUMBER 9STU-S3093 REV 6

CODE
AREA

P-GN-240R
50434

from borrow areas as necessary. After preparation of the fill or embankment site, the subgrade shall be scarified, leveled, and rolled so that surface materials of the subgrade will be compact and well bonded with the first layer of the fill or embankment. All material deposited in fills and embankments shall be free from rocks or stones, brush, stumps, logs, roots, debris, and organic or other objectionable materials. Fills and embankments shall be constructed in horizontal layers not exceeding 8 inches in uncompacted thickness. Material deposited in piles or windrows by excavating and hauling equipment shall be spread and leveled prior to compaction.

Each layer shall be thoroughly compacted. The compacted density of each layer shall be at least 90 per cent of the maximum density within a range of ±2 per cent of optimum moisture content as determined by ASTM D1557. If the material fails to meet the density specified, compaction methods shall be modified as required to attain the specified density.

2A.10 BORROW AREAS. Material necessary to complete fills and embankments shall be excavated from borrow areas and hauled to the fill or embankment site. Borrow material will be available on the Owner's property.

The location, size, shape, depth, drainage, and surfacing of all borrow areas shall be acceptable to the Construction Manager. Borrow areas shall be regular in shape, with finish graded surfaces when completed. Side slopes shall not be steeper than three horizontal to one vertical and shall be uniform for the entire length of any one side.

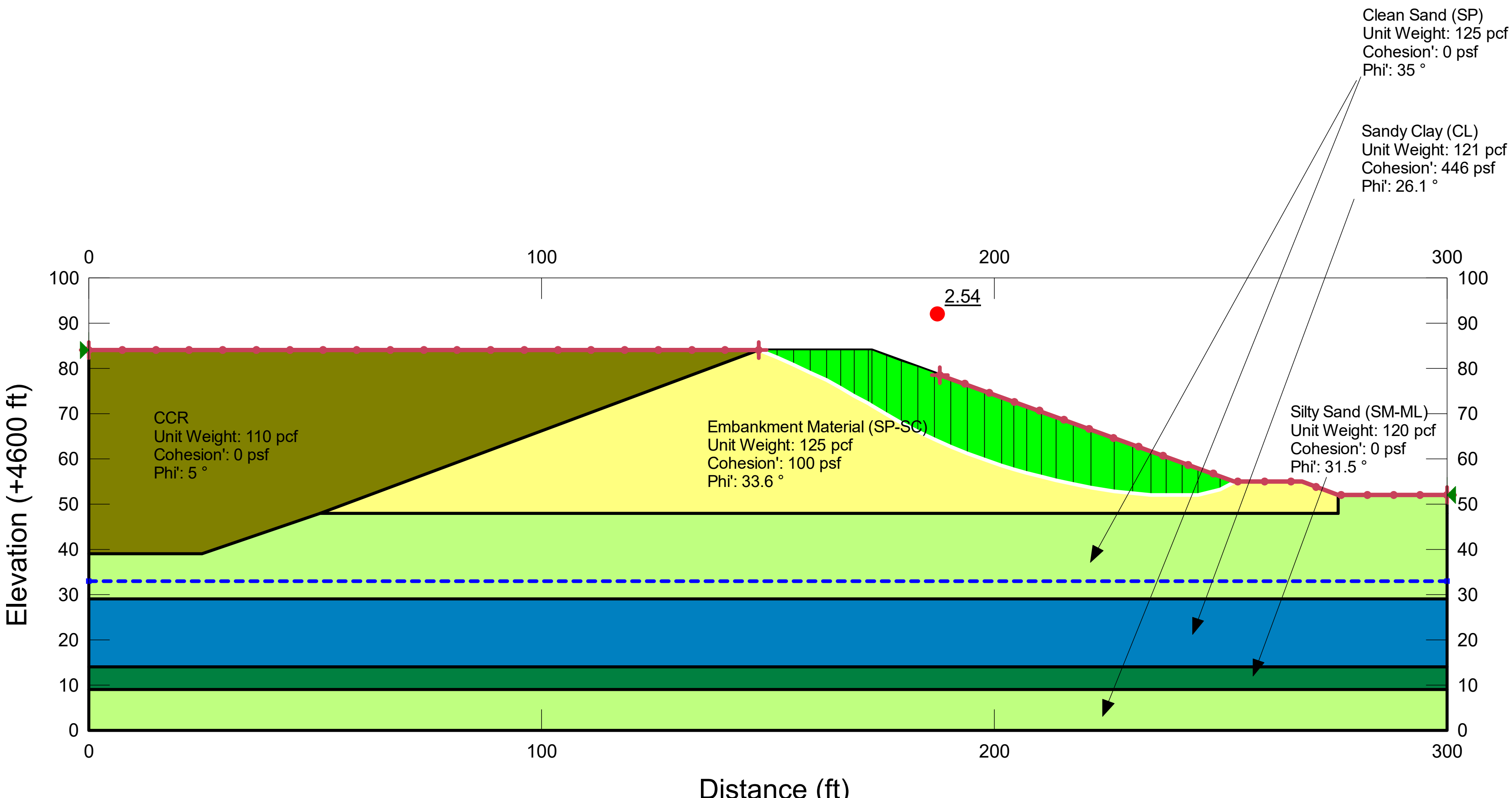
2A.11 MAINTENANCE AND RESTORATION OF FILLS AND BACKFILLS. Fills and backfills that settle or erode before final acceptance of the work, and pavement, structures, and other facilities damaged by such settlement or erosion, shall be repaired. The settled or eroded areas shall be refilled, compacted, and graded to conform to the elevation indicated on the drawings or to the elevation of the adjacent ground surface. Damaged facilities shall be repaired in a manner acceptable to the Construction Manager.

Earth slopes of the roads and parking areas constructed under these specifications shall be maintained to the lines and grades indicated on the drawings until the final acceptance of the roads and parking areas.

2A.12 GRADING TO ESTABLISH FINAL GRADES. All areas of the site shall be graded as required to establish the final grade elevations as indicated on the drawings. The grading shall be finished to the contours and elevations indicated on the drawings or, if not indicated, to the matching contours and elevations of the original, undisturbed ground surface. The final grading shall provide smooth uniform surfacing and effective drainage of the ground areas.

Intermountain Power Plant CCR Assessment

Cross-section: North Embankment of Bottom Ash Basin
Static Limit Equilibrium Analysis

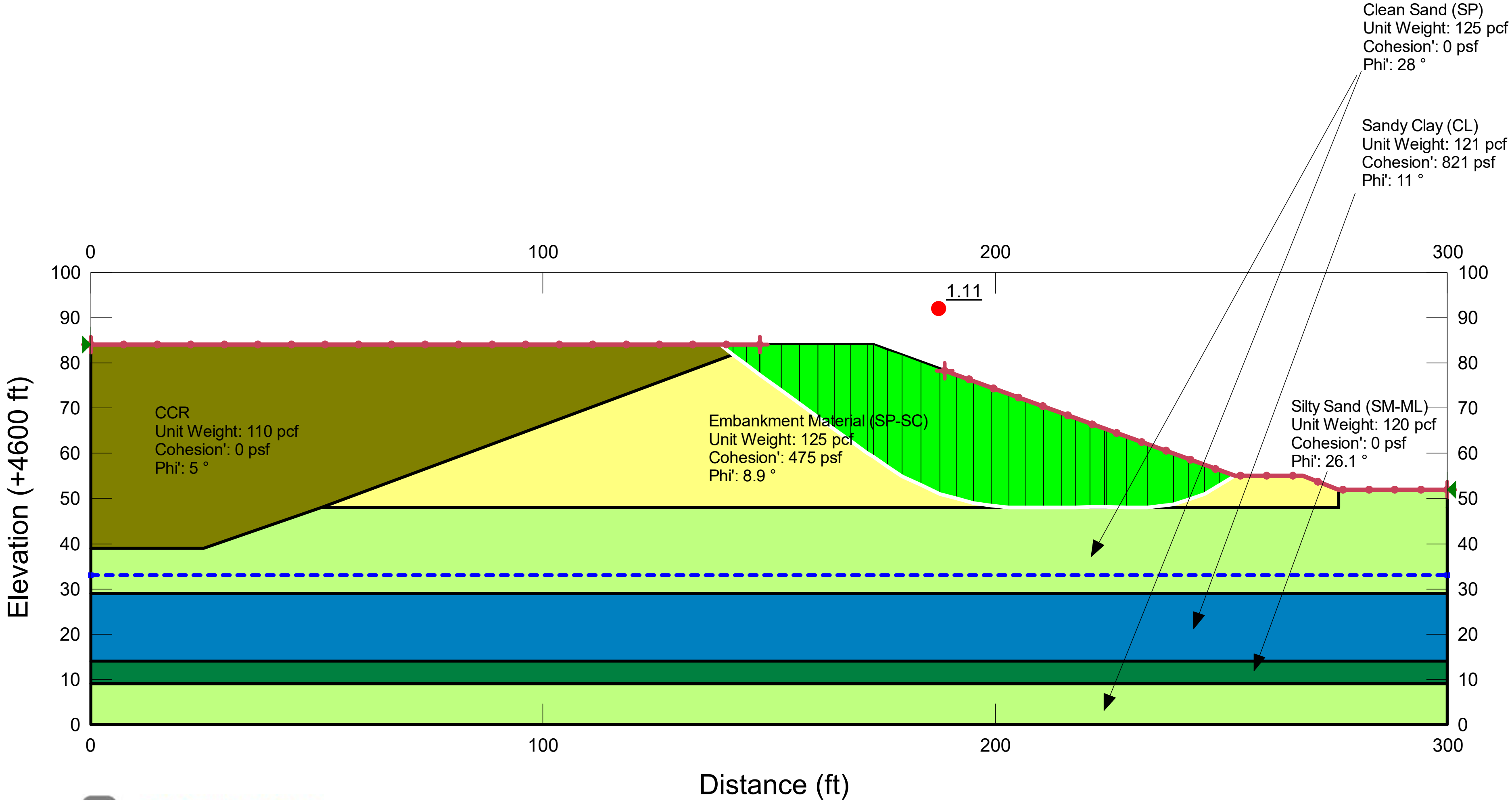


GERHART COLE

Figure B-1

Intermountain Power Plant CCR Assessment

Cross-section: North Embankment of Bottom Ash Basin
Pseudo-Dynamic Limit Equilibrium Analysis

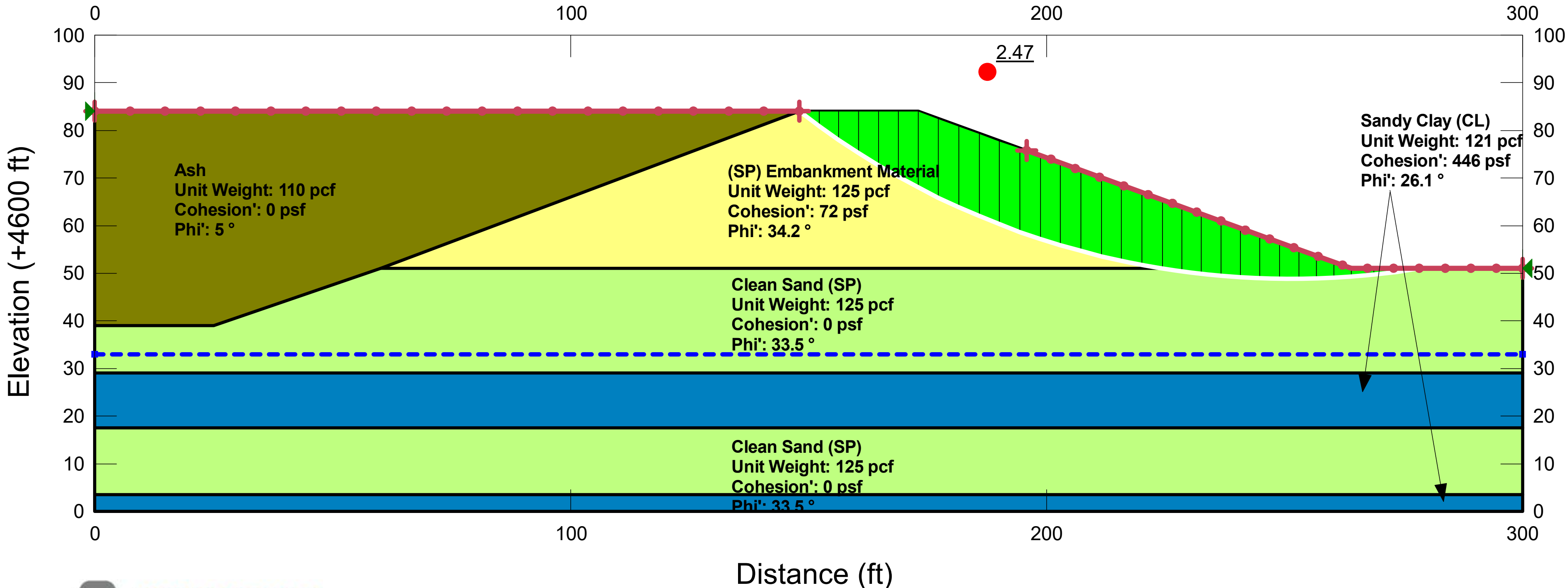


GERHART COLE

Figure B-2

Intermountain Power Plant CCR Assessment

Cross-section: Southeast Corner of Bottom Ash Basin
Static Limit Equilibrium Analysis

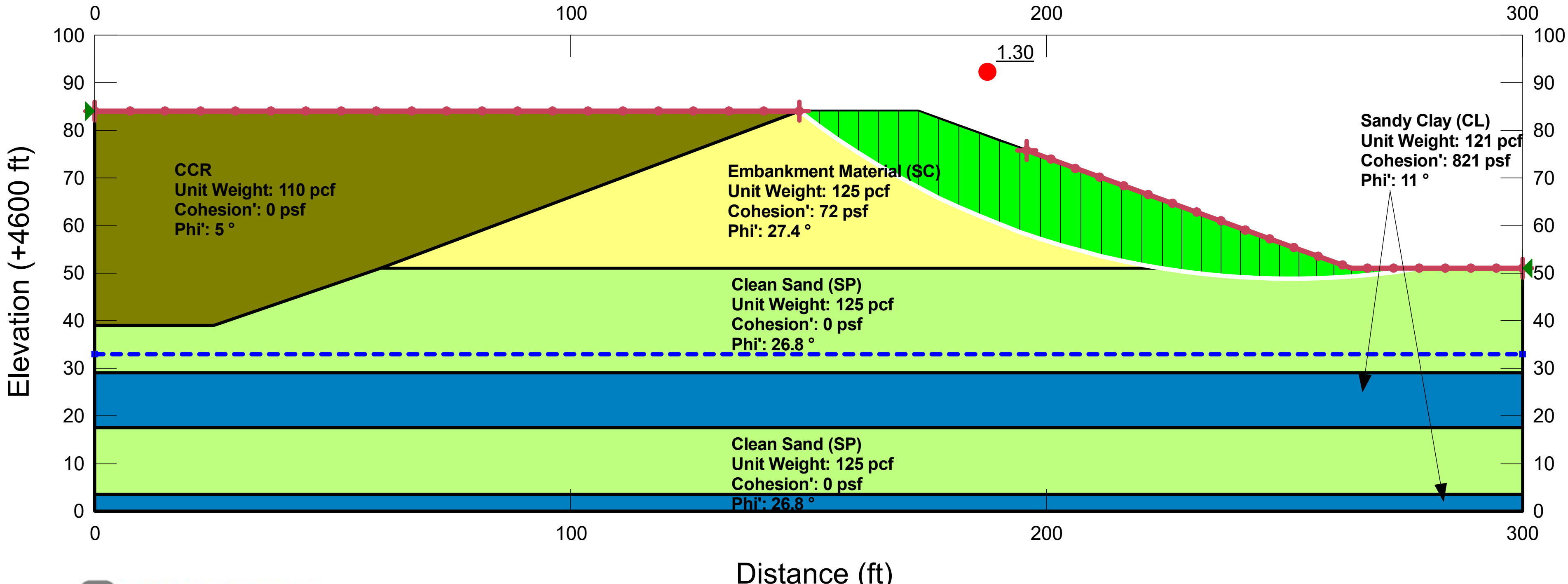


GERHART COLE

Figure B-3

Intermountain Power Plant CCR Assessment

Cross-section: Southeast Corner of Bottom Ash Basin
Pseudo-Dynamic Limit Equilibrium Analysis



GERHART COLE

Figure B-4

Intermountain Power Plant CCR Assessment

Cross-section: Southeast Corner of Bottom Ash Basin / South Embankment
Static Limit Equilibrium Analysis

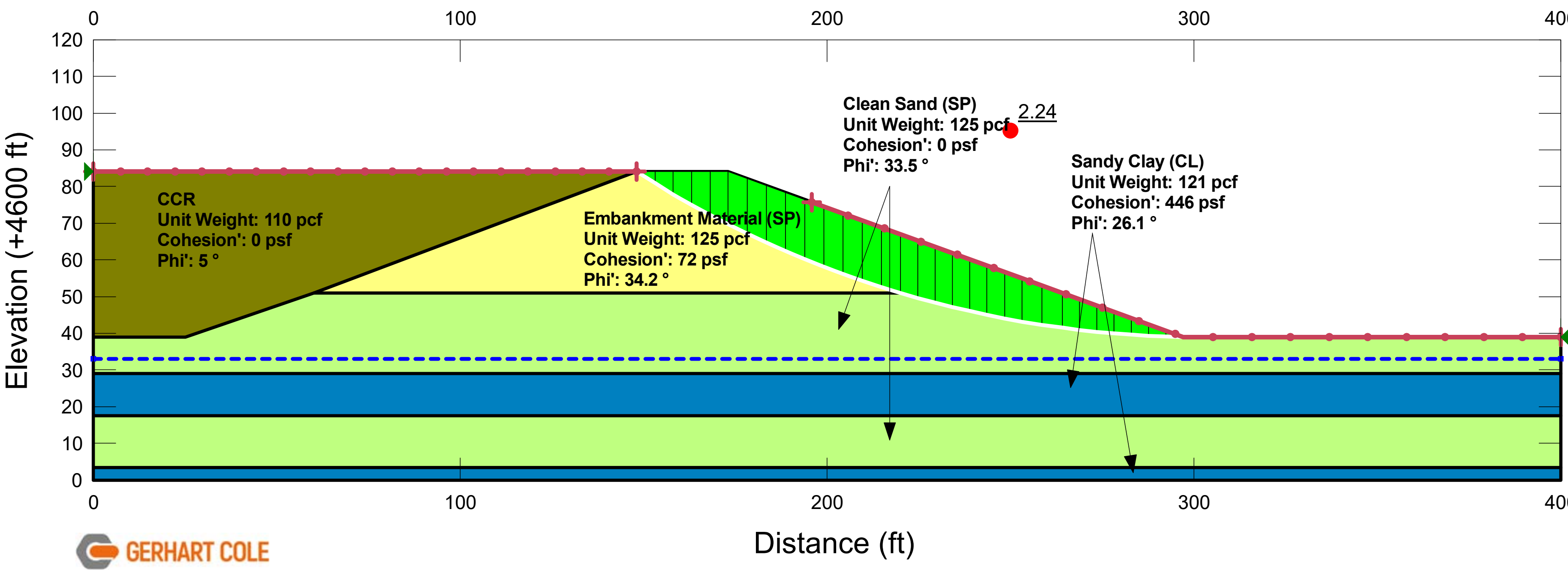


Figure B-5

Intermountain Power Plant CCR Assessment

Cross-section: Southeast Corner of Bottom Ash Basin / South Embankment
Pseudo-Dynamic Limit Equilibrium Analysis

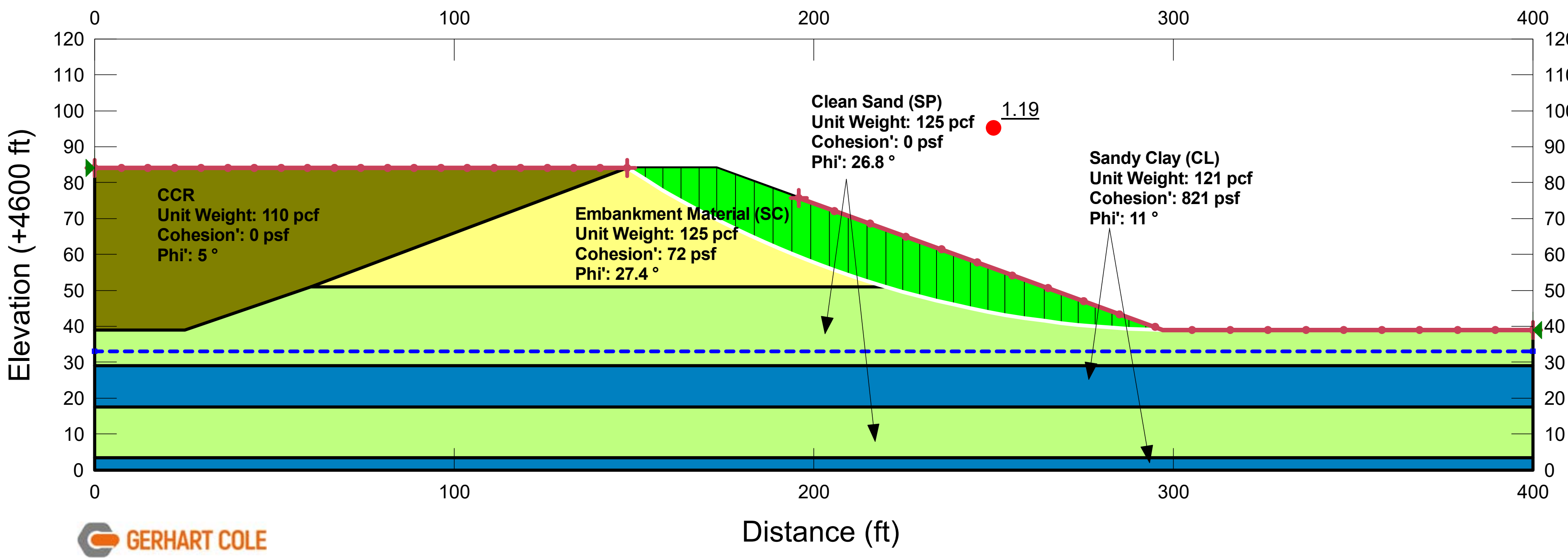
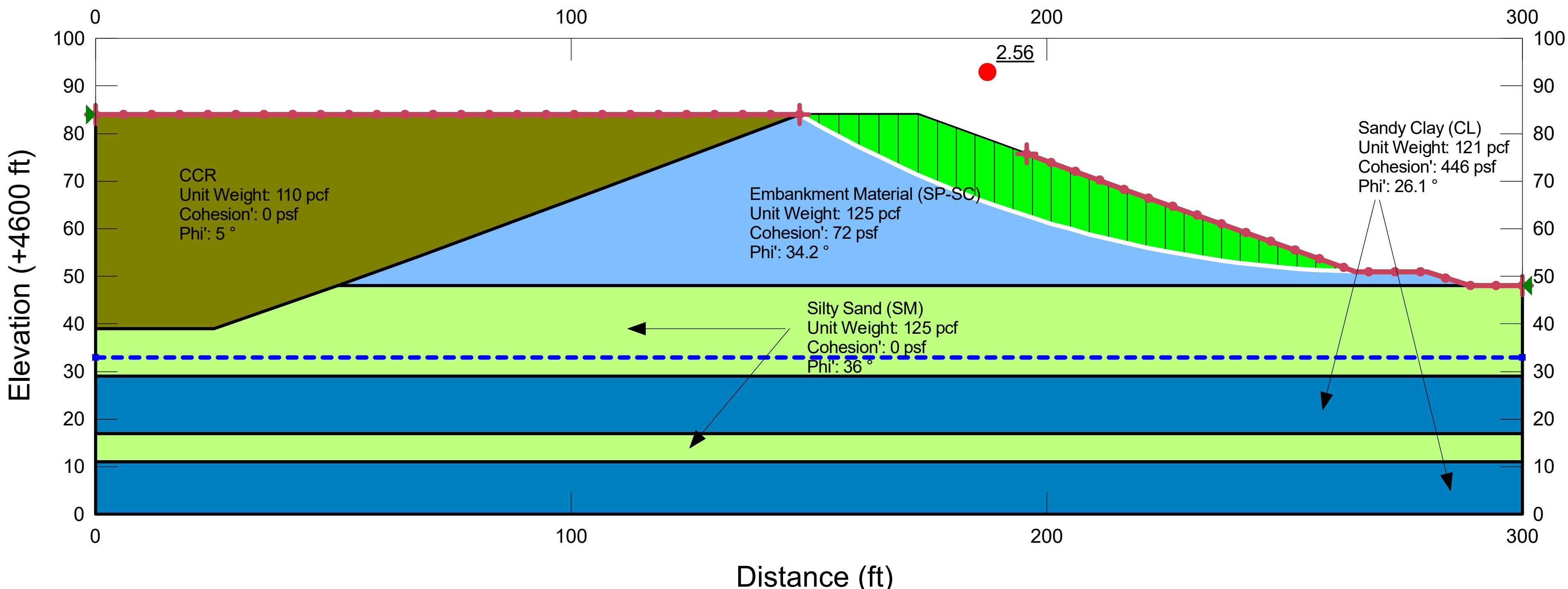


Figure B-6

Intermountain Power Plant CCR Assessment

Cross-section: Southwest Corner of Bottom Ash Basin
Static Limit Equilibrium Analysis

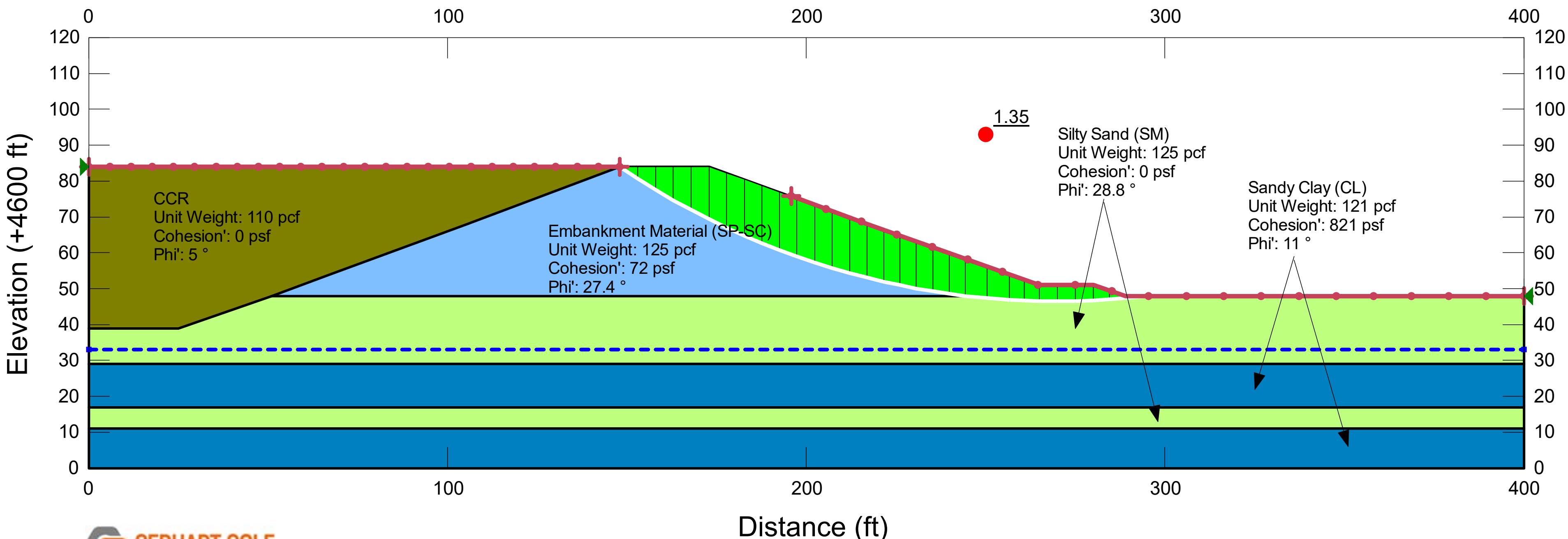


GERHART COLE

Figure B-7

Intermountain Power Plant CCR Assessment

Cross-section: Southwest Corner of Bottom Ash Basin
Pseudo-Dynamic Limit Equilibrium Analysis



GERHART COLE

Figure B-8

Intermountain Power Plant CCR Assessment

Cross-section: Southwest Corner of Bottom Ash Basin / South Embankment
Static Limit Equilibrium Analysis

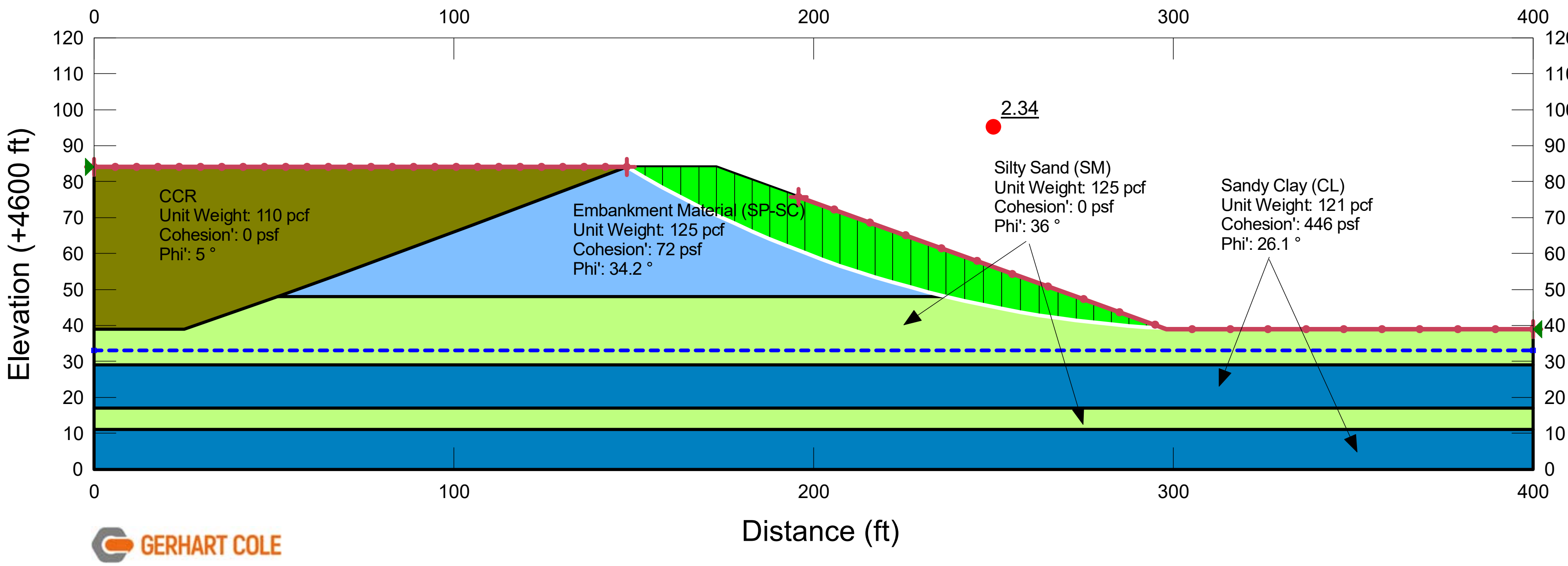


Figure B-9

Description: Intermountain Power Plant CCR Assessment

Cross-section: Southwest Corner of Bottom Ash Basin / South Embankment
Pseudo-Dynamic Limit Equilibrium Analysis

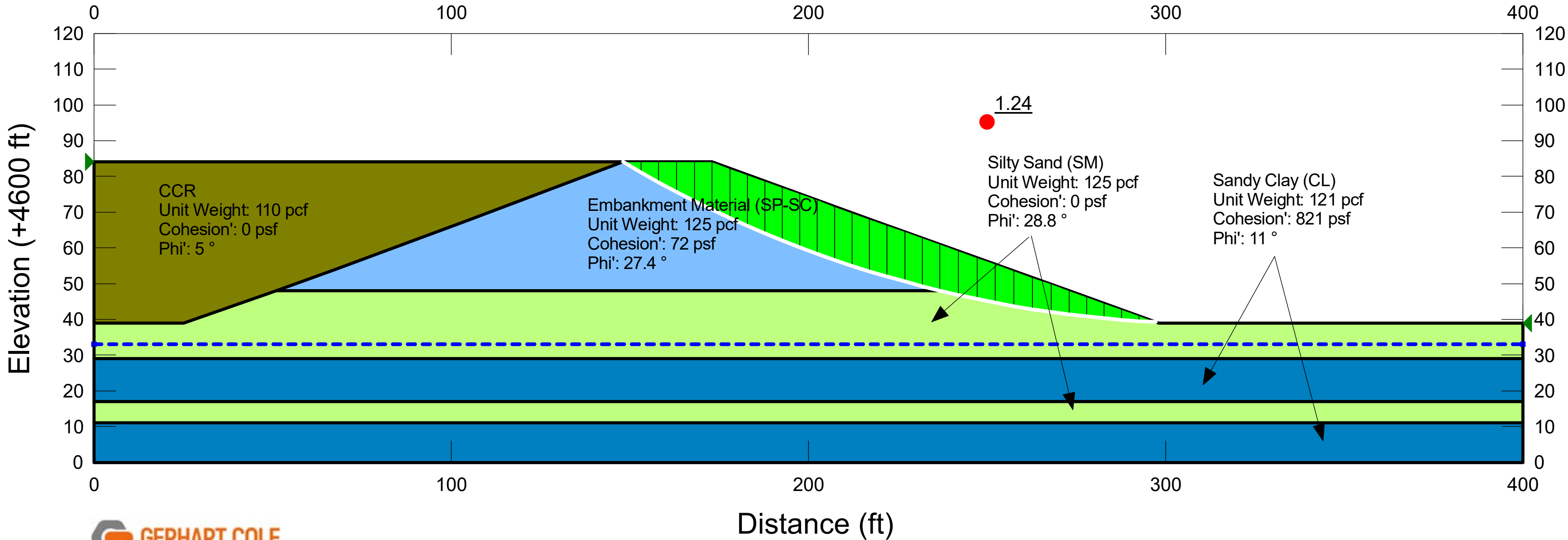


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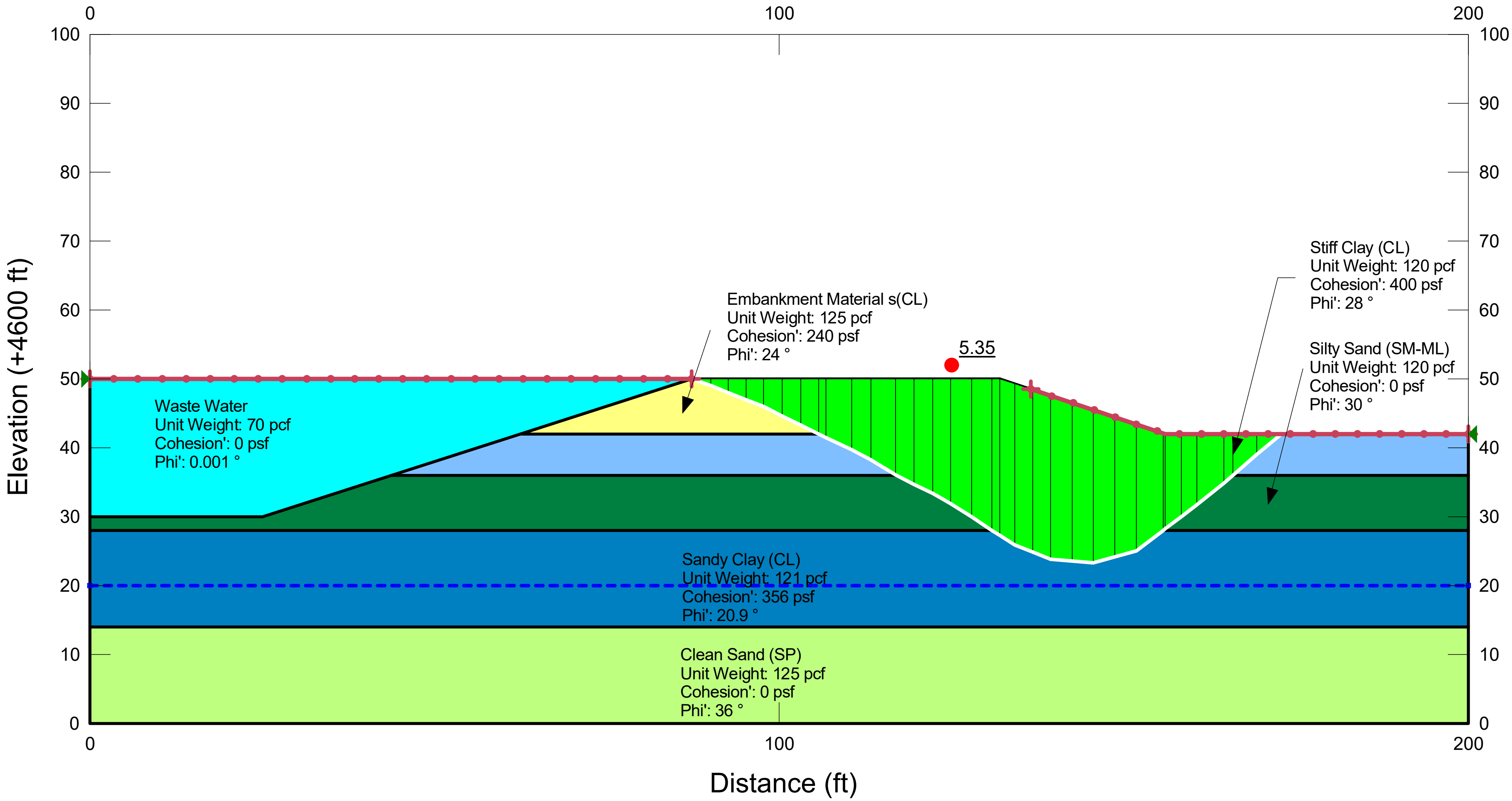
Figure B-10

Intermountain Power Plant CCR Assessment

Cross-section: Northwest Corner of Waste Water Basin
Static Limit Equilibrium Analysis

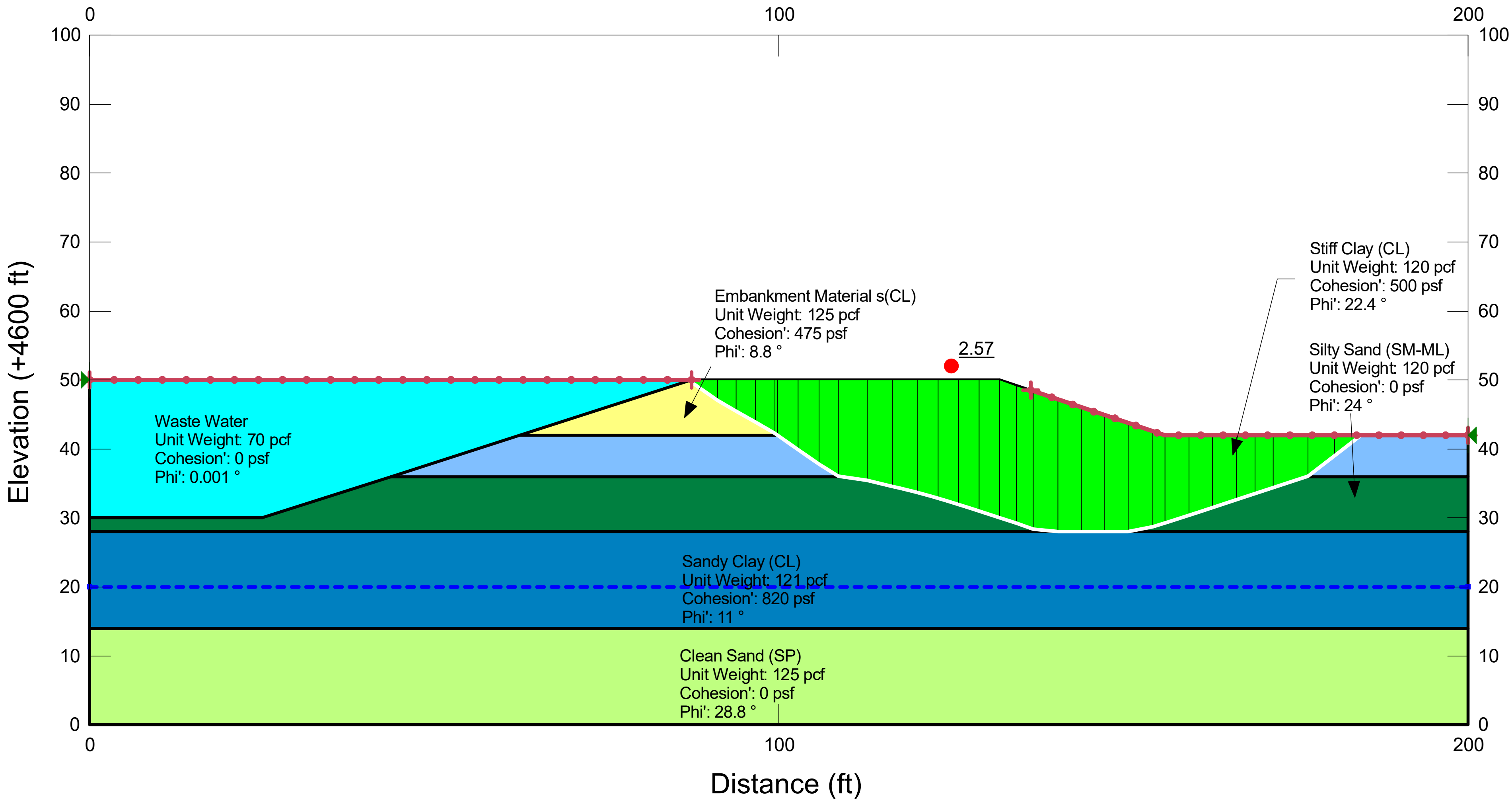


GERHART COLE

Figure B-11

Description: Intermountain Power Plant CCR Assessment

Cross-section: Northwest Corner of Waste Water Basin
Pseudo-Dynamic Limit Equilibrium Analysis

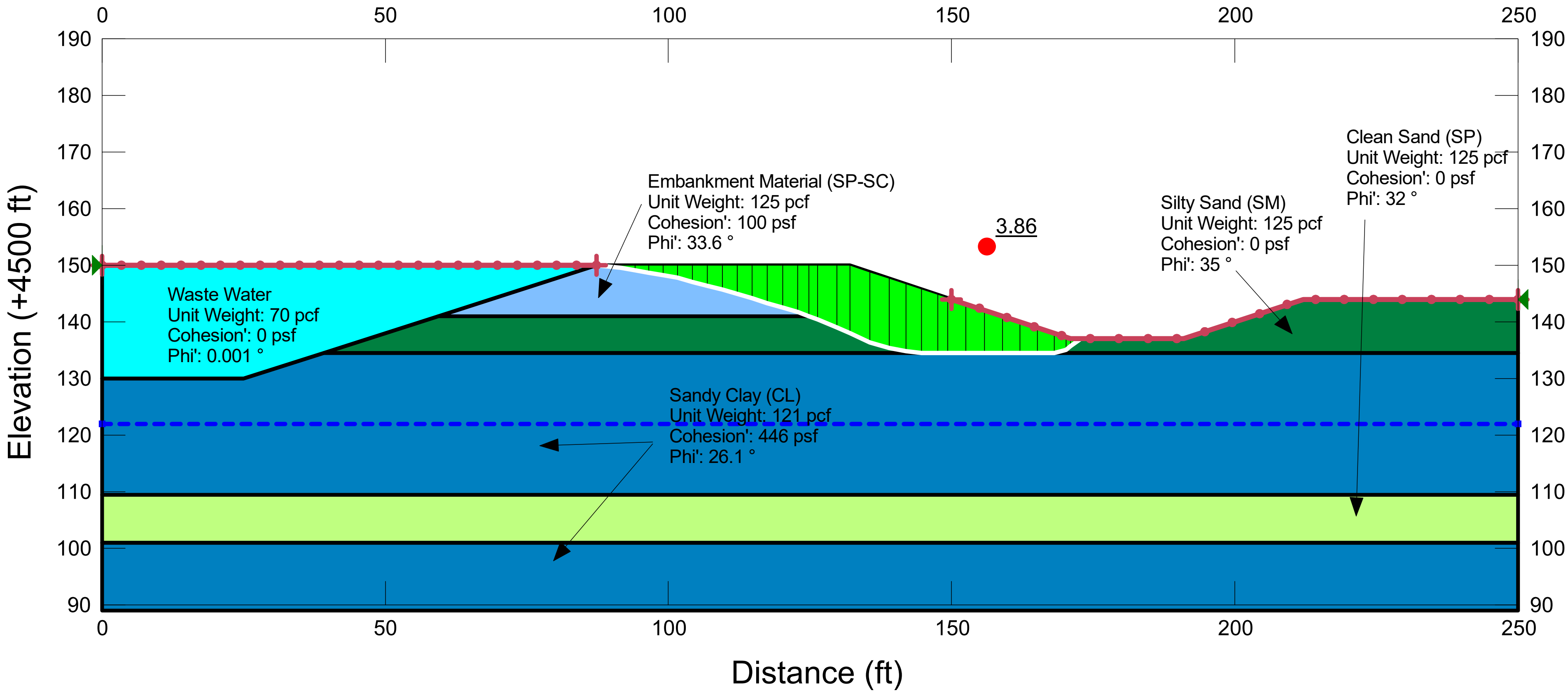


GERHART COLE

Figure B-12

Intermountain Power Plant CCR Assessment

Cross-section: South Embankment of Waste Water Basin
Static Limit Equilibrium Analysis

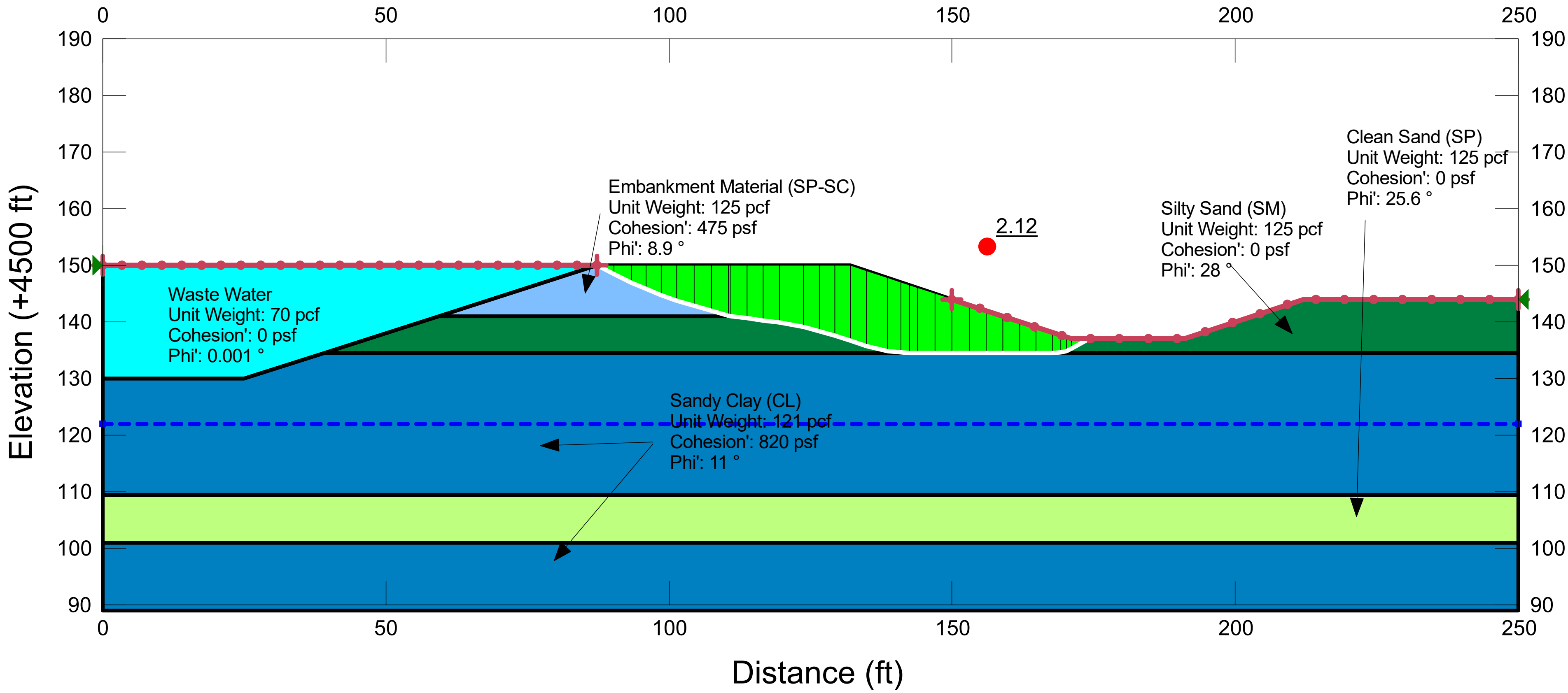


GERHART COLE

Figure B-13

Intermountain Power Plant CCR Assessment

Cross-section: South Embankment of Waste Water Basin
Pseudo-Dynamic Limit Equilibrium Analysis



GERHART COLE

Figure B-14

Bottom Ash Basin Capacity Table

Contour Elevation	Water Depth	Volume in Acre Feet
4684	47	3421
4682	45	3124
4680	43	2929
4678	41	2744
4676	39	2561
4674	37	2383
4672	35	2210
4670	33	2041
4668	31	1877
4666	29	1718
4664	27	1564
4662	25	1414
4660	23	1268
4658	21	1127
4656	19	990
4654	17	858
4652	15	729
4650	13	606
4648	11	486
4646	9	371
4644	7	260
4642	5	153
4640	3	50
4637	0	0

Waste Water Basin Capacity Table

Contour Elevation	Water Depth	Volume in Acre Feet
4650	22	917
4649	21	866
4648	20	815
4647	19	765
4646	18	716
4645	17	667
4644	16	618
4643	15	570
4642	14	522
4641	13	474
4640	12	427
4639	11	380
4638	10	334
4637	9	287
4636	8	242
4635	7	197
4634	6	152
4633	5	108
4632	4	64
4631	3	28
4630	2	8.5
4629	1	1.3
4628	0	0

Rainfall Excess

CN	**96**
Precip (in)	**1.61**
Duration (hr)	**24**
Area (ac)	**271**
(mi^2)	0.4234375
S' (in)	0.4166667

Increment	Time (hr)	Duration (%)	Precip (%)	Cumulative Precip (in)	Cumulative Excess, R (in)	Incremental Excess, R (in)	Cumulative Excess (ac-ft)	Instantaneo Excess (in/hr)	Cumulative Infiltration (in)
0	0	0	0	0	0	0	0	0	0
1	0.5	2.0833333	2.5	0.04025	0	0	0	0	0.04025
2	1	4.1666667	5	0.0805	0	0	0	0	0.0805
3	1.5	6.25	7.375	0.1187375	0.0027727	0.0027727	0.0626167	0.0055454	0.1159648
4	2	8.3333333	9.6666667	0.1556333	0.0106905	0.0079178	0.2414267	0.0158356	0.1449429
5	2.5	10.416667	11.958333	0.1925292	0.0226746	0.0119841	0.5120684	0.0239683	0.1698546
6	3	12.5	14.25	0.229425	0.0379253	0.0152507	0.8564795	0.0305014	0.1914997
7	3.5	14.583333	16.541667	0.2663208	0.0558396	0.0179143	1.2610434	0.0358285	0.2104813
8	4	16.666667	19.5	0.31395	0.082165	0.0263255	1.85556	0.0526509	0.231785
9	4.5	18.75	22.625	0.3642625	0.1131331	0.0309681	2.5549231	0.0619362	0.2511294
10	5	20.833333	25.416667	0.4092083	0.1430149	0.0298818	3.229753	0.0597635	0.2661934
11	5.5	22.916667	27.708333	0.4461042	0.1688431	0.0258283	3.813041	0.0516565	0.277261
12	6	25	30	0.483	0.1956718	0.0268287	4.4189224	0.0536574	0.2873282
13	6.5	27.083333	32.604167	0.5249271	0.2272096	0.0315378	5.131151	0.0630756	0.2977174
14	7	29.166667	35.1875	0.5665188	0.2594517	0.0322421	5.8592841	0.0644841	0.3070671
15	7.5	31.25	37.53125	0.6042531	0.2894212	0.0299695	6.5360962	0.0599391	0.3148319
16	8	33.333333	39.916667	0.6426583	0.3205401	0.0311189	7.2388637	0.0622377	0.3221182
17	8.5	35.416667	42.520833	0.6845854	0.3551404	0.0346003	8.0202539	0.0692006	0.329445
18	9	37.5	45.125	0.7265125	0.3903204	0.03518	8.8147355	0.07036	0.3361921
19	9.5	39.583333	47.777778	0.7692222	0.4266847	0.0363643	9.6359624	0.0727286	0.3425375
20	10	41.666667	50.555556	0.8139444	0.4652688	0.0385842	10.507321	0.0771683	0.3486756
21	10.5	43.75	53.333333	0.8586667	0.5043136	0.0390447	11.389082	0.0780895	0.3543531
22	11	45.833333	55.958333	0.9009292	0.541589	0.0372754	12.230884	0.0745508	0.3593402
23	11.5	47.916667	58.354167	0.9395021	0.5758992	0.0343103	13.005724	0.0686205	0.3636029
24	12	50	60.75	0.978075	0.6104602	0.034561	13.786227	0.069122	0.3676148
25	12.5	52.083333	63.145833	1.0166479	0.6452505	0.0347903	14.571908	0.0695806	0.3713974
26	13	54.166667	65.541667	1.0552208	0.680251	0.0350004	15.362334	0.0700009	0.3749699
27	13.5	56.25	67.791667	1.0914458	0.7132971	0.0330461	16.108626	0.0660922	0.3781488
28	14	58.333333	69.944444	1.1261056	0.745063	0.0317659	16.826006	0.0635318	0.3810426
29	14.5	60.416667	72.097222	1.1607653	0.7769632	0.0319002	17.546418	0.0638004	0.3838021
30	15	62.5	74.25	1.195425	0.8089885	0.0320253	18.269656	0.0640506	0.3864365
31	15.5	64.583333	76.402778	1.2300847	0.8411306	0.0321421	18.995532	0.0642842	0.3889541
32	16	66.666667	78.555556	1.2647444	0.8733819	0.0322513	19.723875	0.0645026	0.3913625
33	16.5	68.75	80.708333	1.2994042	0.9057355	0.0323536	20.454526	0.0647071	0.3936687
34	17	70.833333	82.75	1.332275	0.9365079	0.0307724	21.149469	0.0615448	0.3957671
35	17.5	72.916667	84.625	1.3624625	0.9648399	0.028332	21.7893	0.056664	0.3976226
36	18	75	86.5	1.39265	0.9932368	0.0283969	22.430597	0.0567938	0.3994132
37	18.5	77.083333	88.375	1.4228375	1.0216953	0.0284585	23.073285	0.0569169	0.4011422
38	19	79.166667	90.25	1.453025	1.0502122	0.0285169	23.717292	0.0570338	0.4028128
39	19.5	81.25	91.75	1.477175	1.0730658	0.0228536	24.233403	0.0457073	0.4041092
40	20	83.333333	93	1.4973	1.0921366	0.0190708	24.664086	0.0381417	0.4051634
41	20.5	85.416667	94.25	1.517425	1.1112304	0.0190938	25.095286	0.0381875	0.4061946
42	21	87.5	95.5	1.53755	1.1303463	0.0191159	25.526988	0.0382319	0.4072037
43	21.5	89.583333	96.75	1.557675	1.1494837	0.0191374	25.959175	0.0382748	0.4081913
44	22	91.666667	97.5	1.56975	1.1609762	0.0114925	26.218713	0.022985	0.4087738
45	22.5	93.75	98.125	1.5798125	1.1705589	0.0095827	26.435122	0.0191654	0.4092536
46	23	95.833333	98.75	1.589875	1.1801466	0.0095877	26.651644	0.0191754	0.4097284
47	23.5	97.916667	99.375	1.5999375	1.1897393	0.0095926	26.868278	0.0191853	0.4101982
48	24	100	100	1.61	1.1993368	0.0095975	27.085022	0.019195	0.4106632

Travel Time Calculations

Sheet Flow			
Manning's n (OVERLAND)	**0.011**		
P2 (in)	**0.98**		
S (%)	**1**		
s (ft/ft)	0.01		
Length (<=300) (ft)	**300**		
Tt (hr)	0.115957	Eq 3.3, TR-55 (1986)	
(min)	6.957407		
(sec)	417.4444		
Overland (shallow concentrated) Flow			
Unpaved coefficient	**16.1345**		
S (%)	**1**		
s (ft/ft)	0.01		
V (ft/s)	1.61345	Appendix F, TR-55 (1986)	
Length (ft)	**1380**		
Tl (hr)	0.237586	Eq 3.1, TR-55 (1986)	
(min)	14.25517		
(sec)	855.31		
Flow in Trapezoidal Channel			
Manning's n (CHANNEL)	**0.045**	**0.045**	
slope zH:1V	**1.5**	**1.5**	
b (ft)	**12**	**12**	
depth, y (ft)	**4**	**4**	
T	24	24	
A	72	72	
P	26.42221	26.42221	
R	2.724981	2.724981	
S (%)	**1**	**0.5**	
s (ft/ft)	0.01	0.005	
V (ft/s)	6.459755	4.567737	Eq 3.4, TR-55 (1986)
Q (cfs)	465.1024	328.877	
Length (ft)	**6875**	**6875**	(approx distance from basin to far corner of landfill area)
Tl (hr)	0.295634	0.418089	Eq 3.1, TR-55 (1986)
(min)	17.73803	25.08536	
(sec)	1064.282	1505.122	
Tc (hr)	0.649177	0.771632	
Tc (min)	38.95061	46.29794	

tc (hr) **0.6666667**

Lag Time = 0.6 x tc (hr) 0.4

Incremental Hydrograph #		1	2	3	4	5	6	7	8	9	10	11	12	Columns	37	38	39	40	41	42	43	44	45	46	47	48	
Increment	0	1	2	3	4	5	6	7	8	9	10	11	12	Omitted	37	38	39	40	41	42	43	44	45	46	47	48	
time (hr)	0	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	For	18.5	19	19.5	20	20.5	21	21.5	22	22.5	23	23.5	24	
Time to Peak, tp (hr)		0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	Printing	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	
Cum Time to Peak, tp (hr)		0.65	1.15	1.65	2.15	2.65	3.15	3.65	4.15	4.65	5.15	5.65	6.15	Purposes	18.65	19.15	19.65	20.15	20.65	21.15	21.65	22.15	22.65	23.15	23.65	24.15	
Excess, R (in)		0	0	0.0027727	0.0079178	0.0119841	0.0152507	0.0179143	0.0263255	0.0309681	0.0298818	0.0258283	0.0268287		0.0284585	0.0285169	0.0228536	0.0190708	0.0190938	0.0191159	0.0191374	0.0114925	0.0095827	0.0095877	0.0095926	0.0095975	
qp (cfs)		0	0	0.8742257	2.4964631	3.7785738	4.8085095	5.6483339	8.3003662	9.7641845	9.4216634	8.1435982	8.4590361		8.9729024	8.9913276	7.2057088	6.0129954	6.0202239	6.0272191	6.033991	3.6235558	3.0214009	3.022984	3.0245423	3.0260765	
	Total Time (hr)	q (cfs)	q (cfs)	q (cfs)	q (cfs)	q (cfs)	q (cfs)	q (cfs)	q (cfs)	q (cfs)	q (cfs)	q (cfs)	q (cfs)		q (cfs)	q (cfs)	q (cfs)	q (cfs)	q (cfs)	q (cfs)	q (cfs)	q (cfs)	q (cfs)	q (cfs)	q (cfs)	q (cfs)	Cumulative q (cfs)
	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0
	0.1	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0
	0.2	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0
	0.3	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0
	0.4	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0
	0.5	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0
	0.6	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0
	0.7	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0
	0.8	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0
	0.9	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0
	1	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0
	1.1	0	0	0.0413576	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0.0413576
	1.2	0	0	0.1479459	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0.1479459
	1.3	0	0	0.325481	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0.325481
	1.4	0	0	0.5473998	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0.5473998
	1.5	0	0	0.7457818	1.279E-16	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0.7457818
	1.6	0	0	0.8372393	0.1181019	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0.9553412
	1.7	0	0	0.8607761	0.4224784	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	1.2832545
	1.8	0	0	0.7827683	0.9294524	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	1.7122207
	1.9	0	0	0.667774	1.56317	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	2.2309439
	2	0	0	0.5413475	2.1296751	3.872E-16	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	2.6710225
	2.1	0	0	0.4418202	2.3908435	0.1787556	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	3.0114194
	2.2	0	0	0.3537252	2.458056	0.639451	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	3.4512321
	2.3	0	0	0.2797522	2.2352947	1.4067921	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	3.921839
	2.4	0	0	0.2259537	1.9069137	2.3659685	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	4.498836
	2.5	0	0	0.18157	1.5458868	3.2234141	9.856E-16	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	4.9508709
	2.6	0	0	0.143911	1.261674	3.6187111	0.2274795	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	5.2517756
	2.7	0	0	0.1114974	1.0101074	3.7204419	0.8137478	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	5.6557945
	2.8	0	0	0.089978	0.7988682	3.3832769	1.7902451	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	6.0623682
	2.9	0	0	0.0761441	0.6452397	2.8862491	3.0108667	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	6.6184996
	3	0	0	0.0642316	0.5184962	2.3398092	4.1020285	1.737E-15	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	7.0245654
	3.1	0	0	0.052319	0.4109562	1.9096331	4.6050726	0.2672096	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	7.2451906
	3.2	0	0	0.0404065	0.3183951	1.5288691	4.7345324	0.9558719	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	7.578075
	3.3	0	0	0.0302617	0.2569437	1.2091436	4.3054654	2.1029182	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	7.9047325
	3.4	0	0	0.0254198	0.2174392	0.976616	3.6729615	3.536726	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	8.4291625
	3.5	0	0	0.0205779	0.1834215	0.7847807	2.977577	4.8184633	3.403E-15	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	8.7848204
	3.6	0	0	0.0157361	0.1494037	0.6220114	2.4301467	5.4093659	0.3926712	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	9.019335
	3.7	0	0	0.0133151	0.115386	0.4819135	1.9455969	5.5614364	1.4046774	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	9.5223253
	3.8	0	0	0.0108942	0.086416	0.3889024	1.538723	5.0574313	3.0902902	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	10.172657
	3.9	0	0	0.0084733	0.0725895	0.3291096	1.2428148	4.3144581	5.1973062	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	11.164751
	4	0	0	0.0068593	0.0587629	0.2776214	0.9986904	3.4976221	7.0808509	4.003E-15	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	11.920407
	4.1	0	0	0.0055143	0.0449363	0.2261331	0.7915546	2.8545811	7.9491969	0.461921	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	12.333837
	4.2	0	0	0.0041694	0.0380231	0.1746449	0.6132699	2.2854028	8.1726683	1.6524005	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	12.940579
	4.3	0	0	0.0034431	0.0311098	0.1307968	0.4949066	1.8074668	7.4320202	3.635281	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	13.535024
	4.4	0	0	0.0033355	0.0241965	0.1098693	0.4188159	1.4598771	6.3402028	6.1138817	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	14.470179
	4.5	0	0	0.0032279	0.0195876	0.0889418	0.3532933	1.1731155	5.1398422	8.3296005	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	15.107609
	4.6	0	0	0.0031203	0.0157469	0.0680143	0.2877708	0.9298027	4.1948774	9.3510844	0.4457172	0	0		0	0	0	0	0	0	0	0	0	0	0	0	15.296134
	4.7	0	0	0.0030127	0.0119062	0.0575506	0.2222483	0.7203798	3.3584559	9.6139663	1.5944353	0	0		0	0	0	0	0	0	0	0	0	0	0	0	15.581955
	4.8	0	0	0.0029051	0.0098322	0.0470868	0.1664484	0.5813439	2.6561172	8.7427006	3.5077577	0	0		0	0	0	0	0	0	0	0	0	0	0	0	15.714192
	4.9	0	0	0.0027975	0.009525	0.0366231	0.1398167	0.4919637	2.1453254	7.4583348	5.8994108	0	0		0	0	0	0	0	0	0	0	0	0	0	0	16.183797
	5	0	0	0.0026899	0.0092177	0.0296473	0.1131849	0.4149974	1.7239222	6.0462835	8.0374036	0	0		0	0	0	0	0	0	0	0	0	0	0	0	16.377346
	5.1	0	0	0.0025823	0.0089105	0.0238341	0.0865532	0.3380311	1.366368	4.9346686	9.0230545	0.3852548	0		0	0	0	0	0	0	0	0	0	0	0	0	16.169257
	5.2	0	0	0.0024747	0.0086032	0.0180209	0.0732373	0.2610648	1.0586159	3.9507393	9.2767147	1.3781474	0		0	0	0	0	0	0	0	0	0	0	0	0	16.027618
	5.3	0	0	0.0023671	0.0082959	0.0148818	0.0599214	0.1955193	0.8542992	3.124539	8.4360124	3.0319243	0		0	0	0	0	0	0	0	0	0	0	0	0	15.72776
	5.4	0	0	0.0022595	0.0079887	0.0144167	0.0466056	0.1642362	0.7229528	2.5236662	7.1967013	5.0991454	0		0	0	0	0	0	0	0	0	0	0	0	0	15.777972
	5.5	0	0	0.0021519	0.0076814	0.0139517	0.0377283	0.1329531	0.6098489	2.027946	5.8341839	6.9471157	0		0	0	0	0	0	0	0	0	0	0	0	0	15.613561
	5.6	0	0	0.0020443	0.0073742	0.0134866	0.0303306	0.10167	0.496745	1.607335	4.7615637	7.7990614	0.4001775		0	0	0	0	0	0	0	0	0	0	0	0	15.219788
	5.7	0	0	0.0019367	0.0070669	0.0130215	0.0229329	0.0860285	0.3836411	1.2453091	3.8121499	8.0183121	1.4315292		0	0	0	0	0	0	0	0	0	0	0	0	15.021928
	5.8	0	0	0.0018291	0.0067597	0.0125565	0.0189381	0.0703869	0.2873204	1.0049599	3.0149323	7.2916526	3.1493642		0	0	0	0	0	0	0	0	0	0	0	0	14.8587
	5.9	0	0	0.0017216	0.0064524	0.0120914	0.0183463	0.0547454	0.2413491	0.8504497	2.4351376	6.2204562	5.296658		0	0	0	0	0	0	0	0	0	0	0	0	15.137408
	6	0	0	0.001614	0.0061451	0.0116264	0.0177545	0.0443177	0.1953779	0.7173993	1.956807	5.0427666	7.2162085		0	0	0	0	0	0	0	0	0	0	0	0	15.210017

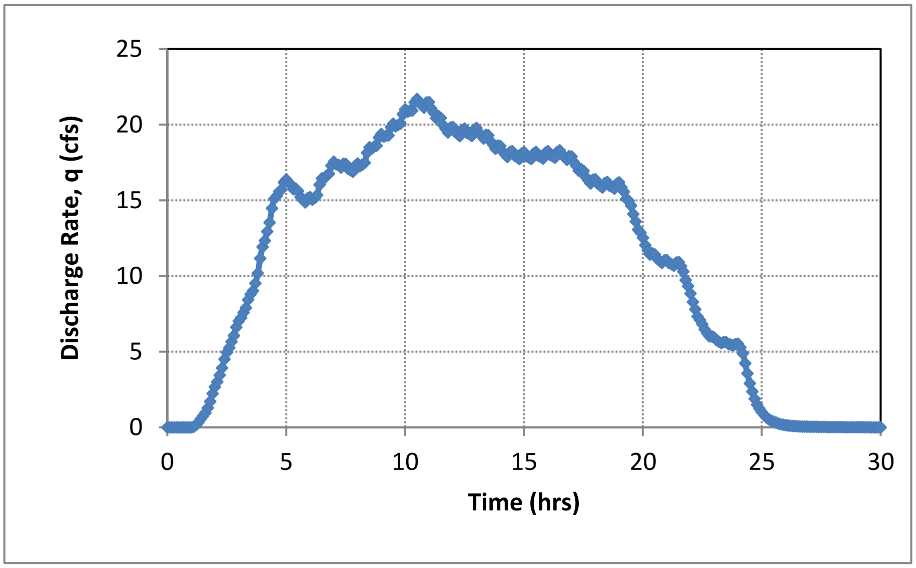
Rows	Omitted	For	Printing	Purposes																						
24.1	0	0	0	0	0	0	0	0	0	0	0	0		0.0044174	0.0099596	0.012416	0.0140612	0.0177828	0.0215125	0.0380606	0.065224	0.1808192	0.4976297	1.5285572	2.8980502	5.2884904
24.2	0	0	0	0	0	0	0	0	0	0	0	0		0.0033131	0.008853	0.0115291	0.0133211	0.0170419	0.0207707	0.0287775	0.0551895	0.1396485	0.3855467	1.2237764	2.9795215	4.887289
24.3	0	0	0	0	0	0	0	0	0	0	0	0		0.0022087	0.0077464	0.0106423	0.012581	0.0163009	0.0200289	0.0237646	0.0451551	0.104587	0.3111348	0.9678535	2.7095024	4.2315056
24.4	0	0	0	0	0	0	0	0	0	0	0	0		0.0011044	0.0066397	0.0097554	0.011841	0.01556	0.0192871	0.023022	0.0351206	0.087853	0.2632986	0.7817279	2.3114569	3.5666666
24.5	0	0	0	0	0	0	0	0	0	0	0	0		0	0.0055331	0.0088686	0.0111009	0.014819	0.0185453	0.0222794	0.028431	0.0711191	0.2221063	0.6281742	1.8738397	2.9048165
24.6	0	0	0	0	0	0	0	0	0	0	0	0		0	0.0044265	0.0079817	0.0103609	0.0140781	0.0178035	0.0215367	0.0228563	0.0543852	0.180914	0.4978862	1.5293325	2.3615615
24.7	0	0	0	0	0	0	0	0	0	0	0	0		0	0.0033199	0.0070949	0.0096208	0.0133371	0.0170617	0.0207941	0.0172816	0.0460183	0.1397217	0.3857455	1.2243971	1.8843924
24.8	0	0	0	0	0	0	0	0	0	0	0	0		0	0.0022132	0.006208	0.0088807	0.0125962	0.0163199	0.0200514	0.0142712	0.0376513	0.1046418	0.3112952	0.9683445	1.5024734
24.9	0	0	0	0	0	0	0	0	0	0	0	0		0	0.0011066	0.0053211	0.0081407	0.0118552	0.015578	0.0193088	0.0138253	0.0292843	0.0878991	0.2634343	0.7821244	1.2378778
25	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0.0044343	0.0074006	0.0111143	0.0148362	0.0185661	0.0133793	0.0237064	0.0711564	0.2222208	0.6284928	1.0153071
25.1	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0.0035474	0.0066605	0.0103733	0.0140944	0.0178235	0.0129333	0.0190581	0.0544137	0.1810072	0.4981387	0.8180502
25.2	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0.0026606	0.0059205	0.0096324	0.0133526	0.0170808	0.0124873	0.0144098	0.0460424	0.1397937	0.3859411	0.6473211
25.3	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0.0017737	0.0051804	0.0088914	0.0126108	0.0163382	0.0120414	0.0118997	0.037671	0.1046957	0.3114531	0.5225554
25.4	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0.0008869	0.0044404	0.0081505	0.011869	0.0155955	0.0115954	0.0115278	0.0292997	0.0879444	0.2635679	0.4448774
25.5	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0.0037003	0.0074095	0.0111272	0.0148529	0.0111494	0.0111559	0.0237188	0.0711931	0.2223335	0.3766406
25.6	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0.0029602	0.0066686	0.0103854	0.0141103	0.0107034	0.0107841	0.0190681	0.0544418	0.181099	0.3102208
25.7	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0.0022202	0.0059276	0.0096436	0.0133676	0.0102575	0.0104122	0.0144173	0.0460661	0.1398646	0.2521766
25.8	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0.0014801	0.0051867	0.0089017	0.012625	0.0098115	0.0100403	0.0119059	0.0376905	0.1047488	0.2023905
25.9	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0.0007401	0.0044457	0.0081599	0.0118823	0.0093655	0.0096685	0.0115338	0.0293148	0.087989	0.1730996
26	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0.0037048	0.0074181	0.0111397	0.0089195	0.0092966	0.0111618	0.023731	0.0712292	0.1466007
26.1	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0.0029638	0.0066763	0.010397	0.0084735	0.0089248	0.0107897	0.0190779	0.0544694	0.1217724
26.2	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0.0022229	0.0059345	0.0096544	0.0080276	0.0085529	0.0104177	0.0144247	0.0460895	0.1053241
26.3	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0.0014819	0.0051927	0.0089117	0.0075816	0.008181	0.0100456	0.011912	0.0377096	0.0910162
26.4	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0.000741	0.0044509	0.0081691	0.0071356	0.0078092	0.0096735	0.0115398	0.0293297	0.0788487
26.5	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0.0037091	0.0074265	0.0066896	0.0074373	0.0093015	0.0111675	0.0237431	0.0694745
26.6	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0.0029672	0.0066838	0.0062437	0.0070654	0.0089294	0.0107953	0.0190876	0.0617724
26.7	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0.0022254	0.0059412	0.0057977	0.0066936	0.0085574	0.010423	0.0144321	0.0540703
26.8	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0.0014836	0.0051985	0.0053517	0.0063217	0.0081853	0.0100508	0.0119181	0.0485097
26.9	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0.0007418	0.0044559	0.0049057	0.0059498	0.0078133	0.0096785	0.0115456	0.0450907
27	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0.0037132	0.0044598	0.005578	0.0074412	0.0093063	0.0111732	0.0416716
27.1	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0.0029706	0.0040138	0.0052061	0.0070691	0.008934	0.0108008	0.0389944
27.2	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0.0022279	0.0035678	0.0048342	0.0066971	0.0085618	0.0104283	0.0363172
27.3	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0.0014853	0.0031218	0.0044624	0.006325	0.0081895	0.0100559	0.0336399
27.4	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0.0007426	0.0026759	0.0040905	0.005953	0.0078173	0.0096834	0.0309627
27.5	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0.0022299	0.0037186	0.0055809	0.007445	0.009311	0.0282855
27.6	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0.0017839	0.0033468	0.0052088	0.0070728	0.0089386	0.0263509
27.7	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0.0013379	0.0029749	0.0048368	0.0067005	0.0085661	0.0244163
27.8	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0.000892	0.0026031	0.0044647	0.0063283	0.0081937	0.0224817
27.9	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0.000446	0.0022312	0.0040927	0.005956	0.0078212	0.0205471
28	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0.0018593	0.0037206	0.0055838	0.0074488	0.0186125
28.1	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0.0014875	0.0033485	0.0052115	0.0070764	0.0171239
28.2	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0.0011156	0.0029765	0.0048393	0.0067039	0.0156353
28.3	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0.0007437	0.0026044	0.004467	0.0063315	0.0141466
28.4	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0.0003719	0.0022324	0.0040948	0.005959	0.012658
28.5	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0.0018603	0.0037225	0.0055866	0.0111694
28.6	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0.0014882	0.0033503	0.0052142	0.0100527
28.7	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0.0011162	0.002978	0.0048417	0.0089359
28.8	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0.0007441	0.0026058	0.0044693	0.0078192
28.9	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0.0003721	0.0022335	0.0040968	0.0067024
29	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0.0018613	0.0037244	0.0055857
29.1	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0.001489	0.003352	0.004841
29.2	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0.0011168	0.0029795	0.0040963
29.3	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0.0007445	0.0026071	0.0033516
29.4	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0.0003723	0.0022346	0.0026069
29.5	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0.0018622	0.0018622
29.6	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0.0014898	0.0014898
29.7	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0.0011173	0.0011173
29.8	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0.0007449	0.0007449
29.9	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0.0003724	0.0003724
30	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0

Incremental Hydrograph #	1	2	3	4	5	6	7	8	9	10	11	12	Columns	37	38	39	40	41	42	43	44	45	46	47	48	
0	1	2	3	4	5	6	7	8	9	10	11	12	Omitted	37	38	39	40	41	42	43	44	45	46	47	48	
0	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	For	18.5	19	19.5	20	20.5	21	21.5	22	22.5	23	23.5	24	
Time to Peak, tp (hr)	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	Printing	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	
Cum Time to Peak, tp (hr)	0.65	1.15	1.65	2.15	2.65	3.15	3.65	4.15	4.65	5.15	5.65	6.15	Purposes	18.65	19.15	19.65	20.15	20.65	21.15	21.65	22.15	22.65	23.15	23.65	24.15	
Excess, R (in)	0	0	0.0027727	0.0079178	0.0119841	0.0152507	0.0179143	0.0263255	0.0309681	0.0298818	0.0258283	0.0268287		0.0284585	0.0285169	0.0228536	0.0190708	0.0190938	0.0191159	0.0191374	0.0114925	0.0095827	0.0095877	0.0095926	0.0095975	
Qa (ac-ft)	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2165223	0.2166339	0.2167438	
Total Time (hr)	Q (ac-ft)	Q (ac-ft)	Q (ac-ft)	Q (ac-ft)	Q (ac-ft)	Q (ac-ft)	Q (ac-ft)	Q (ac-ft)	Q (ac-ft)	Q (ac-ft)	Q (ac-ft)	Q (ac-ft)		Q (ac-ft)	Q (ac-ft)	Q (ac-ft)	Q (ac-ft)	Q (ac-ft)	Q (ac-ft)	Q (ac-ft)	Q (ac-ft)	Q (ac-ft)	Q (ac-ft)	Q (ac-ft)	Q (ac-ft)	Cumulative Q (ac-ft)
0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0
0.1	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0
0.2	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0
0.3	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0
0.4	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0
0.5	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0
0.6	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0
0.7	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0
0.8	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0
0.9	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0
1.1	0	0	0.0002505	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0.0002505
1.2	0	0	0.0009393	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0.0009393
1.3	0	0	0.002129	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0.002129
1.4	0	0	0.003757	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0.003757
1.5	0	0	0.005886	1.588E-18	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0.005886
1.6	0	0	0.0084533	0.0007152	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0.0091685
1.7	0	0	0.0115215	0.0026822	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0.0142036
1.8	0	0	0.015028	0.0060795	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0.0211076
1.9	0	0	0.0192546	0.0107286	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0.0299832
2	0	0	0.0234813	0.0168081	4.808E-18	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0.0402894
2.1	0	0	0.0280523	0.0241394	0.0010826	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0.0532742
2.2	0	0	0.0323102	0.032901	0.0040596	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0.0692709
2.3	0	0	0.0362551	0.0429144	0.0092018	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0.0883713
2.4	0	0	0.0400121	0.0549841	0.0162385	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0.1112347
2.5	0	0	0.043456	0.0670538	0.0254403	1.224E-17	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0.1359501
2.6	0	0	0.0465868	0.0801069	0.0365366	0.0013776	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0.164608
2.7	0	0	0.0493107	0.092266	0.0497981	0.0051662	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0.1965409
2.8	0	0	0.0520345	0.103531	0.064954	0.01171	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0.2322295
2.9	0	0	0.0541948	0.1142596	0.0832223	0.0206647	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0.2723414
3	0	0	0.056355	0.1240942	0.1014906	0.0323746	2.156E-17	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0.3143145
3.1	0	0	0.0580457	0.1330347	0.1212475	0.0464955	0.0016183	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0.3604416
3.2	0	0	0.0597364	0.1408129	0.1396511	0.0633717	0.0060685	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0.4096405
3.3	0	0	0.0606756	0.1485911	0.1567015	0.0826587	0.0137552	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0.4623821
3.4	0	0	0.0616149	0.1547601	0.17294	0.1059064	0.0242738	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0.5194952
3.5	0	0	0.0620845	0.160929	0.1878253	0.1291542	0.038029	4.224E-17	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0.578022
3.6	0	0	0.0625541	0.1657569	0.2013574	0.1542962	0.0546161	0.0023781	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0.6409588
3.7	0	0	0.0626167	0.1705848	0.2131303	0.1777162	0.0744398	0.0089177	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0.7074054
3.8	0	0	0.0626167	0.1732669	0.2249032	0.1994141	0.0970953	0.0202136	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0.7775098
3.9	0	0	0.0626167	0.1759491	0.2342404	0.2200787	0.1244034	0.035671	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0.8529592
4	0	0	0.0626167	0.1772901	0.2435775	0.2390213	0.1517114	0.0558846	4.969E-17	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0.9301017
4.1	0	0	0.0626167	0.1786312	0.2508848	0.2562419	0.1812446	0.0802597	0.0027975	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	1.0126764
4.2	0	0	0.0626167	0.17881	0.2581921	0.2712238	0.208755	0.1093911	0.0104904	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	1.0994791
4.3	0	0	0.0626167	0.17881	0.2622518	0.2862057	0.2342425	0.142684	0.0237783	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	1.190589
4.4	0	0	0.0626167	0.17881	0.2663114	0.2980878	0.2585163	0.1828139	0.0419618	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	1.2891179
4.5	0	0	0.0626167	0.17881	0.2683412	0.30997	0.2807673	0.2229437	0.0657401	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	1.3891891
4.6	0	0	0.0626167	0.17881	0.270371	0.3192691	0.3009955	0.2663434	0.094414	0.0026993	0	0		0	0	0	0	0	0	0	0	0	0	0	0	1.4955192
4.7	0	0	0.0626167	0.17881	0.2706417	0.3285682	0.318594	0.3067706	0.1286828	0.0101224	0	0		0	0	0	0	0	0	0	0	0	0	0	0	1.6048065
4.8	0	0	0.0626167	0.17881	0.2706417	0.3337344	0.3361926	0.3442251	0.1678471	0.0229442	0	0		0	0	0	0	0	0	0	0	0	0	0	0	1.7170118
4.9	0	0	0.0626167	0.17881	0.2706417	0.3389006	0.35015	0.3798961	0.2150541	0.0404898	0	0		0	0	0	0	0	0	0	0	0	0	0	0	1.836559
5	0	0	0.0626167	0.17881	0.2706417	0.3414837	0.3641075	0.4125945	0.2622612	0.063434	0	0		0	0	0	0	0	0	0	0	0	0	0	0	1.9559492
5.1	0	0	0.0626167	0.17881	0.2706417	0.3440667	0.3750307	0.4423203	0.3133147	0.091102	0.0023332	0		0	0	0	0	0	0	0	0	0	0	0	0	2.080236
5.2	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.3859539	0.4681818	0.3608713	0.1241687	0.0087493	0		0	0	0	0	0	0	0	0	0	0	0	0	2.2044047
5.3	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.3920224	0.4940433	0.4049312	0.1619592	0.0198318	0		0	0	0	0	0	0	0	0	0	0	0	0	2.3292674
5.4	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.3980908	0.5145541	0.446893	0.2075102	0.0349973	0		0	0	0	0	0	0	0	0	0	0	0	0	2.458525
5.5	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4011251	0.5350649	0.485358	0.2530612	0.0548291	0		0	0	0	0	0	0	0	0	0	0	0	0	2.5859178
5.6	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4041593	0.5511169	0.5203261	0.3023238	0.0787439	0.0024235		0	0	0	0	0	0	0	0	0	0	0	0	2.715573
5.7	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5671688	0.5507484	0.3482122	0.107325	0.0090882		0	0	0	0	0	0	0	0	0	0	0	0	2.8435861
5.8	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5760866	0.5811707	0.3907265	0.1399891	0.0206		0	0	0	0	0	0	0	0	0	0	0	0	2.9696163
5.9	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5850043	0.6052987	0.4312163	0.1793611	0.0363529		0	0	0	0	0	0	0	0	0	0	0	0	3.0982767
6	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5894632	0.6294268	0.4683319	0.218733	0.0569528		0	0	0	0	0	0	0	0	0	0	0	0	3.2239512

Rows	Omitted	For	Printing	Purposes																						
24.1	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2592789	0.200611	0.1610926	0.097052	0.0292604	26.70647
24.2	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2064541	0.1705113	0.1117831	0.0398809	26.747342
24.3	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2097002	0.17993	0.125431	0.0520185	26.785793
24.4	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2129463	0.1874	0.1384291	0.0666487	26.824137
24.5	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2145694	0.19487	0.1503439	0.0812789	26.859775
24.6	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2161925	0.2007161	0.1611756	0.0971012	26.893899
24.7	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2065622	0.1705992	0.1118398	26.924123
24.8	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2098101	0.1800228	0.1254946	26.950449
24.9	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2130579	0.1874966	0.1384993	26.974176
25	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2146818	0.1949705	0.1504202	26.995194
25.1	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2163057	0.2008196	0.1612574	27.013505
25.2	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2165223	0.2066687	0.1706857	27.028999
25.3	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2165223	0.2099182	0.1801141	27.041677
25.4	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2165223	0.2131677	0.1875917	27.052404
25.5	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2165223	0.2147925	0.1950694	27.061506
25.6	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2165223	0.2164173	0.2009215	27.068983
25.7	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2165223	0.2166339	0.2067736	27.075052
25.8	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2165223	0.2166339	0.2100247	27.078303
25.9	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2165223	0.2166339	0.2132759	27.081554
26	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2165223	0.2166339	0.2149015	27.08318
26.1	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2165223	0.2166339	0.216527	27.084805
26.2	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2165223	0.2166339	0.2167438	27.085022
26.3	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2165223	0.2166339	0.2167438	27.085022
26.4	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2165223	0.2166339	0.2167438	27.085022
26.5	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2165223	0.2166339	0.2167438	27.085022
26.6	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2165223	0.2166339	0.2167438	27.085022
26.7	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2165223	0.2166339	0.2167438	27.085022
26.8	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2165223	0.2166339	0.2167438	27.085022
26.9	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2165223	0.2166339	0.2167438	27.085022
27	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2165223	0.2166339	0.2167438	27.085022
27.1	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2165223	0.2166339	0.2167438	27.085022
27.2	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2165223	0.2166339	0.2167438	27.085022
27.3	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2165223	0.2166339	0.2167438	27.085022
27.4	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2165223	0.2166339	0.2167438	27.085022
27.5	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2165223	0.2166339	0.2167438	27.085022
27.6	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2165223	0.2166339	0.2167438	27.085022
27.7	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2165223	0.2166339	0.2167438	27.085022
27.8	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2165223	0.2166339	0.2167438	27.085022
27.9	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2165223	0.2166339	0.2167438	27.085022
28	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2165223	0.2166339	0.2167438	27.085022
28.1	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2165223	0.2166339	0.2167438	27.085022
28.2	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2165223	0.2166339	0.2167438	27.085022
28.3	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2165223	0.2166339	0.2167438	27.085022
28.4	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2165223	0.2166339	0.2167438	27.085022
28.5	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2165223	0.2166339	0.2167438	27.085022
28.6	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2165223	0.2166339	0.2167438	27.085022
28.7	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2165223	0.2166339	0.2167438	27.085022
28.8	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2165223	0.2166339	0.2167438	27.085022
28.9	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2165223	0.2166339	0.2167438	27.085022
29	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2165223	0.2166339	0.2167438	27.085022
29.1	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2165223	0.2166339	0.2167438	27.085022
29.2	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2165223	0.2166339	0.2167438	27.085022
29.3	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2165223	0.2166339	0.2167438	27.085022
29.4	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2165223	0.2166339	0.2167438	27.085022
29.5	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2165223	0.2166339	0.2167438	27.085022
29.6	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2165223	0.2166339	0.2167438	27.085022
29.7	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2165223	0.2166339	0.2167438	27.085022
29.8	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2165223	0.2166339	0.2167438	27.085022
29.9	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2165223	0.2166339	0.2167438	27.085022
30	0	0	0.0626167	0.17881	0.2706417	0.3444111	0.4045639	0.5945166	0.6993631	0.6748299	0.583288	0.6058814		0.6426872	0.6440069	0.5161114	0.4306829	0.4312006	0.4317016	0.4321867	0.2595384	0.2164089	0.2165223	0.2166339	0.2167438	27.085022

COMPOSITE RUNOFF HYDROGRAPH

(Oscillations due to discretization of 48 unit hydrographs)



COMPOSITE DISCHARGE CURVE