

SECTION 35

HYDROLOGIC RECLAMATION PLAN

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REV.		DATE
NUMBER	REVISION DESCRIPTION	APPROVED

SECTION 35 HYDROLOGIC RECLAMATION PLAN

The objective of the hydrologic reclamation plan and associated mitigation measures is to minimize disturbance to the hydrologic balance within and adjacent to the No Name Permit (NNP) area and to prevent material damage to the hydrologic balance outside the permit area. This hydrologic reclamation plan has been developed in a sequential approach starting with the baseline hydrologic information, the mine plan, and the initial assessment of the probable hydrologic consequences (PHC) (Section 41). The hydrologic reclamation plan includes the measures taken during and after proposed mining to ensure attainment of the hydrologic performance standards. The PHC assessment describes the process for estimating hydrologic impacts and documents any remaining unmitigated impacts.

35.1 Drainage and Sediment Control Structures Removal and Reclamation

The drainage and sediment control structures, identified in Section 25 (Sediment Control Plan) and Section 26 (Drainage Control Plan), will be removed and reclaimed once the structures are no longer needed to manage surface water runoff and sedimentation within a watershed. The area of these structures will be regraded according to the FSC to provide for positive drainage, then topdressed and according to the topsoil redistribution plan and revegetation plan presented in Section 36 (Post-Reclamation Soil) and Section 37 (Post-Reclamation Vegetation), respectively. Once the regraded areas have been reclaimed and erosion rates are less than or equal to the pre-mine rates, the areas will be reconnected to the fluvial geomorphic-appropriate drainages that surround the mine permit area in accordance with 40 CFR part 434 Subpart H. The anticipated reclamation date for the drainage and sediment control structures is provided in Table 26.2-1.

Navajo Transitional Energy Company (NTEC) may take advantage of temporary drainage and sediment control structures to opportunistically establish small area depressions during the FSC regrading. The creation of these small area depressions will enhance post-mining topographic diversity, act as seasonal surface water collection sites, and create microhabitats for post-reclamation wildlife and vegetation communities. Small area depressions have specific design criteria, presented in Section 34 (Post-Reclamation Topography), and unlike permanent impoundments do not require design approval from the Office of Surface Mining Reclamation and Enforcement (OSM) prior to construction. However, OSM must authorize the retention of small depressions prior to bond release.

35.1.1 Sedimentation Ponds and Siltation Structures Removal and Reclamation

Sedimentation ponds and siltation structures are intended to manage and retain runoff and sediment from disturbed areas. NTEC will remove the sediment control ponds and siltation structures by regrading all dams, berms, ditches, and embankments into the FSC to provide for positive drainage. In cases where the sediment contained in the pond or siltation structure cannot be graded into the FSC, the material will be transported and placed in the mine pit or other designated area. Non-earthen materials, such as geotextiles and pond

liners, will be removed and disposed of with non-coal solid waste materials in accordance with the procedures presented in Section 20 (Mining Operations) and applicable regulations.

35.1.2 Temporary Impoundments Removal and Reclamation

Temporary impoundments are structures intended to minimize surface water inflows from undisturbed areas (e.g., highwall impoundments). NTEC will remove all temporary impoundments by regrading the associated dams, berms, ditches, and embankments into the FSC to provide for positive drainage. In cases where the sediment contained in the temporary impoundment cannot be graded into the FSC, the material will be transported and placed in the mine pit or other designated area. Non-earthen materials, such as geotextiles and pond liners, will be removed and disposed of with non-coal solid waste materials in the procedures presented in Section 20 (Mining Operations) and applicable regulations.

35.1.3 Temporary Diversions Removal and Reclamation

The drainage control plan for NNP, presented in Section 26, contains two categories of temporary diversions; intermittent stream diversions and miscellaneous flow diversions. The Pinabete Diversion and East Diversions have been designed to convey the flows from the upstream watersheds of Pinabete Arroyo around the Area 4 South mining area. Pinabete Arroyo is an ephemeral stream by nature; however, based on its watershed size (greater than 1sq mi) it is classified by OSM as an intermittent stream. Miscellaneous flow diversions are diversion structures that have a watershed less than 1sq mi. These miscellaneous flow diversions are generally used for site-specific drainage control plans, such as diverting surface flows around structures or facilities. Further discussion on temporary diversions, including their anticipated reclamation dates, is provided in Section 26 (Drainage Control Plan).

Temporary diversions, identified in the drainage control plan (Section 26), will be removed when they are no longer needed to convey surface water around disturbance areas. Material that was stockpiled during construction of a temporary diversion may be used during the removal and reclamation process. All berms, ditches, embankments, and unused stockpiled materials will be graded into the FSC. The area will be topdressed and seeded according to the topsoil redistribution plan and revegetation plan presented in Section 36 (Post-Reclamation Soil) and Section 37 (Post-Reclamation Vegetation), respectively. In cases where the sediment contained in the temporary diversion or its attenuation structures cannot be graded into the FSC, the material will be transported and placed in the mine pit or other designated area. To the extent practicable, all riprap will be removed and recycled for beneficial use in other parts of the operation. Non-earthen materials such as geotextiles, gabion baskets, and liners, will be removed and disposed of with non-coal solid waste materials in accordance with the procedures presented in Section 20 (Mining Operations) and applicable regulations.

35.1.4 Removal and Reclamation of Other Drainage and Sediment Control Structures

During mining and reclamation operations, NTEC will use best technology currently available (BTCA) measures, including but not limited to diversion, berms, rock-lined down drains, riprap, silt fences, straw bales, and fiber rolls, to control surface water drainage and sediment transport. Further information on the sediment control plan is presented in Section 25. These same measures are known as best management practices (BMP) under Clean Water Act permitting. The two terms, BTCA measures and BMP, may be used interchangeably within this permit application package (PAP). These measures will be removed and reclaimed when they are no longer needed to control drainage and sediment from disturbed areas. These structures, along with a description of their construction, operation, use, maintenance, and approximate removal and reclamation dates, are identified in the sediment control and drainage control plans contained in Sections 25 and 26. When BTCA measures are replaced or are no longer needed they will be removed and disposed of with non-coal solid waste in accordance with the procedures presented in Section 20 Mining Operations and applicable regulations. Inert material, such as rock riprap, may be recycled for other BTCA measures or placed within the mine backfill material. Sediments and earthen materials associated with the BTCA measures will be handled as previously described in this section. Non-earthen materials, such as geotextiles and straw bales, will be removed and disposed of with non-coal solid waste materials in accordance with the procedures presented in Section 20 Mining Operations and applicable regulations. The disturbed areas associated with the BTCA measures will be topdressed and seeded.

35.2 Post-reclamation Drainage

NTEC utilizes fluvial geomorphic reclamation approaches as detailed in Section 34 (Post-Reclamation Topography) and Section 38 (Post-Reclamation Surface Stabilization and Sediment Control) to design the FSC. The fluvial geomorphic reclamation approach utilizes site-specific fluvial geomorphic data, including but not limited to drainage density, tributary lengths and associated areas, sinuosity, width to depth ratios, and length between channels, to develop a FSC that conveys waters and sediment in manner and volume comparable with pre-mine conditions. The combination of these approaches enables NTEC to meet the objectives of the FSC as described below:

1. Achieve mass balance while maximizing contemporaneous regrade acreage between ramps,
2. Achieve positive drainage from all areas including pits and ramps,
3. Develop an adequate drainage density,
4. Allow development of stable drainage channels,
5. Support the approved post-mining land use.

To the extent practicable, the post-reclamation watersheds have been designed to be comparable in size and have confluence locations similar to the pre-mining watersheds. The portion of the Pinabete Arroyo watershed intercepted by mining will be restored and the arroyo reconstructed after mining activities are complete. Adjacent ephemeral drainages to Pinabete Arroyo or other drainages will be reconstructed, using

fluvial geomorphic principles, from the confluence with the undisturbed channel and designed channel. The drainage pattern and alignment of the reconstructed Pinabete Arroyo will differ slightly as a result of mining activities.

NTEC is not requesting a variance for mountain-top removal operations, or steep slope mining as these are not applicable to NNP.

35.2.1 Post-reclamation Watersheds

The post-reclamation watersheds were delineated in a similar manner as the pre-mine watersheds presented in Section 18 (Water Resources). Post-reclamation watersheds and subwatersheds were delineated for each of the major arroyos including Pinabete Arroyo, No Name Arroyo, Brimhall Wash and tributaries to the Chaco River, within and adjacent to the permit area based on the FSC digital elevation models (DEMs). These delineations were used in SEDCAD™ 4 (SEDCAD) modeling to determine flood flows and sediment yields for the post-reclamation watershed and subwatershed conditions (Appendix 41.D). The SEDCAD modeling also allows for comparison of pre-mining and post-reclamation watershed conditions. The results of this comparison, discussed in Section 41 (Probable Hydrologic Consequences), indicate little change in surface flows and sediment yield following reclamation relative to the pre-mine watershed conditions. Exhibit 34.3-1 and Exhibit 34.3-2 presents the post-reclamation SEDCAD watershed delineations and FSC contours for the permit area.

35.2.2 Post-reclamation Drainage Structures

NTEC does not plan to leave any temporary sedimentation ponds and/or impoundments as post-reclamation drainage structures. Permanent impoundments, which function as post-reclamation drainage structures, are discussed in Section 35.2.4.

Temporary post-reclamation BMPs (e.g., silt fences, straw bales, or fiber rolls) may be used as needed to comply with applicable National Pollutant Discharge Elimination System (NPDES) regulations. These BMPs will be removed once they are no longer needed and prior to full bond release.

The pre-mine NNP permit area is bisected by two ephemeral drainages, Pinabete Arroyo and No Name Arroyo. These drainages only flow in response to precipitation events or occasionally from snow-melt runoff. However, these drainages are classified as intermittent stream channels based on the definition provided in 30 CFR 701.5. Utilizing fluvial geomorphic principles and implementing the surface stabilization and sediment control plan presented in Section 38 (Post-Reclamation Surface Stabilization and Sediment Control), NTEC will reconstruct portions of these drainages and their tributaries impacted by mining and reclamation activities. These measures, both of which rely on scientifically proven engineering practices, emphasize landform construction and erosion controls to achieve sediment-control goals. The reconstructed

drainages within the permit area and the associated post-reclamation SEDCAD watersheds are presented on Exhibit 34.3-2.

A permanent drainage control structure designed to mitigate a headcut feature will be installed within the No Name Arroyo channel. This structure is described in Section 35.7.1.

35.2.2.1 Reconstructed Intermittent Stream Channels

The reconstructed reach of Pinabete Arroyo (Exhibit 34.3-2.02) will collect and convey the same watershed area as the pre-mine reach, although the upstream watersheds will confluence with the arroyo channel in different locations than the pre-mine arroyo. The second west tributary will collect and convey surface waters from the majority of the west side of the permit area. The first east tributary will tie in with six sizeable watersheds upstream and to the east of the permit area.

35.2.2.1.1 Pinabete Arroyo Stream Channel Reconstruction Design Plan

Pinabete Arroyo channel reconstruction design assumptions and details are discussed in Appendix 35.C and summarized below. Pinabete Arroyo was classified as a Rosgen Type C5c channel during the baseline evaluation (Appendix 35.C). This designates that the channel has a slope less than 1 percent, a sinuosity greater than 1.2, and a width to depth ratio greater than 12. The reconstructed (i.e., reclaimed) channel was designed as a Rosgen Type C5c channel to match both the upstream and downstream channel characteristics, acknowledging that the reconstructed channel needs to be able to migrate somewhat within the valley area to maintain dynamic equilibrium with undisturbed reaches. The channel design consists of a defined bed and bank to contain the 2yr-1hr storm event and a flood-prone area to contain the 50yr-6hr storm event in accordance with the fluvial geomorphic approach described in Section 38 (Post-Reclamation Surface Stabilization and Sediment Control). Storm events larger than the 50yr-6hr event will leave the defined bed and bank zone and spread across the floodplain valley area. This configuration is compatible with the baseline channel behavior as evidenced by the large, shallow floodplain and high-water debris lines that were noted during baseline data collection (Appendix 35.C). The peak discharges through Pinabete Arroyo were determined using the Soil Conservation Service (SCS) unit hydrograph methodology in conjunction with the United States Army Corps of Engineers (USACE) HEC-HMS model (version 3.0.0), because this method provided values most comparable to baseline conditions (Appendix 35.C). This resulted in an estimated 1,350 cubic feet per second (cfs) discharge rate for the 2yr-1hr event and 4,500 cfs discharge rate for the 50yr-6hr event. The channel is designed to pass these flows at a maximum discharge velocity of 4.5 feet per second (fps).

The reconstructed channel will follow a path similar to the original path but will be slightly offset to the west due to mining advancing from west to east. The slope and elevation of the reconstructed Pinabete Arroyo channel will tie in both upstream and downstream with the undisturbed Pinabete Arroyo channel. As

described in Section 38 Post-Reclamation Surface Stabilization and Sediment Control, there may be reaches along the reconstructed channel and adjacent to tie-in locations where transient aggradation, degradation, and bank erosion may occur to a degree that is commensurate with natural fluvial geomorphic processes and dynamic equilibrium adjustments. The alignment, profile and cross sections of the reconstructed Pinabete Arroyo channel are provided in Section 34.3-2.

NTEC will reestablish a bed of coarse-textured alluvial type material within the defined bed and bank area of the reconstructed channel to support the hydrologic recovery and groundwater recharge capacity of the watershed, as discussed in Section 41 (Probable Hydrologic Consequences). Although the floodplain will be revegetated, the flood-prone and bank-full areas will not be directly revegetated to ensure that vegetation encroachment does not impact the long-term stability and performance of the reconstructed channel. Further discussion on the post-reclamation vegetation and the revegetation plan is provided in Section 37 (Post-Reclamation Vegetation). During the mining and reclamation processes, sediment control and drainage control structures will be used in line with or adjacent to the reconstructed channel to maintain compliance with all applicable federal, state, and tribal water quality regulations. These structures are discussed in Section 25 (Sediment Control Plan) and Section 26 (Drainage Control Plan). The sediment and drainage control structures will be removed in accordance with Section 35.1 when appropriate.

NTEC may reestablish a bed of coarse-textured alluvial type material within the defined bed and bank area of the lower reach of East 1 near the confluence with the reconstructed Pinabete Arroyo channel to support the hydrologic recovery and groundwater recharge capacity of the watershed, as discussed in Section 41 Probable Hydrologic Consequences. The floodplain will be revegetated, but the flood-prone and bank-full areas will not be directly revegetated to ensure that vegetation encroachment does not impact the long-term stability and performance of the reconstructed channel. Further discussion on the post-reclamation vegetation and the revegetation plan is provided in Section 37. To the extent practicable, the bottoms of swales will be revegetated. During the mining and reclamation processes, sediment control and drainage control structures will be used in line with or adjacent to the reconstructed channel to maintain compliance with all applicable federal, state, and tribal water quality. These structures are discussed in Section 25 Sediment Control Plan and Section 26 Drainage Control Plan. The sediment and drainage control structures will be removed when appropriate as discussed earlier in this section.

35.2.2.1.4 No Name Arroyo Reconstructed Channel Design Plans

Mining and reclamation activities require the construction of the temporary Pinabete Diversion, presented in Section 26 (Drainage Control Plan), to convey surface flow around the disturbance area and into No Name Arroyo. The Pinabete Diversion will be removed and reclaimed once the mining and reclamation activities are complete in Area 4 South. The segment of the No Name Arroyo channel that was disturbed during construction and operation of the Pinabete Diversion will be reclaimed at this time.

The alignment of the reconstructed No Name Arroyo channel coincides with the undisturbed channel. The channel section is proportioned to have both a pilot and main channel. The reconstructed channel alignment are presented in Exhibit 34.1-1. The flows equal to and less than the 2yr-6hr precipitation event will be contained in the pilot channel and flows from larger precipitations will overflow into the main channel.

Using HEC-RAS computer software, the channel flow velocities of the undisturbed and reconstructed No Name Arroyo channel were compared to determine if the stability of the reconstructed channel is equal to or better than the undisturbed channel. In this comparison, the channel with the lower velocity will be more stable. The baseline and post-reclamation peak flows from the 2yr, 10yr, 25yr, and 100yr-6hr-precipitation events were used in the analysis. For each precipitation event, the maximum and average velocities in the reconstructed channel are less than the undisturbed channel (Table 35.2-1), indicating the reconstructed channel is more stable. The lower-flow velocities in the reconstructed channel are also due to the reduced peak flows of the post-reclamation modeling. Detailed results of the HEC-RAS analysis for the undisturbed and reconstructed channels are presented in Appendix 35.A and Appendix 35.B, respectively.

35.2.2.2 Reconstructed Miscellaneous Flow Stream Channels

There are seven minor tributaries and subwatersheds to Pinabete Arroyo and two other minor tributaries and subwatersheds to unnamed tributaries of Pinabete Arroyo and No Name Arroyo that will be reconstructed in the permit area (Exhibit 34.1-1). All these tributaries function as ephemeral streams and have watershed sizes less than 1 sq mi, classifying them as miscellaneous flow channels.

These minor tributaries will have steeper channel profiles and the subwatersheds will have smaller drainage areas than the channels described under Section 35.2.2.1. The channel profile will be concave and tie in with the reconstructed Pinabete Arroyo and tributaries to Pinabete and No Name arroyos at slopes that support long-term stability. The head elevation and head slope will vary based on the topography established after backfilling and grading of the adjacent areas. The design and construction of the miscellaneous flow channels will follow the fluvial geomorphic principles outlined in Section 38 Post-Reclamation Surface Stabilization and Sediment Control. The channel type will reflect a Rosgen Type A or Type C classification depending on slope. The channels will contain up to the 50yr-6hr event within a defined bed and bank or valley channel, as appropriate. NTEC may reestablish a bed of coarse-textured alluvial type material within the defined bed and bank area of the lower reaches near the confluence with the reconstructed Pinabete Arroyo channel to support the hydrologic recovery and groundwater recharge capacity of the watershed, as discussed in Section 41 Probable Hydrologic Consequences. NTEC will not reestablish a bed of coarse-textured alluvial type material in the upper reaches of these minor tributaries. The minor tributary subwatersheds will be revegetated similar to the reconstructed intermittent stream channels. The floodplain will be revegetated; the flood-prone and bank-full areas will not be directly revegetated to ensure that vegetation encroachment does not impact the long-term stability and performance of the reconstructed channel. Further discussion on the

post-reclamation vegetation and the revegetation plan is provided in Section 37 Post-Reclamation Vegetation. To the extent practicable, the bottoms of swales will be revegetated. During the mining and reclamation processes, sediment control and drainage control structures will be used in line with or adjacent to the reconstructed channel to maintain compliance with all applicable federal, state, and tribal water quality. These structures are discussed in Section 25 Sediment Control Plan and Section 26 Drainage Control Plan. The sediment and drainage control structures will be removed when appropriate as discussed earlier in this section.

35.2.3 Permanent Diversions

NTEC does not plan to leave any permanent diversions in place once reclamation activities and bond release are complete. Therefore, this section does not apply to NNP.

35.2.4 Permanent Impoundments

NTEC does not plan to leave any permanent impoundments after reclamation activities are complete and bond release has been obtained. Therefore, this section does not apply to NNP.

Refer to Section 35.5 for a discussion of the protection and replacement of water rights of present users and to Section 33 (Post-Reclamation Roads, Buildings, Facilities, and Other Structures) for details on the construction of replacement water resources.

35.3 Acid and Toxic Drainage Control

Based on the overburden characterization study presented in Section 17 (Geologic Information), NTEC does not anticipate the need to treat any acid or toxic drainage during mining or reclamation operations in the post-reclamation environment. The study concluded that there were no widespread occurrences of potentially acid-or toxic-forming materials (PATFM) present in the permit area. Therefore, these materials will not require any special handling or disposal procedures. The small quantities of PATFM and other material unsuitable for plant growth will be placed in mined-out areas and handled in a manner that protects the environmental resources and will not impact surface drainages or the FSC. The placement of this material is discussed in Section 20 (Mining Operations) and Section 34 (Post-Reclamation Topography).

NTEC will conduct surface and groundwater monitoring according to the monitoring plans provided in Section 42 (Monitoring, Maintenance, Inspections, and Examinations).

35.4 Restoration of Ground Water Recharge Capacity

Mining and reclamation activities in the permit area will increase the recharge capacity of the disturbed area because the in-situ strata are replaced with unconsolidated backfill (Section 41, Probable Hydrologic Consequences). This unconsolidated backfill has a higher hydraulic conductivity than the undisturbed strata.

No special effort will be required to restore the groundwater recharge capacity from surface infiltration over the general disturbance area. Efforts will be made to establish an alluvial channel bed for the reconstructed Pinabete Arroyo to restore alluvial recharge capacity. The post-reclamation groundwater recharge capacity is discussed in Section 41 (Probable Hydrologic Consequences).

As described in Section 41 (Probable Hydrologic Consequences) and summarized in Table 41.3-2, the modeled post-reclamation recharge rate estimate for the permit area is 0.041 in per yr. This is about twice the pre-mining groundwater recharge rate discussed in Section 18 (Water Resources) and summarized in Table 41.3-2. The pre-mining groundwater recharge rate for Area 4 South is 0.020 in per yr and for Area 5 is 0.019 in per yr. Groundwater modeling predicts it may take as long as 500 years for the mine backfill to reach a final steady-state potentiometric level. The post-reclamation groundwater recharge capacity and rates and steady-state groundwater modeling were determined as part of the probable hydrologic consequences assessment and are discussed in greater detail in Section 41.

35.5 Protection and Replacement of Water Rights of Present Users

NTEC holds water rights Surface Permit Number 2838 issued by the New Mexico Office of the State Engineer. This diversionary surface water usage is for irrigation of reclaimed areas of the mine, dust suppression, potable water after suitable treatment, and other appropriate uses.

During mining development, NTEC will disrupt surface water availability to ephemeral or intermittent impoundments and an alluvial well used for livestock watering (Exhibit 18.1-2). The use of the livestock impoundment features is limited by the availability of sufficient water from precipitation events and the naturally poor quality of the surface water. Pre-mining water resource information is provided in Section 18. NTEC will provide alternative sources for livestock watering (e.g., water tanks) to customary land users holding grazing permits for affected areas within the NTEC lease. NTEC will replace the lost water sources should NTEC find that the water users are still in need of the sources that existed pre-mine. Should the customary land user require alternative water sources after reclamation, NTEC may replace livestock impoundments and the alluvial well affected by mining with replacement post-reclamation livestock impoundments or wells, as deemed appropriate by NTEC. The replacement livestock impoundments or wells will provide comparable water quantity and quality for use in livestock watering to pre-mine impoundments and wells. NTEC does not intend for any impoundments or tanks to be used as a source of domestic water, as local sources of surface and groundwater do not meet drinking water standards. NTEC will coordinate with OSM and with customary land users to determine the locations of potential impoundments or wells as a part of preparations for Phase III bond release. Additional information about these post-reclamation structures is included in Section 33 Post-Reclamation Roads, Buildings, Facilities, and Other Structures. The post-reclamation changes to surface water quantity and quality are presented in Section 41 Probable Hydrologic Consequences.

35.6 Steps to Meet Federal, State, and Tribal Water Quality Laws, Regulations, and Standards

As described in Section 8 (Compliance with Air and Water Quality Laws and Regulations) of this PAP, NTEC will obtain the appropriate coverage under Section 402, which is administered by the U.S. Environmental Protection Agency (EPA) Region 9 for lands within the Navajo Nation; Section 404, which is administered through the USACE; and Section 401 certification administered through the Navajo Nation Environmental Protection Agency (NNEPA) as needed.

NTEC will meet the water quality standards through various practices described throughout this section and following the methods and procedures outlined in Section 25 (Sediment Control Plan) for controlling sediment during surface coal mining and reclamation operations. Constructing stable drainages and surfaces according to the FSC and the post-reclamation surface stabilization and sediment control plan will prevent additional contributions of sediment and suspended solids to drainages within and adjacent to the permit area. Reclaimed drainages and associated watersheds will be reconnected to the natural drainage system (i.e., not affected by mining) in accordance with 40 CFR part 434 Subpart H.

Section 41 (Probable Hydrologic Consequences) describes the analysis and demonstrates how the various mitigation and preventive measures described in this section will ensure NTEC complies with applicable water quality laws, regulations, and standards.

35.7 Steps to Minimize Hydrologic Balance Disturbances and Prevent Material Damage

In accordance with 30 CFR 780.21(h), NTEC is submitting this hydrologic reclamation plan, which has been designed to:

- Minimize to the extent possible disturbances to the hydrologic balance within the permit and adjacent areas;
- Prevent to the extent possible material damage to the hydrologic balance outside the permit area;
- Assure the protection or replacement of water rights; and
- Support the approved post-mining land use.

NTEC will utilize this plan and other sections of the PAP to comply with 30 CFR 816.41 through 816.43 and to prevent to the extent possible adverse impacts to the hydrologic balance within and outside the permit area.

Groundwater Protection and Monitoring

Material unsuitable for plant growth will be placed in mined-out areas and handled in a manner that protects environmental resources and minimizes adverse impacts to the groundwater regime. The measures and procedures to handle this material are discussed in Section 20 (Mining Operations) and Section 34 (Post-Reclamation Topography). The groundwater monitoring plan, presented in Section 42 (Monitoring,

Maintenance, Inspections, and Examinations), has been developed to monitor changes in the quantity and quality of the groundwater resource during mining and subsequent reclamation. Baseline groundwater sampling, presented in Section 18 (Water Resource), indicated the potential use of groundwater, i.e. livestock watering, within and adjacent to the permit area is limited due low permeability and yield and poor water quality. The potential use of groundwater in the reclaimed area will also be negligible due to the low yield and water quality, as discussed in Section 41 (Probable Hydrologic Consequences).

Groundwater model simulations presented in Section 41 (Probable Hydrologic Consequences) show groundwater changes expected from mining and reclamation activities. Removal of the interbedded strata results in a lower water table in the backfilled spoil relative to pre-mining, but higher potentiometric conditions at the base of backfilled pit. The steady-state heads in the mine spoil are much more uniform with depth, in comparison with the large vertical gradients and perched groundwater prior to mining.

Resaturated mine backfill will develop as a result of recharge from precipitation, lateral inflow from the coals and interburden of the Fruitland Formation, and upward flow from the Pictured Cliffs Sandstone (PCS) formation. Although modeled backfill recharge rates were estimated to be twice the pre-mine rate, model results indicate that it may take as long as 500 years for groundwater levels to recover in the backfill to a steady-state condition. Recovery rates may actually be slower if the post-reclamation recharge rates are closer to the pre-mine rates. Groundwater flow will be predominantly toward the backfilled mine pit as water levels recover in the backfill (Section 41, Probably Hydrologic Consequences). Once water levels rise sufficiently in the mine backfill, groundwater will flow at a very slow rate from the backfill into the lower coal seams of the Fruitland Formation, into the PCS, and toward the topographic lows along the alluvial channels of No Name and Pinabete arroyos (Section 41, Probably Hydrologic Consequences).

Transport simulation results show several flow paths from backfilled pits with most flow vertical to PCS, some flow through alluvium of Pinabete and No Name arroyos, and a minor amount of flow down dip through the unmined coals and shales of the Fruitland Formation. Background total dissolved solids (TDS) concentrations in PCS are higher than the TDS levels expected for spoil water. Thus, the primary direction for spoil water migration is into a water-bearing zone that has higher TDS concentrations. Similarly, the TDS concentrations in the lateral flow to the alluvium of Pinabete and No Name arroyos are lower than the baseline TDS concentrations in these hydrogeologic units. However, the TDS concentrations in the alluvium of Pinabete and No Name arroyos are not expected to decrease significantly a result of mining because the contribution from spoil water is much smaller than the contribution from alluvial recharge and upgradient alluvial flows. Likewise, the TDS concentrations in the alluvium of Pinabete and No Name arroyos would not be expected to increase significantly in the event that the TDS concentrations in spoil water are higher than predicted.

The primary factor controlling the fate and transport of water in mine spoils is the extremely low rate of flow from the mine backfill that will occur as a result of the low recharge rates and low hydraulic conductivity of the mine backfill. Based on these results, mining is estimated to have little effect on the long-term post-reclamation concentrations in the groundwater in the PCS and the alluvium of Pinabete Arroyo and No Name Arroyo down gradient of the mine areas. Groundwater flow from the mine backfill will be insufficient to sustain intermittent or perennial baseflow in streams or flow at seeps and springs.

Surface Water Protection and Monitoring

The surface water monitoring plan, presented in Section 42 (Monitoring, Maintenance, Inspections, and Examinations), has been developed to monitor changes in the quantity and quality of the surface water resources during mining and reclamation activities. The fluvial geomorphic and traditional reclamation approaches utilized in the permit area will replicate the pre-mine landscape and reduce surface erosion and sediment yield to less than or equal to pre-mine conditions. The fluvial geomorphic and traditional reclamation approaches are discussed in Section 34 (Post-Mining Topography) and Section 38 (Post-Reclamation Surface Stabilization and Sediment Control). Post-reclamation sedimentology is discussed in Section 41 (Probable Hydrologic Consequences). NTEC will use a combination of the BTCA measures and BMPs, presented in Section 25 (Sediment Control and Section) and Section 38 (Post-Reclamation Surface Stabilization and Sediment Control), to control sediment and maintain water quality.

Surface materials unsuitable for plant growth will be placed in mined-out areas and handled in a manner that protects environmental resources and minimizes adverse surface water impacts. The measures and procedures to handle this material are discussed in Section 20 (Mining Operations) and Section 34 (Post-Reclamation Topography).

Acid and Toxic-Forming Materials

The handling of PATFM in a manner to prevent adverse impacts to surface water and groundwater is presented in Section 20 (Mining Operations) and Section 34 (Post-Reclamation Topography).

Transfer of Wells

Upon completion of mining, all wells will become the property of the Navajo Nation, as specified in NTEC's lease agreement. Any wells that the Navajo Nation does not want to maintain will be removed and the area reclaimed. Further discussion on the removal and the retention of wells in the post-reclamation landscape is provided in Section 32 (Temporary Structures and Facilities Removal and Reclamation) and Section 33 (Post-Reclamation Roads, Building, Facilities, and Other Structures), respectively.

Water Rights and Replacement

The protection and replacement of water rights of present users is discussed in Section 35.5.

Discharges Into an Underground Mine

No underground mining is anticipated within the permit area, therefore, the potential for discharges to an underground mine does not exist.

Post-mining Land Use

Area disturbed by mining will be reclaimed to a grazing post-mining land use (PMLU) that is consistent with the pre-mining land use, described in Section 30 (Post-Reclamation Land Use) and Section 10 (Land Use), respectively. The reclamation of the area will be accomplished in a manner to minimize disturbance of the hydrologic balance within and adjacent to the permit area and prevent material damage to the hydrologic balance outside of the permit area. This will be accomplished by following methods and procedures described in the operation plan, sediment control plan, reclamation plan and monitoring plans found in Sections 20 through 23, Sections 25 through 26, Sections 30 through 39, and Section 42, respectively, of this PAP.

35.7.1 Mitigation Plan for No Name Arroyo Headcut Area

During surveys of baseline surface water resources, presented in Section 18, a headcut erosion feature was identified along the lower reach of No Name Arroyo at the western edge of the permit boundary. This headcut involves a near vertical drop of about 10 to 12 ft. The headcut is approximately 30 ft wide and the channel is incised about 8 to 12 ft downstream of the headcut. The channel widths in this segment vary from approximately 10 to 30 ft with near vertical channel banks. Channel bends are fairly minor and the channel bed is braided in places with channel vegetation consisting primarily of grasses with some salt cedar and low brush. No Name Arroyo consists of a wide shallow channel heavily braided in places and vegetated with grasses and weeds, brush, and some salt cedar upstream of the headcut.

Headcut migration occurs as a series of discrete mass failures of the surface layer caused by undercutting in a plunge pool formed immediately downstream. The timescale for each failure episode is controlled by the soil strength, soil unit weight, erodibility and critical shear stress, overall headcut height, backwater depth, and approach flow depth (Hanson et al. 2001). The rate of headcut advance was found to increase with both the upstream flow depth and with the backwater depth below the headcut height. Based on these results, it is expected that an increase in flows in the No Name channel as a result of the Pinabete Diversion could increase the rate of headcut migration and sediment yield in surface water flows. Consequently, a mitigation plan for headcut stabilization was developed to prevent further migration and sediment contributions.

The structure is designed to pass the estimated peak flow from a 10yr-6hr event (combined No Name and Pinabete Diversion flows) into the incised channels below the headcut through two gabion drop structures. Berms located on either side of the two gabion drop structures serve to direct floodplain flows to the two

structures. A gravel overflow on one of the berms allows flow from events larger than the 10yr-6hr storm to bypass the drop structures and continue as floodplain overflow. The headcut mitigation structure will benefit the water quality of No Name Arroyo by improving channel stability and reducing sediment contributions from erosion. The design for the headcut mitigation structure is shown on Exhibit 35.7.1 HEC-RAS calculation modeling design and slope stability analyses are provided in Section 26 (Drainage Control Plan), specifically Attachment 26.A-B-1 located in Appendices 26.A

35.8 Alluvial Valley Floor Reclamation Plan

OSM has determined that there is no alluvial valley floors present within or adjacent to the permit area. Therefore, this section is not applicable. The negative alluvial valley floor determination is provided in Section 19 (Alluvial Valley Floors).

35.9 Hydrologic Reclamation Plan Information Collection and Analysis

Fluvial geomorphic principles presented in the surface stabilization plan in Section 38 (Post-Reclamation Surface Stabilization and Sediment Control) and Natural Regrade with Geofluv™ software were used to develop the channel designs presented in the hydrologic reclamation plan. Model inputs for the reconstruction designs are included in Appendix 35.C.

SEDCAD modeling for the channel designs is contained in Appendix 41.C and 41.D with baseline modeling contained in Appendix 18.B. The subwatershed information was developed using Carlson Civil Suite, AutoCAD®, and ArcGIS® software. The base mapping used to develop subwatersheds is a combination of 10-ft-contoured aerial flight and digital elevation model (DEM) data of United States Geologic Survey (USGS) 7.5-minute topographic quadrangle maps (NMRGIS 2009; USGS 2009). All DEM analysis was performed utilizing the Spatial Analyst extension for ArcGIS® on DEM images projected to the North American Datum of 1927- State Plane New Mexico West coordinate system and in standard units (ft) of measure. Soils information for the SEDCAD modeling came from detailed baseline surveys, presented in Section 14 (Soil), of the permit area and Natural Resources Conservation Service surveys (Keetch 1980) of the adjacent areas outside of the permit area. Underlying assumptions that form the basis of all SEDCAD modeling are presented in Section 38 (Post-Reclamation Surface Stabilization and Sediment Control).

35.10 Certification of Designs and Exhibits

Certified exhibits for this section of the PAP are available for review upon request at the Navajo mine office.

References

Hanson, G. J., K. M. Robinson, and K. R. Cook. 2001. Prediction of Headcut Migration Using a Deterministic Approach. Transactions of the ASAE. Vol. 44(3):525–531.

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(Verified 18 March 2009).

Appendix 35.A

No Name Arroyo

HEC-RAS Analysis - Undisturbed Channel

Profile Output Table - No Name Arroyo Undisturbed Channel 2yr-6hr
 HEC-RAS Plan: Premine River: No Name Reach: Reach 1 Profile: PF 1

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Vel Lt (ft/s)	Vel Rt (ft/s)	Vel Total (ft/s)	Max Chnl Depth (ft)
92	101.0	5430.37	5432.98	5431.10	5432.99	0.000093	0.79	128.54	59.60	0.09			0.79	2.61
91.8925*	101.0	5430.22	5432.98	5431.23	5432.99	0.000157	0.99	102.01	49.55	0.12			0.99	2.75
91.785*	101.0	5430.07	5432.96	5431.30	5432.99	0.000274	1.27	79.28	39.60	0.16			1.27	2.89
91.6775*	101.0	5429.92	5432.94	5431.33	5432.98	0.000480	1.67	60.31	29.94	0.21			1.67	3.02
91.57	101.0	5429.77	5432.89	5431.45	5432.97	0.000857	2.27	44.50	20.78	0.27			2.27	3.12
91.465*	101.0	5429.59	5432.84	5431.67	5432.96	0.001426	2.78	36.30	18.22	0.35			2.78	3.25
91.36*	101.0	5429.42	5432.74	5431.84	5432.93	0.002482	3.47	29.11	15.78	0.45			3.47	3.32
91.255*	101.0	5429.25	5432.57	5431.97	5432.88	0.004641	4.45	22.69	13.35	0.60			4.45	3.32
91.15	101.0	5429.07	5432.03	5432.03	5432.76	0.014036	6.87	14.69	9.94	1.00			6.87	2.96
91.0533*	101.0	5428.81	5431.16	5431.60	5432.49	0.032540	9.25	10.92	9.23	1.50			9.25	2.35
90.9566*	101.0	5428.55	5430.74	5431.18	5432.14	0.036548	9.48	10.65	9.66	1.59			9.48	2.19
90.86	101.0	5428.29	5430.40	5430.84	5431.75	0.036444	9.33	10.83	10.16	1.59			9.33	2.11
90.6	101.0	5427.43	5429.44	5429.87	5430.74	0.036625	9.17	11.01	10.73	1.60			9.17	2.00
90.45*	101.0	5426.88	5428.70	5429.17	5430.12	0.044485	9.54	10.59	11.43	1.75			9.54	1.82
90.3	101.0	5426.33	5427.93	5428.36	5429.32	0.056065	9.48	10.65	14.11	1.92			9.48	1.60
90.2*	101.0	5426.29	5427.64	5428.00	5428.73	0.051401	8.40	12.03	18.24	1.82			8.40	1.35
90.1*	101.0	5426.25	5427.41	5427.67	5428.19	0.040645	7.09	14.25	23.59	1.61			7.09	1.16
90	101.0	5426.21	5427.20	5427.33	5427.69	0.034968	5.62	17.97	37.79	1.44			5.62	0.98
89.875*	101.0	5425.98	5427.06	5427.14	5427.46	0.021365	5.08	19.89	33.72	1.17			5.08	1.07
89.75*	101.0	5425.75	5426.94	5426.89	5427.25	0.012717	4.48	22.56	31.30	0.93			4.48	1.19
89.625*	101.0	5425.52	5426.75	5426.71	5427.07	0.012020	4.54	22.24	28.87	0.91			4.54	1.23
89.5	101.0	5425.29	5426.54	5426.54	5426.90	0.013376	4.86	20.79	26.35	0.96			4.86	1.24
89.4166*	101.0	5425.08	5426.24	5426.37	5426.77	0.023857	5.85	17.28	25.70	1.26			5.85	1.16
89.3333*	101.0	5424.87	5426.10	5426.21	5426.59	0.022367	5.62	17.96	27.03	1.22			5.62	1.23
89.25	101.0	5424.66	5426.29	5426.02	5426.46	0.005477	3.38	29.92	33.59	0.63			3.38	1.62
89.125*	101.0	5424.40	5426.28	5425.79	5426.39	0.002848	2.69	37.60	36.46	0.47			2.69	1.88
89	101.0	5424.13	5426.29	5425.51	5426.35	0.001434	2.05	49.16	42.62	0.34			2.05	2.16
88.8266*	101.0	5423.95	5426.23	5425.58	5426.32	0.002348	2.47	40.96	39.05	0.42			2.47	2.27
88.6533*	101.0	5423.77	5426.15	5425.53	5426.27	0.002737	2.72	37.13	34.16	0.46			2.72	2.38
88.48	101.0	5423.59	5426.08	5425.41	5426.21	0.002943	2.86	35.30	31.70	0.48			2.86	2.49
88.2400*	101.0	5423.60	5426.01	5425.40	5426.14	0.002980	2.88	35.04	31.45	0.48			2.88	2.41
88	101.0	5423.60	5425.97	5425.28	5426.07	0.002129	2.63	38.42	30.68	0.41			2.63	2.36
87.875*	101.0	5423.66	5425.91	5425.33	5426.04	0.002835	2.90	34.83	29.87	0.47			2.90	2.25
87.75*	101.0	5423.72	5425.85	5425.38	5426.00	0.003678	3.18	31.75	28.80	0.53			3.18	2.13
87.625*	101.0	5423.78	5425.75	5425.40	5425.95	0.005091	3.53	28.63	28.39	0.62			3.53	1.97
87.5	101.0	5423.84	5425.57	5425.45	5425.86	0.009300	4.31	23.42	27.06	0.82			4.31	1.73
87.3333*	101.0	5423.84	5425.46	5425.30	5425.71	0.008028	4.06	24.85	28.13	0.76			4.06	1.61
87.1666*	101.0	5423.84	5425.38	5425.13	5425.58	0.005697	3.61	27.98	29.21	0.65			3.61	1.54
87	101.0	5423.84	5425.33	5424.90	5425.49	0.003786	3.16	31.92	29.74	0.54			3.16	1.49
86.74	101.0	5423.82	5425.24	5424.79	5425.39	0.003727	3.12	32.38	30.41	0.53			3.12	1.42
86.62*	101.0	5423.73	5425.16	5424.80	5425.33	0.004703	3.34	30.25	30.58	0.59			3.34	1.43
86.5	101.0	5423.64	5424.96	5424.80	5425.25	0.009749	4.35	23.21	27.13	0.83			4.35	1.32
86.3849*	101.0	5423.55	5424.79	5424.79	5425.14	0.013813	4.74	21.32	28.66	0.97			4.74	1.24
86.27	101.0	5423.47	5424.84	5424.46	5424.94	0.003173	2.61	38.67	42.08	0.48			2.61	1.37
86.1349*	101.0	5423.31	5424.75	5424.47	5424.89	0.004499	2.97	34.02	39.81	0.57			2.97	1.44
86	101.0	5423.15	5424.58	5424.46	5424.80	0.009151	3.75	26.95	37.92	0.78			3.75	1.43
85.8*	101.0	5422.90	5424.45	5424.24	5424.63	0.006578	3.35	30.16	39.39	0.67			3.35	1.55
85.6	101.0	5422.64	5424.39	5424.01	5424.51	0.003827	2.84	35.61	39.72	0.53			2.84	1.75
85.35*	101.0	5422.58	5424.30	5423.91	5424.42	0.003370	2.73	37.00	39.74	0.50			2.73	1.72
85.1*	101.0	5422.52	5424.23	5423.81	5424.34	0.002953	2.62	38.52	39.76	0.47			2.62	1.71
84.85	101.0	5422.46	5424.17	5423.71	5424.27	0.002547	2.51	40.26	39.72	0.44			2.51	1.71
84.6833*	101.0	5422.36	5424.08	5423.72	5424.21	0.004349	2.88	35.04	42.06	0.56			2.88	1.72
84.5166*	101.0	5422.27	5423.92	5423.63	5424.12	0.006542	3.59	28.10	32.81	0.68			3.59	1.65
84.35	101.0	5422.17	5423.88	5423.44	5424.01	0.003538	2.93	34.46	34.22	0.51			2.93	1.71
84.2333*	101.0	5422.17	5423.85	5423.45	5423.97	0.003451	2.72	37.12	48.63	0.50			2.72	1.68
84.1166*	101.0	5422.17	5423.84	5423.39	5423.92	0.002818	2.27	44.43	55.16	0.45			2.27	1.67
84	101.0	5422.17	5423.83	5423.28	5423.88	0.001814	1.91	52.87	61.26	0.36			1.91	1.66
83.75	101.0	5422.39	5423.47	5423.47	5423.76	0.016148	4.31	23.44	42.15	1.01			4.31	1.08
83.625*	101.0	5422.08	5422.84	5423.07	5423.41	0.061106	6.08	16.60	47.39	1.81			6.08	0.76
83.5	101.0	5421.77	5423.20	5422.54	5423.21	0.000583	0.98	103.00	138.35	0.20			0.98	1.43
83.3849*	101.0	5421.42	5423.18	5422.39	5423.20	0.000693	1.29	78.11	78.94	0.23			1.29	1.76
83.27	101.0	5421.08	5423.10	5422.36	5423.19	0.001813	2.40	42.11	34.41	0.38			2.40	2.02
83	101.0	5420.96	5423.03	5422.45	5423.13	0.002273	2.51	40.24	36.37	0.42			2.51	2.07
82.8825*	101.0	5420.96	5423.03	5422.31	5423.09	0.001558	1.99	50.84	49.44	0.35			1.99	2.07
82.765*	101.0	5420.96	5423.03	5422.21	5423.07	0.001051	1.70	59.27	54.05	0.29			1.70	2.07
82.6475*	101.0	5420.97	5423.02	5422.15	5423.06	0.000783	1.49	67.61	60.25	0.25			1.49	2.05
82.53	101.0	5420.97	5423.02	5422.10	5423.05	0.000597	1.33	75.76	65.26	0.22			1.33	2.05
82.3999*	101.0	5420.95	5423.01	5422.08	5423.04	0.000573	1.37	73.86	59.38	0.22			1.37	2.06
82.27	101.0	5420.93	5422.98	5422.00	5423.03	0.000824	1.76	57.45	40.77	0.26			1.76	2.05
82.1349*	101.0	5421.01	5422.94	5422.23	5423.01	0.001534	2.18	46.25	38.14	0.35			2.18	1.93
82	101.0	5421.09	5422.84	5422.46	5422.98	0.003815	2.97	34.05	35.35	0.53			2.97	1.75

Profile Output Table - No Name Arroyo Undisturbed Channel 2yr-6hr
 HEC-RAS Plan: Premine River: No Name Reach: Reach 1 Profile: PF 1

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Vel Lt (ft/s)	Vel Rt (ft/s)	Vel Total (ft/s)	Max Chnl Depth (ft)
81.875*	101.0	5421.00	5422.76	5422.43	5422.92	0.004489	3.17	31.82	33.76	0.58			3.17	1.76
81.75*	101.0	5420.92	5422.68	5422.38	5422.86	0.005255	3.41	29.65	31.85	0.62			3.41	1.76
81.625*	101.0	5420.83	5422.57	5422.33	5422.78	0.006525	3.71	27.20	30.21	0.69			3.71	1.74
81.5	101.0	5420.74	5422.36	5422.31	5422.68	0.011250	4.55	22.20	27.37	0.89			4.55	1.62
81.25	101.0	5420.44	5421.95	5421.95	5422.34	0.015384	5.05	19.99	26.61	1.03			5.05	1.51
81.125*	101.0	5420.06	5421.88	5421.51	5422.03	0.004340	3.10	32.59	35.02	0.57			3.10	1.82
81	101.0	5419.68	5421.92	5421.08	5421.98	0.001267	1.94	51.98	44.72	0.32			1.94	2.24
80.875*	101.0	5419.60	5421.87	5421.14	5421.96	0.002000	2.38	42.36	37.66	0.40			2.38	2.27
80.75	101.0	5419.53	5421.73	5421.28	5421.91	0.004335	3.39	29.81	27.78	0.58			3.39	2.20
80.5	101.0	5419.47	5421.59	5421.23	5421.80	0.005092	3.68	27.44	25.44	0.62			3.68	2.12
80.25*	101.0	5419.47	5421.46	5421.14	5421.67	0.005312	3.64	27.77	27.12	0.63			3.64	1.99
80	101.0	5419.47	5421.35	5421.03	5421.53	0.005067	3.44	29.37	30.15	0.61			3.44	1.88
79.775*	101.0	5419.29	5421.30	5420.75	5421.42	0.002831	2.75	36.71	34.02	0.47			2.75	2.01
79.55	101.0	5419.11	5421.29	5420.54	5421.36	0.001495	2.18	46.32	37.60	0.35			2.18	2.18
79.465*	101.0	5419.12	5421.26	5420.59	5421.35	0.001769	2.33	43.42	36.36	0.38			2.33	2.14
79.38*	101.0	5419.13	5421.23	5420.63	5421.33	0.002127	2.51	40.30	34.68	0.41			2.51	2.10
79.295*	101.0	5419.14	5421.20	5420.66	5421.31	0.002637	2.72	37.16	33.28	0.45			2.72	2.06
79.21*	101.0	5419.15	5421.15	5420.69	5421.29	0.003430	2.99	33.76	31.90	0.51			2.99	2.00
79.125*	101.0	5419.16	5421.07	5420.72	5421.25	0.005055	3.44	29.39	30.20	0.61			3.44	1.91
79.04	101.0	5419.17	5420.89	5420.76	5421.19	0.010103	4.46	22.63	26.39	0.85			4.46	1.71
78.77	101.0	5419.02	5420.55	5420.55	5420.90	0.013405	4.74	21.30	28.15	0.96			4.74	1.53
78.5	101.0	5418.74	5420.21	5420.05	5420.47	0.008905	4.14	24.42	29.17	0.80			4.14	1.47
78.375*	101.0	5418.54	5420.09	5419.92	5420.35	0.008506	4.08	24.73	29.07	0.78			4.08	1.55
78.25*	101.0	5418.35	5419.97	5419.81	5420.23	0.007942	4.07	24.83	27.86	0.76			4.07	1.62
78.125*	101.0	5418.15	5419.82	5419.67	5420.10	0.008709	4.30	23.48	25.90	0.80			4.30	1.67
78	101.0	5417.95	5419.57	5419.56	5419.98	0.013454	5.16	19.56	22.65	0.98			5.16	1.62
77.7966*	101.0	5417.52	5419.23	5419.23	5419.67	0.014797	5.34	18.90	22.35	1.02			5.34	1.71
77.5933*	101.0	5417.08	5418.75	5418.87	5419.33	0.020746	6.14	16.46	20.34	1.20			6.14	1.67
77.39	101.0	5416.65	5418.40	5418.49	5418.95	0.018437	5.97	16.93	19.93	1.14			5.97	1.75
77.2666*	101.0	5416.28	5417.95	5418.13	5418.67	0.025753	6.80	14.85	18.44	1.34			6.80	1.67
77.1433*	101.0	5415.91	5417.62	5417.78	5418.31	0.023924	6.69	15.11	18.20	1.29			6.69	1.71
77.02*	101.0	5415.54	5417.26	5417.43	5417.99	0.025042	6.87	14.70	17.55	1.32			6.87	1.71
76.8966*	101.0	5415.18	5417.39	5417.11	5417.67	0.006739	4.24	23.85	21.96	0.72			4.24	2.21
76.7733*	101.0	5414.81	5417.42	5416.79	5417.57	0.003035	3.18	31.76	24.66	0.49			3.18	2.60
76.65	101.0	5414.44	5417.43	5416.46	5417.53	0.001638	2.57	39.35	26.36	0.37			2.57	2.99
76.4666*	101.0	5414.50	5417.40	5416.41	5417.50	0.001506	2.46	41.14	27.81	0.36			2.46	2.90
76.2833*	101.0	5414.55	5417.38	5416.39	5417.47	0.001368	2.34	43.16	29.28	0.34			2.34	2.83
76.1	101.0	5414.61	5417.36	5416.40	5417.44	0.001263	2.24	45.03	30.74	0.33			2.24	2.75
75.984*	101.0	5414.62	5417.33	5416.46	5417.42	0.001617	2.46	41.00	29.26	0.37			2.46	2.71
75.868*	101.0	5414.64	5417.28	5416.52	5417.40	0.002219	2.76	36.53	27.79	0.42			2.76	2.64
75.752*	101.0	5414.65	5417.21	5416.59	5417.37	0.003144	3.19	31.69	25.20	0.50			3.19	2.56
75.6359*	101.0	5414.67	5417.12	5416.66	5417.33	0.004275	3.71	27.19	21.53	0.58			3.71	2.45
75.52	101.0	5414.68	5416.93	5416.72	5417.27	0.007847	4.68	21.60	19.04	0.77			4.68	2.25
75.3466*	101.0	5414.46	5416.78	5416.57	5417.12	0.007683	4.65	21.73	19.02	0.77			4.65	2.32
75.1733*	101.0	5414.24	5416.61	5416.36	5416.96	0.008395	4.75	21.28	19.24	0.80			4.75	2.36
75	101.0	5414.02	5416.39	5416.19	5416.80	0.008877	5.08	19.88	16.76	0.82			5.08	2.37
74.8*	101.0	5413.78	5416.23	5416.00	5416.57	0.009912	4.67	21.63	22.78	0.84			4.67	2.45
74.6*	101.0	5413.54	5416.04	5415.79	5416.34	0.010139	4.37	23.11	27.50	0.84			4.37	2.50
74.4	101.0	5413.30	5415.85	5415.61	5416.11	0.010219	4.09	24.68	32.73	0.83			4.09	2.55
74.2*	101.0	5413.27	5415.68	5415.23	5415.97	0.006320	4.33	23.33	19.43	0.70			4.33	2.41
74	101.0	5413.25	5415.62	5414.89	5415.85	0.003260	3.77	26.78	20.33	0.52			3.77	2.37
73.9166*	101.0	5413.20	5415.52	5415.01	5415.81	0.005371	4.32	23.39	17.11	0.65			4.32	2.32
73.8333*	101.0	5413.16	5415.43	5415.07	5415.77	0.007026	4.70	21.49	17.01	0.74			4.70	2.27
73.75	101.0	5413.11	5415.33	5415.05	5415.73	0.007694	5.01	20.15	15.45	0.77			5.01	2.22
73.5	101.0	5412.90	5415.21	5414.71	5415.54	0.005134	4.64	21.74	13.21	0.64			4.64	2.31
73.375*	101.0	5412.83	5415.11	5414.70	5415.48	0.006062	4.88	20.69	13.37	0.69			4.88	2.28
73.25	101.0	5412.76	5414.95	5414.70	5415.40	0.007932	5.37	18.81	12.95	0.78			5.37	2.19
73	101.0	5412.42	5414.85	5414.45	5415.20	0.005927	4.72	21.41	14.55	0.69			4.72	2.43
72.77	101.0	5412.16	5414.68	5414.23	5415.04	0.005688	4.82	20.97	13.12	0.67			4.82	2.52
72.615*	101.0	5412.04	5414.65	5414.06	5414.94	0.004455	4.29	23.56	17.60	0.60			4.29	2.61
72.46	101.0	5411.92	5414.65	5413.85	5414.84	0.003437	3.44	29.34	21.62	0.52			3.44	2.73
72.23	101.0	5411.71	5414.49	5413.92	5414.73	0.004466	3.97	25.41	18.46	0.60			3.97	2.78
72.1150*	101.0	5411.76	5414.42	5413.86	5414.69	0.004293	4.12	24.51	16.18	0.59			4.12	2.66
72	101.0	5411.82	5414.35	5413.74	5414.63	0.004456	4.26	23.72	15.11	0.60			4.26	2.53
71.78	101.0	5411.71	5413.91	5413.81	5414.46	0.010358	5.96	16.96	12.24	0.89			5.96	2.20
71.6866*	101.0	5411.68	5413.80	5413.74	5414.36	0.011615	5.98	16.89	13.46	0.94			5.98	2.12
71.5933*	101.0	5411.66	5413.69	5413.61	5414.22	0.011292	5.84	17.29	14.07	0.93			5.84	2.03
71.5	101.0	5411.63	5413.56	5413.49	5414.10	0.011551	5.94	17.01	13.50	0.93			5.94	1.92
71.375*	101.0	5411.50	5413.38	5413.34	5413.92	0.011506	5.91	17.10	13.83	0.94			5.91	1.88
71.25*	101.0	5411.37	5413.22	5413.15	5413.72	0.010981	5.68	17.79	14.92	0.92			5.68	1.85
71.125*	101.0	5411.23	5413.27	5412.97	5413.55	0.005918	4.25	23.79	19.58	0.68			4.25	2.04

Profile Output Table - No Name Arroyo Undisturbed Channel 2yr-6hr
 HEC-RAS Plan: Premine River: No Name Reach: Reach 1 Profile: PF 1

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Vel Lt (ft/s)	Vel Rt (ft/s)	Vel Total (ft/s)	Max Chnl Depth (ft)
71	101.0	5411.10	5413.34	5412.56	5413.47	0.002005	2.90	34.85	21.89	0.40			2.90	2.24
70.875*	101.0	5411.04	5412.86	5412.82	5413.38	0.011655	5.76	17.55	15.14	0.94			5.76	1.82
70.75	101.0	5410.97	5412.85	5412.57	5413.20	0.006742	4.71	21.43	16.54	0.73			4.71	1.88
70.65*	101.0	5410.80	5412.77	5412.50	5413.11	0.006965	4.70	21.50	17.17	0.74			4.70	1.97
70.55*	101.0	5410.62	5412.67	5412.41	5413.02	0.007294	4.72	21.40	17.62	0.75			4.72	2.05
70.45*	101.0	5410.45	5412.58	5412.35	5412.93	0.007473	4.74	21.29	26.40	0.76			4.74	2.13
70.35	101.0	5410.28	5412.73	5412.25	5412.81	0.002105	2.34	43.18	39.64	0.39			2.34	2.44
70.175*	101.0	5410.25	5412.58	5412.15	5412.75	0.004473	3.32	30.44	29.89	0.58			3.32	2.33
70	101.0	5410.21	5412.08	5412.08	5412.58	0.014488	5.69	17.74	28.29	1.02			5.69	1.87
69.75*	101.0	5409.81	5411.15	5411.41	5411.99	0.032304	7.36	13.72	18.00	1.49			7.36	1.34
69.5	101.0	5409.42	5411.66	5410.93	5411.79	0.002247	2.98	33.89	23.07	0.43			2.98	2.24
69.3333*	101.0	5409.23	5411.57	5410.83	5411.74	0.002751	3.34	30.20	19.92	0.48			3.34	2.34
69.1666*	101.0	5409.05	5411.47	5410.72	5411.68	0.003237	3.75	26.96	16.58	0.52			3.75	2.42
69	101.0	5408.86	5411.32	5410.71	5411.60	0.004121	4.27	23.66	14.31	0.58			4.27	2.46
68.75*	101.0	5408.79	5411.22	5410.69	5411.49	0.004526	4.16	24.26	16.38	0.60			4.16	2.43
68.5	101.0	5408.71	5411.04	5410.61	5411.37	0.005793	4.59	22.00	15.42	0.68			4.59	2.33
68.375*	101.0	5408.70	5411.00	5410.58	5411.28	0.005332	4.20	24.03	18.46	0.65			4.20	2.30
68.25	101.0	5408.69	5410.98	5410.33	5411.20	0.003729	3.70	27.31	19.40	0.55			3.70	2.29
68.13	101.0	5408.63	5410.95	5410.51	5411.14	0.004512	3.50	28.84	34.15	0.59			3.50	2.32
67.99	101.0	5408.63	5410.95	5410.15	5411.06	0.002348	2.75	36.67	29.27	0.43			2.75	2.32
67.89*	101.0	5408.63	5410.88	5410.24	5411.04	0.003248	3.19	31.65	25.80	0.51			3.19	2.25
67.79	101.0	5408.63	5410.73	5410.27	5410.99	0.005243	4.09	24.68	19.36	0.64			4.09	2.10
67.65	101.0	5408.40	5410.61	5410.23	5410.90	0.005865	4.34	23.26	18.18	0.68			4.34	2.21
67.4	101.0	5408.12	5410.49	5410.07	5410.75	0.005142	4.12	24.50	18.80	0.64			4.12	2.37
67.2*	101.0	5407.92	5410.39	5409.97	5410.64	0.005063	4.02	25.12	19.98	0.63			4.02	2.47
67	101.0	5407.73	5410.31	5409.80	5410.53	0.004032	3.77	26.81	19.73	0.57			3.77	2.58
66.75*	101.0	5407.68	5410.21	5409.71	5410.43	0.004334	3.74	26.99	21.36	0.59			3.74	2.53
66.5	101.0	5407.63	5410.13	5409.50	5410.32	0.003524	3.51	28.79	21.41	0.53			3.51	2.50
66.255*	101.0	5407.58	5410.00	5409.49	5410.22	0.004187	3.76	26.89	20.57	0.58			3.76	2.42
66.01	101.0	5407.52	5409.65	5409.52	5410.06	0.010183	5.11	19.77	18.02	0.86			5.11	2.13
65.84*	101.0	5407.39	5409.51	5409.35	5409.90	0.008595	4.97	20.30	17.32	0.81			4.97	2.12
65.67*	101.0	5407.25	5409.41	5409.14	5409.73	0.006778	4.56	22.16	18.18	0.73			4.56	2.16
65.5	101.0	5407.12	5409.35	5408.97	5409.61	0.005176	4.02	25.10	20.36	0.64			4.02	2.23
65.25*	101.0	5406.85	5409.23	5408.85	5409.47	0.005283	3.94	25.66	21.79	0.64			3.94	2.38
65	101.0	5406.58	5408.96	5408.75	5409.30	0.008091	4.70	21.48	18.91	0.78			4.70	2.38
64.8*	101.0	5406.58	5408.92	5408.50	5409.14	0.004494	3.79	26.63	21.14	0.60			3.79	2.33
64.6*	101.0	5406.58	5408.88	5408.25	5409.05	0.002941	3.29	30.70	21.99	0.49			3.29	2.30
64.4	101.0	5406.58	5408.85	5408.04	5408.99	0.002180	3.00	33.64	21.89	0.43			3.00	2.27
64.175*	101.0	5406.38	5408.81	5408.16	5408.93	0.002508	2.81	35.95	28.91	0.44			2.81	2.43
63.95	101.0	5406.17	5408.39	5408.21	5408.80	0.008739	5.14	19.64	27.90	0.82			5.14	2.22
63.7633*	101.0	5405.99	5408.33	5408.05	5408.58	0.008267	4.01	25.21	28.97	0.76			4.01	2.34
63.5766*	101.0	5405.81	5408.16	5407.95	5408.43	0.007512	4.13	24.47	25.26	0.74			4.13	2.35
63.39	101.0	5405.63	5408.01	5407.74	5408.28	0.006932	4.17	24.23	23.32	0.72			4.17	2.38
63.2066*	101.0	5405.46	5407.87	5407.61	5408.13	0.007718	4.10	24.61	26.34	0.75			4.10	2.41
63.0233*	101.0	5405.30	5407.86	5407.43	5408.00	0.003685	3.03	33.37	32.41	0.53			3.03	2.56
62.84	101.0	5405.13	5407.87	5406.99	5407.94	0.001306	2.13	47.51	35.78	0.33			2.13	2.74
62.6	101.0	5405.13	5407.86	5406.97	5407.91	0.000881	1.77	57.04	42.39	0.27			1.77	2.73
62.475*	101.0	5405.13	5407.79	5407.16	5407.89	0.002162	2.55	39.62	33.45	0.41			2.55	2.66
62.35	101.0	5405.13	5407.72	5407.06	5407.86	0.002470	2.97	34.06	24.74	0.45			2.97	2.59
62.175*	101.0	5405.10	5407.62	5407.07	5407.81	0.003762	3.49	28.95	22.84	0.55			3.49	2.52
62	101.0	5405.08	5407.53	5406.98	5407.74	0.003869	3.63	27.82	20.93	0.55			3.63	2.45
61.75*	101.0	5405.03	5407.25	5407.08	5407.60	0.008487	4.70	21.48	19.98	0.80			4.70	2.22
61.5	101.0	5404.98	5407.15	5406.76	5407.39	0.005082	3.96	25.52	20.83	0.63			3.96	2.17
61.25*	101.0	5404.82	5406.96	5406.73	5407.25	0.007170	4.33	23.34	21.78	0.74			4.33	2.14
61	101.0	5404.66	5406.84	5406.48	5407.06	0.005437	3.78	26.70	24.85	0.64			3.78	2.18
60.75*	101.0	5404.53	5406.76	5406.36	5406.92	0.004150	3.25	31.10	29.89	0.56			3.25	2.23
60.5	101.0	5404.39	5406.69	5406.19	5406.82	0.002873	2.87	35.14	30.70	0.47			2.87	2.30
60.25*	101.0	5404.26	5406.57	5406.09	5406.74	0.003615	3.30	30.65	25.84	0.53			3.30	2.31
60	101.0	5404.13	5406.45	5405.94	5406.64	0.003682	3.54	28.52	21.71	0.54			3.54	2.31
59.75*	101.0	5404.00	5406.36	5405.77	5406.54	0.003461	3.39	29.81	23.20	0.53			3.39	2.36
59.5	101.0	5403.88	5406.26	5405.73	5406.45	0.003638	3.47	29.09	22.42	0.54			3.47	2.38
59.25*	101.0	5403.84	5406.10	5405.70	5406.34	0.005246	3.92	25.78	22.03	0.64			3.92	2.26
59	101.0	5403.80	5405.92	5405.59	5406.20	0.006118	4.25	23.78	19.99	0.69			4.25	2.12
58.82*	101.0	5403.67	5405.82	5405.45	5406.08	0.005993	4.05	24.92	22.33	0.68			4.05	2.15
58.64*	101.0	5403.54	5405.74	5405.34	5405.96	0.004904	3.75	26.91	23.39	0.62			3.75	2.20
58.46	101.0	5403.41	5405.69	5405.17	5405.87	0.003633	3.41	29.66	29.46	0.54			3.41	2.28
58.23*	101.0	5403.30	5405.60	5405.03	5405.78	0.003439	3.41	29.63	25.20	0.53			3.41	2.30
58	101.0	5403.19	5405.53	5404.88	5405.70	0.003093	3.35	30.13	27.37	0.50			3.35	2.34
57.8825*	101.0	5403.17	5405.49	5404.91	5405.66	0.003244	3.34	30.19	25.98	0.51			3.34	2.32
57.765*	101.0	5403.16	5405.45	5404.89	5405.62	0.003342	3.33	30.36	23.74	0.52			3.33	2.29
57.6475*	101.0	5403.14	5405.41	5404.85	5405.58	0.003493	3.33	30.35	36.25	0.53			3.33	2.27

Profile Output Table - No Name Arroyo Undisturbed Channel 2yr-6hr
 HEC-RAS Plan: Premine River: No Name Reach: Reach 1 Profile: PF 1

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Vel Lt (ft/s)	Vel Rt (ft/s)	Vel Total (ft/s)	Max Chnl Depth (ft)
57.53	101.0	5403.12	5405.36	5404.79	5405.54	0.003732	3.37	29.99	45.22	0.54			3.37	2.24
57.38	101.0	5403.07	5405.31	5404.79	5405.49	0.003380	3.40	30.38	37.99	0.52		0.65	3.32	2.24
57.23	101.0	5403.06	5405.33	5404.53	5405.42	0.001660	2.42	41.73	31.36	0.37			2.42	2.27
57	101.0	5403.03	5405.22	5404.56	5405.37	0.002548	3.12	32.34	22.55	0.46			3.12	2.19
56.75*	101.0	5402.90	5405.12	5404.49	5405.29	0.003067	3.36	30.06	21.58	0.50			3.36	2.22
56.5	101.0	5402.77	5405.03	5404.44	5405.21	0.003220	3.40	29.72	21.73	0.51			3.40	2.26
56.375*	101.0	5402.67	5404.97	5404.40	5405.16	0.003448	3.47	29.10	21.70	0.53			3.47	2.30
56.25*	101.0	5402.58	5404.91	5404.38	5405.10	0.003715	3.54	28.52	21.82	0.55			3.54	2.33
56.125*	101.0	5402.48	5404.84	5404.33	5405.05	0.003994	3.61	27.97	21.93	0.56			3.61	2.36
56	101.0	5402.38	5404.78	5404.29	5404.98	0.004121	3.67	27.51	21.47	0.57			3.67	2.40
55.875*	101.0	5402.38	5404.73	5404.24	5404.93	0.004033	3.66	27.60	21.31	0.57			3.66	2.35
55.75*	101.0	5402.38	5404.68	5404.16	5404.88	0.003851	3.63	27.83	20.97	0.56			3.63	2.30
55.625*	101.0	5402.38	5404.63	5404.10	5404.84	0.003660	3.61	27.97	20.36	0.54			3.61	2.25
55.5	101.0	5402.38	5404.59	5404.03	5404.79	0.003460	3.58	28.22	19.84	0.53			3.58	2.21
55.375*	101.0	5402.38	5404.57	5404.00	5404.74	0.003081	3.30	30.63	22.55	0.50			3.30	2.19
55.25*	101.0	5402.38	5404.55	5403.97	5404.69	0.002836	3.08	32.76	25.24	0.48			3.08	2.17
55.125*	101.0	5402.38	5404.52	5403.98	5404.65	0.002723	2.93	34.49	27.97	0.46			2.93	2.14
55	101.0	5402.38	5404.49	5403.97	5404.62	0.002662	2.81	35.98	30.66	0.46			2.81	2.11
54.875*	101.0	5402.38	5404.45	5403.96	5404.58	0.002930	2.92	34.64	30.02	0.48			2.92	2.07
54.75*	101.0	5402.38	5404.40	5403.94	5404.54	0.003234	3.03	33.34	29.41	0.50			3.03	2.02
54.625*	101.0	5402.37	5404.34	5403.91	5404.50	0.003633	3.17	31.90	28.75	0.53			3.17	1.97
54.5	101.0	5402.37	5404.28	5403.88	5404.45	0.004164	3.33	30.32	28.05	0.56			3.33	1.91
54.25*	101.0	5402.29	5404.19	5403.75	5404.35	0.003782	3.28	30.80	27.13	0.54			3.28	1.90
54	101.0	5402.20	5404.07	5403.57	5404.25	0.004337	3.42	29.56	33.01	0.57			3.42	1.87
53.8233*	101.0	5402.10	5404.00	5403.53	5404.17	0.004068	3.29	30.70	70.08	0.56			3.29	1.90
53.6466*	101.0	5402.01	5403.94	5403.48	5404.09	0.003981	3.18	31.74	81.09	0.55			3.18	1.93
53.47	101.0	5401.91	5403.87	5403.45	5404.02	0.003904	3.07	33.19	119.42	0.54		0.45	3.04	1.96
Max							7.36						Avg	4.07
Min							1.94							
Avg							4.07							

The undisturbed channel reaches following outside of the reconstructed channel reaches were not included in determining the maximum, minimum, and average velocities. The reconstructed reaches are from Station 81.50 to 72.23 and from Station 71.00 to 67.00.

Profile Output Table - No Name Arroyo Undisturbed Channel 10yr-6hr
 HEC-RAS Plan: Premine River: No Name Reach: Reach 1 Profile: PF 2

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Vel Lt (ft/s)	Vel Rt (ft/s)	Vel Total (ft/s)	Max Chnl Depth (ft)
92	412.0	5430.37	5435.79	5431.87	5435.81	0.000108	1.29	318.36	77.61	0.11			1.29	5.42
91.8925*	412.0	5430.22	5435.77	5432.13	5435.81	0.000168	1.58	260.77	65.24	0.14			1.58	5.55
91.785*	412.0	5430.07	5435.74	5432.40	5435.81	0.000279	1.98	207.96	53.45	0.18			1.98	5.67
91.6775*	412.0	5429.92	5435.69	5432.70	5435.80	0.000506	2.58	159.54	42.25	0.23			2.58	5.77
91.57	412.0	5429.77	5435.58	5433.07	5435.78	0.001087	3.60	114.44	31.51	0.33			3.60	5.81
91.465*	412.0	5429.59	5435.48	5433.41	5435.76	0.001623	4.22	97.65	28.57	0.40			4.22	5.89
91.36*	412.0	5429.42	5435.33	5433.75	5435.72	0.002558	5.01	82.31	26.19	0.50			5.01	5.91
91.255*	412.0	5429.25	5435.10	5434.02	5435.68	0.004130	6.07	67.82	23.05	0.62	0.10		6.07	5.85
91.15	412.0	5429.07	5434.27	5434.27	5435.54	0.011466	9.05	45.52	17.53	0.99			9.05	5.20
91.0533*	412.0	5428.81	5432.88	5433.67	5435.28	0.029861	12.44	33.13	17.04	1.57			12.44	4.06
90.9566*	412.0	5428.55	5432.33	5433.18	5434.92	0.037019	12.91	31.92	18.60	1.74			12.91	3.78
90.86	412.0	5428.29	5431.92	5432.82	5434.55	0.034514	13.00	31.68	17.33	1.69			13.00	3.63
90.6	412.0	5427.43	5430.88	5431.76	5433.62	0.036034	13.28	31.02	16.99	1.73			13.28	3.45
90.45*	412.0	5426.88	5429.96	5430.92	5432.97	0.046591	13.93	29.58	18.73	1.95			13.93	3.08
90.3	412.0	5426.33	5428.97	5429.97	5432.19	0.053763	14.39	28.63	19.38	2.09			14.39	2.64
90.2*	412.0	5426.29	5428.40	5429.33	5431.57	0.069995	14.29	28.83	24.72	2.33			14.29	2.11
90.1*	412.0	5426.25	5428.00	5428.76	5430.68	0.076535	13.15	31.32	32.93	2.38			13.15	1.75
90	412.0	5426.21	5427.63	5428.27	5429.79	0.069611	11.79	34.93	40.39	2.23			11.79	1.42
89.875*	412.0	5425.98	5427.73	5428.11	5429.03	0.029351	9.15	45.00	39.83	1.52			9.15	1.75
89.75*	412.0	5425.75	5428.18	5427.94	5428.74	0.007704	6.02	68.40	41.42	0.83			6.02	2.43
89.625*	412.0	5425.52	5427.98	5427.85	5428.61	0.008601	6.37	64.69	39.05	0.87			6.37	2.46
89.5	412.0	5425.29	5427.71	5427.66	5428.49	0.011324	7.09	58.14	36.57	0.99			7.09	2.41
89.4166*	412.0	5425.08	5427.68	5427.52	5428.33	0.008673	6.48	63.59	37.47	0.88			6.48	2.59
89.3333*	412.0	5424.87	5427.73	5427.35	5428.21	0.005676	5.57	73.90	39.64	0.72			5.57	2.86
89.25	412.0	5424.66	5427.77	5427.09	5428.14	0.003690	4.91	83.94	39.19	0.59			4.91	3.11
89.125*	412.0	5424.40	5427.85	5426.89	5428.06	0.002127	3.69	111.50	53.42	0.45			3.69	3.45
89	412.0	5424.13	5427.85	5426.55	5428.02	0.001540	3.29	125.38	64.24	0.39			3.29	3.72
88.8266*	412.0	5423.95	5427.83	5426.73	5427.99	0.001951	3.17	129.80	73.64	0.42			3.17	3.88
88.6533*	412.0	5423.77	5427.77	5426.78	5427.95	0.002570	3.34	123.36	79.86	0.47			3.34	4.00
88.48	412.0	5423.59	5427.69	5426.80	5427.89	0.002680	3.62	113.68	66.98	0.49			3.62	4.10
88.2400*	412.0	5423.60	5427.64	5426.78	5427.83	0.002155	3.46	118.93	63.67	0.45			3.46	4.04
88	412.0	5423.60	5427.42	5426.50	5427.75	0.002888	4.64	88.87	37.41	0.53			4.64	3.82
87.875*	412.0	5423.66	5427.34	5426.58	5427.72	0.003473	4.94	83.35	36.75	0.58			4.94	3.68
87.75*	412.0	5423.72	5427.24	5426.64	5427.68	0.004218	5.29	77.87	35.98	0.63			5.29	3.52
87.625*	412.0	5423.78	5427.12	5426.64	5427.63	0.005186	5.69	72.39	35.04	0.70			5.69	3.34
87.5	412.0	5423.84	5426.82	5426.65	5427.52	0.008381	6.72	61.28	33.13	0.87			6.72	2.97
87.3333*	412.0	5423.84	5426.75	5426.44	5427.35	0.006903	6.24	66.04	34.61	0.80			6.24	2.90
87.1666*	412.0	5423.84	5426.69	5426.25	5427.21	0.005616	5.79	71.14	35.64	0.72			5.79	2.85
87	412.0	5423.84	5426.64	5426.07	5427.10	0.004669	5.42	75.99	36.41	0.66			5.42	2.80
86.74	412.0	5423.82	5426.57	5426.02	5426.96	0.004296	4.99	82.49	42.16	0.63			4.99	2.75
86.62*	412.0	5423.73	5426.58	5426.07	5426.86	0.004192	4.31	95.54	60.23	0.60			4.31	2.85
86.5	412.0	5423.64	5426.23	5426.23	5426.75	0.013338	5.82	70.73	67.72	1.00			5.82	2.59
86.3849*	412.0	5423.55	5425.46	5425.77	5426.51	0.033546	8.20	50.26	57.81	1.55			8.20	1.91
86.27	412.0	5423.47	5426.02	5425.38	5426.35	0.003511	4.56	90.37	47.09	0.57			4.56	2.55
86.1349*	412.0	5423.31	5425.88	5425.41	5426.28	0.004744	5.08	81.06	43.34	0.65			5.08	2.57
86	412.0	5423.15	5425.64	5425.40	5426.20	0.007582	5.98	68.85	40.97	0.81			5.98	2.49
85.8*	412.0	5422.90	5425.59	5425.20	5426.03	0.005480	5.35	77.02	42.74	0.70			5.35	2.69
85.6	412.0	5422.64	5425.56	5424.98	5425.91	0.004061	4.80	85.83	44.74	0.61			4.80	2.92
85.35*	412.0	5422.58	5425.45	5424.86	5425.81	0.004102	4.84	85.04	44.16	0.62			4.84	2.87
85.1*	412.0	5422.52	5425.34	5424.74	5425.71	0.004061	4.87	84.59	43.14	0.61			4.87	2.82
84.85	412.0	5422.46	5425.24	5424.68	5425.61	0.004050	4.88	84.35	42.70	0.61			4.88	2.78
84.6833*	412.0	5422.36	5425.17	5424.70	5425.53	0.004504	4.79	86.09	49.13	0.64			4.79	2.81
84.5166*	412.0	5422.27	5424.95	5424.79	5425.42	0.008486	5.51	74.71	55.80	0.84			5.51	2.68
84.35	412.0	5422.17	5424.71	5424.61	5425.29	0.009953	6.11	67.40	48.03	0.91			6.11	2.54
84.2333*	412.0	5422.17	5424.85	5424.40	5425.12	0.004568	4.12	99.92	72.49	0.62			4.12	2.68
84.1166*	412.0	5422.17	5424.83	5424.26	5425.05	0.003494	3.80	108.53	86.13	0.55			3.80	2.66
84	412.0	5422.17	5424.84	5424.11	5425.00	0.002296	3.22	128.13	80.89	0.45			3.22	2.66
83.75	412.0	5422.39	5424.71	5424.28	5424.92	0.004033	3.68	111.83	160.91	0.58			3.68	2.32
83.625*	412.0	5422.08	5424.79	5423.63	5424.86	0.000747	1.99	206.61	115.26	0.26			1.99	2.71
83.5	412.0	5421.77	5424.82	5423.07	5424.84	0.000208	1.19	344.85	158.58	0.14			1.19	3.05
83.3849*	412.0	5421.42	5424.78	5423.13	5424.83	0.000459	1.84	223.53	96.98	0.21			1.84	3.36
83.27	412.0	5421.08	5424.53	5423.58	5424.80	0.002369	4.20	98.19	41.75	0.48			4.20	3.45
83	412.0	5420.96	5424.46	5423.53	5424.73	0.002441	4.14	99.43	43.93	0.49			4.14	3.50
82.8825*	412.0	5420.96	5424.52	5423.30	5424.67	0.001360	3.16	130.52	56.60	0.37			3.16	3.56
82.765*	412.0	5420.96	5424.54	5423.15	5424.64	0.000959	2.63	156.39	68.75	0.31			2.63	3.57
82.6475*	412.0	5420.97	5424.54	5423.05	5424.62	0.000774	2.32	177.51	80.47	0.28			2.32	3.57
82.53	412.0	5420.97	5424.54	5422.94	5424.61	0.000681	2.12	194.33	91.73	0.26			2.12	3.57
82.3999*	412.0	5420.95	5424.51	5422.92	5424.60	0.000732	2.44	169.05	67.98	0.27			2.44	3.56
82.27	412.0	5420.93	5424.38	5423.05	5424.58	0.001471	3.52	117.01	44.40	0.38			3.52	3.45
82.1349*	412.0	5421.01	5424.28	5423.26	5424.55	0.002270	4.13	99.79	41.60	0.47			4.13	3.27
82	412.0	5421.09	5424.08	5423.51	5424.49	0.004296	5.17	79.73	38.52	0.63			5.17	2.99

Profile Output Table - No Name Arroyo Undisturbed Channel 10yr-6hr
 HEC-RAS Plan: Premine River: No Name Reach: Reach 1 Profile: PF 2

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Vel Lt (ft/s)	Vel Rt (ft/s)	Vel Total (ft/s)	Max Chnl Depth (ft)
81.875*	412.0	5421.00	5423.99	5423.48	5424.43	0.004767	5.30	77.74	39.34	0.66			5.30	2.99
81.75*	412.0	5420.92	5423.91	5423.48	5424.37	0.005383	5.45	75.58	40.39	0.70			5.45	2.99
81.625*	412.0	5420.83	5423.80	5423.49	5424.29	0.006143	5.62	73.33	41.47	0.74			5.62	2.97
81.5	412.0	5420.74	5423.46	5423.46	5424.16	0.011147	6.74	61.12	41.18	0.97			6.74	2.72
81.25	412.0	5420.44	5423.40	5423.07	5423.85	0.006287	5.43	75.89	115.60	0.75			5.43	2.96
81.125*	412.0	5420.06	5423.54	5422.64	5423.72	0.002100	3.45	119.39	63.19	0.44			3.45	3.48
81	412.0	5419.68	5423.58	5422.19	5423.68	0.001051	2.56	160.87	79.36	0.32			2.56	3.90
80.875*	412.0	5419.60	5423.49	5422.33	5423.66	0.001638	3.29	125.26	58.99	0.40			3.29	3.89
80.75	412.0	5419.53	5423.20	5422.59	5423.60	0.004187	5.06	81.41	40.20	0.63			5.06	3.67
80.5	412.0	5419.47	5422.98	5422.55	5423.49	0.005637	5.72	72.09	37.00	0.72			5.72	3.51
80.25*	412.0	5419.47	5422.87	5422.36	5423.34	0.005004	5.52	74.61	36.80	0.68			5.52	3.40
80	412.0	5419.47	5422.78	5422.17	5423.21	0.004241	5.25	78.47	36.72	0.63			5.25	3.31
79.775*	412.0	5419.29	5422.79	5421.91	5423.10	0.002799	4.49	91.81	39.82	0.52			4.49	3.50
79.55	412.0	5419.11	5422.80	5421.61	5423.02	0.001865	3.84	107.23	43.72	0.43			3.84	3.69
79.465*	412.0	5419.12	5422.75	5421.70	5423.01	0.002133	4.05	101.80	42.10	0.46			4.05	3.63
79.38*	412.0	5419.13	5422.70	5421.74	5422.99	0.002493	4.29	96.01	40.95	0.49			4.29	3.57
79.295*	412.0	5419.14	5422.64	5421.79	5422.96	0.002963	4.57	90.11	39.83	0.54			4.57	3.50
79.21*	412.0	5419.15	5422.56	5421.84	5422.94	0.003631	4.92	83.72	38.64	0.59			4.92	3.41
79.125*	412.0	5419.16	5422.44	5421.89	5422.90	0.004804	5.43	75.85	37.26	0.67			5.43	3.28
79.04	412.0	5419.17	5421.97	5421.97	5422.81	0.011595	7.36	55.96	33.84	1.01			7.36	2.80
78.77	412.0	5419.02	5421.45	5421.64	5422.45	0.016897	8.05	51.21	36.20	1.19			8.05	2.43
78.5	412.0	5418.74	5421.67	5421.23	5422.09	0.005178	5.18	79.49	44.85	0.69			5.18	2.93
78.375*	412.0	5418.54	5421.58	5421.10	5422.00	0.005041	5.21	79.06	43.28	0.68			5.21	3.04
78.25*	412.0	5418.35	5421.48	5421.00	5421.92	0.005181	5.34	77.19	41.49	0.69			5.34	3.13
78.125*	412.0	5418.15	5421.32	5420.92	5421.82	0.005934	5.68	72.59	39.22	0.74			5.68	3.17
78	412.0	5417.95	5420.85	5420.85	5421.69	0.011753	7.35	56.06	34.14	1.01			7.35	2.90
77.7966*	412.0	5417.52	5420.21	5420.51	5421.38	0.021075	8.69	47.42	35.27	1.32			8.69	2.69
77.5933*	412.0	5417.08	5420.34	5420.16	5421.04	0.008664	6.71	61.38	34.17	0.88			6.71	3.26
77.39	412.0	5416.65	5419.91	5419.91	5420.82	0.010892	7.66	53.79	28.70	0.99			7.66	3.26
77.2666*	412.0	5416.28	5419.19	5419.52	5420.55	0.019563	9.36	44.01	27.19	1.30			9.36	2.91
77.1433*	412.0	5415.91	5418.73	5419.19	5420.30	0.024459	10.07	40.91	26.90	1.44			10.07	2.82
77.02*	412.0	5415.54	5418.41	5418.84	5419.94	0.023811	9.93	41.49	27.35	1.42			9.93	2.87
76.8966*	412.0	5415.18	5419.25	5418.53	5419.69	0.003914	5.32	77.50	33.25	0.61			5.32	4.07
76.7733*	412.0	5414.81	5419.28	5418.22	5419.63	0.002604	4.71	87.52	32.83	0.51			4.71	4.47
76.65	412.0	5414.44	5419.29	5417.93	5419.58	0.001980	4.36	94.57	31.85	0.45			4.36	4.85
76.4666*	412.0	5414.50	5419.28	5417.85	5419.54	0.001749	4.06	101.44	35.19	0.42			4.06	4.78
76.2833*	412.0	5414.55	5419.27	5417.78	5419.49	0.001545	3.78	108.94	38.72	0.40			3.78	4.72
76.1	412.0	5414.61	5419.26	5417.69	5419.46	0.001362	3.53	116.56	43.81	0.37			3.53	4.65
75.984*	412.0	5414.62	5419.21	5417.82	5419.44	0.001702	3.84	107.26	40.34	0.42			3.84	4.59
75.868*	412.0	5414.64	5419.14	5417.92	5419.41	0.002159	4.22	97.68	38.19	0.46			4.22	4.50
75.752*	412.0	5414.65	5419.04	5418.02	5419.38	0.002817	4.69	87.83	35.62	0.53			4.69	4.39
75.6359*	412.0	5414.67	5418.90	5418.13	5419.34	0.003989	5.35	77.04	33.18	0.62			5.35	4.23
75.52	412.0	5414.68	5418.30	5418.30	5419.23	0.010841	7.70	53.48	28.10	0.98			7.70	3.62
75.3466*	412.0	5414.46	5417.91	5418.11	5418.97	0.015456	8.24	49.97	31.28	1.15			8.24	3.45
75.1733*	412.0	5414.24	5417.69	5417.87	5418.62	0.016914	7.74	53.20	39.38	1.17			7.74	3.45
75	412.0	5414.02	5417.26	5417.48	5418.24	0.025018	7.95	51.83	49.65	1.37			7.95	3.24
74.8*	412.0	5413.78	5417.70	5417.31	5418.06	0.005335	4.80	85.81	54.95	0.68			4.80	3.92
74.6*	412.0	5413.54	5417.67	5417.01	5417.95	0.003642	4.24	97.27	56.51	0.57			4.24	4.13
74.4	412.0	5413.30	5417.66	5416.74	5417.87	0.002348	3.68	112.02	57.86	0.47			3.68	4.36
74.2*	412.0	5413.27	5417.60	5416.67	5417.82	0.002548	3.77	109.24	57.82	0.48			3.77	4.33
74	412.0	5413.25	5417.50	5416.62	5417.77	0.002884	4.10	100.38	62.11	0.51			4.10	4.25
73.9166*	412.0	5413.20	5417.44	5416.64	5417.74	0.003348	4.39	93.77	74.74	0.55			4.39	4.24
73.8333*	412.0	5413.16	5417.35	5416.65	5417.71	0.004067	4.82	85.46	77.25	0.61			4.82	4.19
73.75	412.0	5413.11	5417.19	5416.71	5417.68	0.005450	5.59	73.67	71.11	0.70			5.59	4.08
73.5	412.0	5412.90	5416.89	5416.57	5417.53	0.007204	6.40	64.34	53.95	0.79			6.40	3.99
73.375*	412.0	5412.83	5416.93	5416.48	5417.38	0.005188	5.40	76.33	38.92	0.68			5.40	4.10
73.25	412.0	5412.76	5416.96	5416.33	5417.27	0.003686	4.51	91.30	47.26	0.57			4.51	4.20
73	412.0	5412.42	5416.70	5416.18	5417.15	0.004782	5.35	77.00	37.53	0.66			5.35	4.28
72.77	412.0	5412.16	5416.64	5416.08	5417.02	0.004436	4.97	82.98	42.50	0.63			4.97	4.48
72.615*	412.0	5412.04	5416.53	5415.80	5416.95	0.003979	5.17	79.64	35.07	0.60			5.17	4.49
72.46	412.0	5411.92	5416.41	5415.55	5416.88	0.003808	5.53	74.53	31.64	0.60			5.53	4.49
72.23	412.0	5411.71	5416.28	5415.70	5416.77	0.004909	5.63	73.16	42.67	0.67			5.63	4.56
72.1150*	412.0	5411.76	5416.01	5415.70	5416.68	0.007614	6.57	62.70	31.91	0.83			6.57	4.25
72	412.0	5411.82	5415.87	5415.63	5416.60	0.008129	6.88	59.86	29.66	0.85			6.88	4.05
71.78	412.0	5411.71	5415.64	5415.64	5416.37	0.012247	6.86	60.07	41.55	1.01			6.86	3.93
71.6866*	412.0	5411.68	5415.27	5415.52	5416.23	0.019426	7.86	52.42	41.97	1.24			7.86	3.59
71.5933*	412.0	5411.66	5415.54	5415.38	5416.03	0.008502	5.60	73.51	52.63	0.84			5.60	3.88
71.5	412.0	5411.63	5415.52	5415.24	5415.91	0.006497	5.05	81.57	55.23	0.73			5.05	3.89
71.375*	412.0	5411.50	5415.39	5415.11	5415.82	0.007024	5.30	77.73	52.21	0.77			5.30	3.89
71.25*	412.0	5411.37	5415.30	5415.01	5415.72	0.006315	5.23	78.84	50.03	0.73			5.23	3.93
71.125*	412.0	5411.23	5415.26	5414.76	5415.62	0.004539	4.81	85.62	47.26	0.63			4.81	4.03

Profile Output Table - No Name Arroyo Undisturbed Channel 10yr-6hr
 HEC-RAS Plan: Premine River: No Name Reach: Reach 1 Profile: PF 2

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Vel Lt (ft/s)	Vel Rt (ft/s)	Vel Total (ft/s)	Max Chnl Depth (ft)
71	412.0	5411.10	5415.26	5414.01	5415.54	0.002986	4.30	95.75	44.30	0.52			4.30	4.16
70.875*	412.0	5411.04	5415.16	5414.46	5415.50	0.004220	4.64	88.78	49.87	0.61			4.64	4.12
70.75	412.0	5410.97	5414.29	5414.29	5415.35	0.010640	8.26	49.90	33.31	0.99			8.26	3.32
70.65*	412.0	5410.80	5413.95	5414.34	5415.18	0.016095	8.91	46.22	31.70	1.19			8.91	3.15
70.55*	412.0	5410.62	5413.55	5414.06	5414.97	0.028716	9.57	43.05	34.61	1.51			9.57	2.93
70.45*	412.0	5410.45	5413.11	5413.69	5414.66	0.038694	10.01	41.17	38.56	1.71			10.01	2.66
70.35	412.0	5410.28	5413.93	5413.19	5414.18	0.003306	4.04	101.89	57.76	0.54			4.04	3.65
70.175*	412.0	5410.25	5413.77	5413.36	5414.11	0.005045	4.71	87.40	55.19	0.66			4.71	3.52
70	412.0	5410.21	5413.72	5413.11	5414.02	0.003664	4.39	93.75	50.68	0.57			4.39	3.51
69.75*	412.0	5409.81	5413.69	5412.71	5413.94	0.002319	3.97	103.77	47.11	0.47			3.97	3.88
69.5	412.0	5409.42	5413.54	5412.43	5413.86	0.003411	4.50	91.46	45.34	0.56			4.50	4.12
69.3333*	412.0	5409.23	5413.45	5412.65	5413.78	0.003763	4.67	88.31	44.91	0.59			4.67	4.22
69.1666*	412.0	5409.05	5413.33	5412.69	5413.71	0.004087	4.89	84.21	42.20	0.61			4.89	4.28
69	412.0	5408.86	5413.16	5412.64	5413.62	0.005002	5.39	76.46	37.77	0.67			5.39	4.30
68.75*	412.0	5408.79	5413.06	5412.44	5413.48	0.005099	5.21	79.03	42.56	0.67			5.21	4.26
68.5	412.0	5408.71	5412.92	5412.37	5413.36	0.004842	5.31	77.66	46.01	0.66			5.31	4.21
68.375*	412.0	5408.70	5412.86	5412.19	5413.30	0.004660	5.32	77.44	45.48	0.66			5.32	4.16
68.25	412.0	5408.69	5412.87	5412.10	5413.21	0.003406	4.65	88.69	51.22	0.57			4.65	4.18
68.13	412.0	5408.63	5412.98	5411.57	5413.13	0.001183	3.08	133.80	52.68	0.34			3.08	4.35
67.99	412.0	5408.63	5412.91	5411.58	5413.11	0.002024	3.55	116.17	56.31	0.44			3.55	4.28
67.89*	412.0	5408.63	5412.81	5411.67	5413.08	0.002366	4.21	97.92	41.11	0.48			4.21	4.18
67.79	412.0	5408.63	5412.46	5411.86	5413.02	0.004885	6.00	68.65	27.97	0.68			6.00	3.83
67.65	412.0	5408.40	5412.20	5411.85	5412.93	0.006937	6.89	59.79	25.83	0.80			6.89	3.80
67.4	412.0	5408.12	5412.20	5411.69	5412.71	0.005415	5.76	71.48	34.01	0.70			5.76	4.08
67.2*	412.0	5407.92	5412.15	5411.55	5412.59	0.004397	5.31	77.57	36.37	0.64			5.31	4.23
67	412.0	5407.73	5412.10	5411.42	5412.50	0.003800	5.02	82.14	37.68	0.60			5.02	4.37
66.75*	412.0	5407.68	5412.01	5411.23	5412.40	0.003663	5.03	81.88	36.52	0.59			5.03	4.33
66.5	412.0	5407.63	5411.90	5411.10	5412.31	0.003781	5.17	79.76	34.95	0.60			5.17	4.27
66.255*	412.0	5407.58	5411.70	5411.08	5412.21	0.004816	5.71	72.17	32.46	0.67			5.71	4.12
66.01	412.0	5407.52	5411.47	5411.06	5412.08	0.006214	6.24	66.04	30.23	0.74			6.24	3.95
65.84*	412.0	5407.39	5411.08	5410.94	5411.92	0.009423	7.34	56.12	28.37	0.92			7.34	3.69
65.67*	412.0	5407.25	5410.87	5410.72	5411.72	0.009287	7.40	55.64	27.77	0.92			7.40	3.62
65.5	412.0	5407.12	5410.89	5410.50	5411.52	0.006225	6.38	64.54	29.67	0.76			6.38	3.77
65.25*	412.0	5406.85	5410.84	5410.34	5411.34	0.005265	5.71	72.16	34.84	0.70			5.71	3.99
65	412.0	5406.58	5410.40	5410.33	5411.14	0.010119	6.90	59.68	35.19	0.93			6.90	3.82
64.8*	412.0	5406.58	5410.27	5410.04	5410.93	0.007837	6.51	63.29	33.92	0.84			6.51	3.69
64.6*	412.0	5406.58	5410.15	5409.80	5410.76	0.006951	6.31	65.26	33.54	0.80			6.31	3.56
64.4	412.0	5406.58	5410.01	5409.66	5410.63	0.006868	6.32	65.22	33.05	0.79			6.32	3.43
64.175*	412.0	5406.38	5410.06	5409.50	5410.43	0.004520	4.88	84.44	46.45	0.64			4.88	3.68
63.95	412.0	5406.17	5410.10	5409.32	5410.31	0.002599	3.63	113.47	63.90	0.48			3.63	3.93
63.7633*	412.0	5405.99	5410.00	5409.31	5410.24	0.003161	3.99	103.28	58.93	0.53			3.99	4.00
63.5766*	412.0	5405.81	5409.86	5409.24	5410.16	0.003810	4.37	94.28	54.25	0.58			4.37	4.05
63.39	412.0	5405.63	5409.73	5409.13	5410.07	0.004314	4.71	87.54	49.52	0.62			4.71	4.09
63.2066*	412.0	5405.46	5409.71	5408.90	5409.98	0.003095	4.22	97.74	50.82	0.54			4.22	4.25
63.0233*	412.0	5405.30	5409.71	5408.60	5409.92	0.001988	3.69	111.77	50.80	0.44			3.69	4.41
62.84	412.0	5405.13	5409.71	5408.16	5409.87	0.001265	3.23	127.64	50.06	0.36			3.23	4.58
62.6	412.0	5405.13	5409.71	5407.96	5409.84	0.000886	2.82	146.18	53.96	0.30			2.82	4.58
62.475*	412.0	5405.13	5409.61	5408.34	5409.81	0.001641	3.59	114.78	46.84	0.40			3.59	4.48
62.35	412.0	5405.13	5409.40	5408.47	5409.77	0.003217	4.90	84.13	34.72	0.55			4.90	4.26
62.175*	412.0	5405.10	5409.31	5408.56	5409.71	0.003923	5.03	81.83	38.36	0.61			5.03	4.21
62	412.0	5405.08	5409.20	5408.65	5409.63	0.004741	5.24	78.57	39.96	0.66			5.24	4.12
61.75*	412.0	5405.03	5408.83	5408.56	5409.46	0.007559	6.37	64.72	35.03	0.83			6.37	3.80
61.5	412.0	5404.98	5408.67	5408.28	5409.28	0.006447	6.30	65.37	31.56	0.77			6.30	3.69
61.25*	412.0	5404.82	5408.57	5408.11	5409.10	0.005655	5.79	71.14	35.80	0.72			5.79	3.75
61	412.0	5404.66	5408.60	5407.82	5408.93	0.003375	4.60	89.58	43.45	0.56			4.60	3.94
60.75*	412.0	5404.53	5408.56	5407.56	5408.84	0.002539	4.23	97.29	43.11	0.50			4.23	4.03
60.5	412.0	5404.39	5408.50	5407.33	5408.77	0.002204	4.13	99.80	41.04	0.47			4.13	4.11
60.25*	412.0	5404.26	5408.35	5407.41	5408.70	0.003050	4.75	86.82	36.94	0.55			4.75	4.09
60	412.0	5404.13	5408.11	5407.43	5408.61	0.004478	5.63	73.19	31.94	0.66			5.63	3.98
59.75*	412.0	5404.00	5408.04	5407.28	5408.48	0.004043	5.29	77.87	34.60	0.62			5.29	4.04
59.5	412.0	5403.88	5407.91	5407.20	5408.37	0.004515	5.45	75.59	34.57	0.65			5.45	4.03
59.25*	412.0	5403.84	5407.79	5407.18	5408.26	0.004690	5.47	75.32	35.76	0.66			5.47	3.95
59	412.0	5403.80	5407.69	5407.09	5408.13	0.004593	5.32	77.40	37.58	0.65			5.32	3.89
58.82*	412.0	5403.67	5407.63	5406.86	5408.04	0.003936	5.11	80.58	37.10	0.61			5.11	3.96
58.64*	412.0	5403.54	5407.57	5406.77	5407.96	0.003537	4.98	82.65	44.89	0.58			4.98	4.03
58.46	412.0	5403.41	5407.51	5406.57	5407.89	0.003368	4.94	83.37	46.47	0.57			4.94	4.10
58.23*	412.0	5403.30	5407.42	5406.54	5407.80	0.003421	4.95	83.31	52.66	0.57			4.95	4.12
58	412.0	5403.19	5407.32	5406.44	5407.72	0.003646	5.05	81.66	54.68	0.59			5.05	4.13
57.8825*	412.0	5403.17	5407.29	5406.39	5407.67	0.003345	4.94	83.44	70.92	0.57			4.94	4.12
57.765*	412.0	5403.16	5407.26	5406.34	5407.63	0.003139	4.88	84.36	101.04	0.55			4.88	4.10
57.6475*	412.0	5403.14	5407.22	5406.26	5407.59	0.003049	4.89	84.33	100.42	0.55			4.89	4.08

Profile Output Table - No Name Arroyo Undisturbed Channel 10yr-6hr
 HEC-RAS Plan: Premine River: No Name Reach: Reach 1 Profile: PF 2

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Vel Lt (ft/s)	Vel Rt (ft/s)	Vel Total (ft/s)	Max Chnl Depth (ft)
57.53	412.0	5403.12	5407.18	5406.22	5407.56	0.003076	4.94	83.33	98.46	0.55			4.94	4.06
57.38	412.0	5403.07	5407.33	5406.15	5407.46	0.001021	3.45	172.23	85.09	0.34	1.60	1.28	2.39	4.26
57.23	412.0	5403.06	5407.23	5405.77	5407.44	0.001420	3.71	116.29	46.42	0.39	0.08	1.18	3.54	4.17
57	412.0	5403.03	5406.97	5406.02	5407.37	0.003509	5.11	80.64	33.88	0.58			5.11	3.94
56.75*	412.0	5402.90	5406.83	5406.05	5407.28	0.003897	5.33	77.25	32.97	0.61			5.33	3.93
56.5	412.0	5402.77	5406.69	5405.92	5407.18	0.004034	5.57	74.10	65.37	0.63	0.17	0.39	5.56	3.92
56.375*	412.0	5402.67	5406.62	5405.89	5407.11	0.004071	5.67	73.88	82.11	0.63	0.51	0.75	5.58	3.95
56.25*	412.0	5402.58	5406.59	5405.87	5407.05	0.003700	5.54	89.32	114.66	0.61	0.66	1.00	4.61	4.01
56.125*	412.0	5402.48	5406.57	5405.86	5406.98	0.003233	5.31	105.44	132.84	0.57	0.86	1.10	3.91	4.09
56	412.0	5402.38	5406.56	5405.89	5406.90	0.002724	5.01	125.65	154.59	0.53	0.95	1.15	3.28	4.18
55.875*	412.0	5402.38	5406.56	5405.92	5406.84	0.002262	4.65	145.72	164.08	0.48	1.02	1.07	2.83	4.18
55.75*	412.0	5402.38	5406.57	5405.69	5406.79	0.001845	4.27	166.50	167.83	0.44	1.07	0.98	2.47	4.19
55.625*	412.0	5402.38	5406.58	5405.62	5406.75	0.001530	3.95	187.53	175.25	0.40	1.08	0.91	2.20	4.19
55.5	412.0	5402.38	5405.75	5405.60	5406.65	0.008341	7.59	55.30	105.01	0.88	0.61	1.23	7.45	3.37
55.375*	412.0	5402.38	5405.77	5405.43	5406.48	0.006468	6.73	62.32	126.95	0.78	0.61	1.11	6.61	3.39
55.25*	412.0	5402.38	5405.78	5405.28	5406.35	0.005288	6.09	68.79	144.84	0.71	0.58	1.03	5.99	3.40
55.125*	412.0	5402.38	5405.76	5405.23	5406.25	0.004565	5.62	74.40	158.62	0.66	0.55	0.94	5.54	3.38
55	412.0	5402.38	5405.75	5405.14	5406.17	0.003997	5.22	79.94	173.90	0.62	0.51	0.88	5.15	3.37
54.875*	412.0	5402.38	5405.91	5405.13	5406.06	0.001690	3.56	192.38	198.47	0.41	1.04	0.59	2.14	3.53
54.75*	412.0	5402.38	5405.20	5405.10	5405.96	0.010004	7.00	58.83	128.03	0.94			7.00	2.82
54.625*	412.0	5402.37	5405.44	5405.13	5405.74	0.004173	4.88	131.90	169.48	0.62	1.31		3.12	3.07
54.5	412.0	5402.37	5405.21	5405.21	5405.64	0.006521	5.71	108.54	152.86	0.76	1.48		3.80	2.84
54.25*	412.0	5402.29	5405.09	5405.03	5405.46	0.005564	5.49	118.53	150.96	0.71	1.57		3.48	2.80
54	412.0	5402.20	5404.87	5404.87	5405.27	0.006472	5.87	114.66	151.66	0.76	1.76	0.43	3.59	2.67
53.8233*	412.0	5402.10	5404.51	5404.71	5405.13	0.012301	7.08	90.74	148.83	1.02	1.95	0.39	4.54	2.41
53.6466*	412.0	5402.01	5404.58	5404.53	5404.86	0.005725	5.03	138.43	188.39	0.71	1.71	1.12	2.98	2.57
53.47	412.0	5401.91	5404.54	5404.34	5404.71	0.003901	4.10	172.02	213.43	0.58	1.57	1.30	2.40	2.63
Max							10.07						Avg	5.50
Min							2.56							
Avg							5.50							

The undisturbed channel reaches following outside of the reconstructed channel reaches were not included in determining the maximum, minimum, and average velocities. The reconstructed reaches are from Station 81.50 to 72.23 and from Station 71.00 to 67.00.

Profile Output Table - No Name Arroyo Undisturbed Channel 25yr-6hr
 HEC-RAS Plan: Premine River: No Name Reach: Reach 1 Profile: PF 3

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Vel Lt (ft/s)	Vel Rt (ft/s)	Vel Total (ft/s)	Max Chnl Depth (ft)
92	655.0	5430.37	5437.09	5432.34	5437.13	0.000116	1.52	458.76	165.47	0.12	0.16	0.20	1.43	6.72
91.8925*	655.0	5430.22	5437.07	5432.64	5437.13	0.000184	1.86	355.17	134.42	0.15	0.21		1.84	6.85
91.785*	655.0	5430.07	5437.04	5433.01	5437.12	0.000300	2.32	286.16	75.08	0.19	0.27		2.29	6.97
91.6775*	655.0	5429.92	5436.97	5433.44	5437.11	0.000540	3.00	221.71	59.87	0.25	0.36		2.95	7.05
91.57	655.0	5429.77	5436.82	5433.99	5437.09	0.001173	4.15	159.88	46.14	0.36	0.46		4.10	7.05
91.465*	655.0	5429.59	5436.71	5434.36	5437.07	0.001617	4.77	141.32	44.69	0.42	0.73		4.63	7.12
91.36*	655.0	5429.42	5436.56	5434.73	5437.03	0.002303	5.56	123.39	49.49	0.49	1.05		5.31	7.14
91.255*	655.0	5429.25	5436.32	5435.06	5436.99	0.003489	6.64	105.01	48.75	0.60	1.41		6.24	7.07
91.15	655.0	5429.07	5435.34	5435.34	5436.86	0.009933	9.90	67.99	34.52	0.96	1.59		9.63	6.27
91.0533*	655.0	5428.81	5433.64	5434.60	5436.59	0.028922	13.78	47.55	20.52	1.60			13.78	4.83
90.9566*	655.0	5428.55	5432.99	5434.02	5436.22	0.037182	14.43	45.40	22.58	1.79			14.43	4.44
90.86	655.0	5428.29	5432.53	5433.61	5435.80	0.042832	14.51	45.13	26.42	1.90			14.51	4.24
90.6	655.0	5427.43	5431.67	5432.71	5434.84	0.031841	14.29	45.83	37.27	1.68			14.29	4.24
90.45*	655.0	5426.88	5430.62	5431.79	5434.27	0.041795	15.33	42.73	33.76	1.91			15.33	3.74
90.3	655.0	5426.33	5429.58	5430.81	5433.54	0.048513	15.97	41.02	21.86	2.05			15.97	3.24
90.2*	655.0	5426.29	5428.84	5430.02	5432.94	0.067914	16.26	40.29	27.77	2.38			16.26	2.54
90.1*	655.0	5426.25	5428.31	5429.36	5432.09	0.078002	15.60	41.98	34.56	2.49			15.60	2.06
90	655.0	5426.21	5427.88	5428.80	5431.15	0.078772	14.51	45.13	41.87	2.46			14.51	1.66
89.875*	655.0	5425.98	5427.97	5428.66	5430.19	0.040553	11.97	54.74	41.23	1.83			11.97	1.99
89.75*	655.0	5425.75	5428.10	5428.53	5429.67	0.022581	10.06	65.08	40.90	1.41			10.06	2.35
89.625*	655.0	5425.52	5428.21	5428.43	5429.43	0.014640	8.85	73.98	40.53	1.15			8.85	2.69
89.5	655.0	5425.29	5428.09	5428.33	5429.35	0.014702	9.02	72.64	38.60	1.16			9.02	2.80
89.4166*	655.0	5425.08	5428.41	5428.14	5429.18	0.007368	7.05	92.90	42.47	0.84			7.05	3.33
89.3333*	655.0	5424.87	5428.46	5427.91	5429.08	0.005133	6.29	104.14	42.94	0.71			6.29	3.59
89.25	655.0	5424.66	5428.50	5427.68	5429.01	0.003781	5.77	113.44	41.96	0.62			5.77	3.83
89.125*	655.0	5424.40	5428.63	5427.40	5428.90	0.002012	4.22	155.19	58.24	0.46			4.22	4.23
89	655.0	5424.13	5428.66	5427.11	5428.86	0.001540	3.54	185.27	74.47	0.39			3.54	4.53
88.8266*	655.0	5423.95	5428.65	5427.31	5428.83	0.001540	3.36	194.83	84.91	0.39			3.36	4.70
88.6533*	655.0	5423.77	5428.63	5427.43	5428.79	0.001693	3.27	200.34	97.89	0.40			3.27	4.86
88.48	655.0	5423.59	5428.60	5427.34	5428.76	0.001905	3.25	201.30	108.03	0.42			3.25	5.01
88.2400*	655.0	5423.60	5428.51	5427.21	5428.72	0.001646	3.70	176.81	69.73	0.41			3.70	4.91
88	655.0	5423.60	5428.16	5427.17	5428.64	0.003160	5.59	117.21	39.50	0.57			5.59	4.55
87.875*	655.0	5423.66	5428.06	5427.21	5428.61	0.003719	5.91	110.83	38.99	0.62			5.91	4.40
87.75*	655.0	5423.72	5427.96	5427.27	5428.57	0.004424	6.27	104.42	38.41	0.67			6.27	4.24
87.625*	655.0	5423.78	5427.82	5427.25	5428.52	0.005361	6.70	97.74	37.67	0.73			6.70	4.04
87.5	655.0	5423.84	5427.32	5427.32	5428.40	0.010212	8.36	78.33	35.23	0.99			8.36	3.47
87.3333*	655.0	5423.84	5426.89	5427.09	5428.21	0.014020	9.22	71.02	35.17	1.14			9.22	3.05
87.1666*	655.0	5423.84	5427.03	5426.89	5427.99	0.008815	7.86	83.34	36.90	0.92			7.86	3.19
87	655.0	5423.84	5426.92	5426.69	5427.81	0.008110	7.61	86.09	37.43	0.88			7.61	3.07
86.74	655.0	5423.82	5426.76	5426.59	5427.57	0.008103	7.23	90.64	42.73	0.87			7.23	2.94
86.62*	655.0	5423.73	5426.88	5426.55	5427.39	0.006102	5.74	114.17	62.05	0.75			5.74	3.15
86.5	655.0	5423.64	5426.77	5426.62	5427.31	0.009407	5.91	110.88	79.94	0.88			5.91	3.13
86.3849*	655.0	5423.55	5426.83	5426.18	5427.19	0.003737	4.80	136.37	66.80	0.59			4.80	3.28
86.27	655.0	5423.47	5426.71	5425.91	5427.15	0.003497	5.38	121.84	58.77	0.59			5.38	3.23
86.1349*	655.0	5423.31	5426.55	5425.91	5427.09	0.004545	5.92	110.70	45.21	0.67			5.92	3.24
86	655.0	5423.15	5426.20	5425.97	5426.98	0.007677	7.09	92.35	42.65	0.85			7.09	3.05
85.8*	655.0	5422.90	5426.17	5425.73	5426.81	0.005695	6.40	102.29	44.25	0.74			6.40	3.27
85.6	655.0	5422.64	5426.15	5425.52	5426.67	0.004349	5.81	112.77	46.09	0.65			5.81	3.51
85.35*	655.0	5422.58	5426.02	5425.43	5426.56	0.004530	5.91	110.81	45.62	0.67			5.91	3.44
85.1*	655.0	5422.52	5425.89	5425.32	5426.45	0.004755	6.04	108.44	44.79	0.68			6.04	3.36
84.85	655.0	5422.46	5425.75	5425.22	5426.33	0.004976	6.16	106.38	44.12	0.70			6.16	3.28
84.6833*	655.0	5422.36	5425.69	5425.19	5426.22	0.005005	5.84	112.18	51.20	0.70			5.84	3.33
84.5166*	655.0	5422.27	5425.59	5425.23	5426.12	0.006319	5.88	111.32	60.31	0.76			5.88	3.32
84.35	655.0	5422.17	5425.47	5425.17	5426.02	0.006989	5.95	110.12	62.66	0.79			5.95	3.30
84.2333*	655.0	5422.17	5425.62	5424.85	5425.88	0.002834	4.10	159.57	81.33	0.52			4.10	3.45
84.1166*	655.0	5422.17	5425.64	5424.70	5425.83	0.002028	3.45	189.87	97.90	0.44			3.45	3.47
84	655.0	5422.17	5425.62	5424.52	5425.80	0.001603	3.38	193.98	108.86	0.40			3.38	3.45
83.75	655.0	5422.39	5425.58	5424.63	5425.76	0.001862	3.46	189.22	185.44	0.42			3.46	3.18
83.625*	655.0	5422.08	5425.64	5423.93	5425.71	0.000546	2.12	308.25	123.45	0.24			2.12	3.56
83.5	655.0	5421.77	5425.67	5423.32	5425.70	0.000179	1.36	482.60	163.66	0.14			1.36	3.90
83.3849*	655.0	5421.42	5425.62	5423.49	5425.69	0.000435	2.13	307.58	102.94	0.22			2.13	4.20
83.27	655.0	5421.08	5425.25	5424.14	5425.65	0.002596	5.07	129.27	43.98	0.52			5.07	4.17
83	655.0	5420.96	5425.19	5424.09	5425.57	0.002587	4.95	132.21	46.29	0.52			4.95	4.23
82.8825*	655.0	5420.96	5425.27	5423.78	5425.49	0.001404	3.75	174.52	59.43	0.39			3.75	4.31
82.765*	655.0	5420.96	5425.31	5423.63	5425.46	0.000960	3.11	210.81	72.07	0.32			3.11	4.35
82.6475*	655.0	5420.97	5425.32	5423.47	5425.44	0.000746	2.71	241.93	84.35	0.28			2.71	4.35
82.53	655.0	5420.97	5425.33	5423.34	5425.42	0.000628	2.44	268.35	96.24	0.26			2.44	4.36
82.3999*	655.0	5420.95	5425.27	5423.33	5425.41	0.000795	2.94	222.47	71.38	0.29			2.94	4.32
82.27	655.0	5420.93	5425.08	5423.60	5425.38	0.001804	4.42	148.35	46.37	0.44			4.42	4.14
82.1349*	655.0	5421.01	5424.93	5423.83	5425.34	0.002716	5.14	127.40	43.35	0.53			5.14	3.92
82	655.0	5421.09	5424.61	5424.11	5425.27	0.005297	6.51	100.59	39.88	0.72			6.51	3.52

Profile Output Table - No Name Arroyo Undisturbed Channel 25yr-6hr
 HEC-RAS Plan: Premine River: No Name Reach: Reach 1 Profile: PF 3

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Vel Lt (ft/s)	Vel Rt (ft/s)	Vel Total (ft/s)	Max Chnl Depth (ft)
81.875*	655.0	5421.00	5424.51	5424.08	5425.20	0.005807	6.65	98.57	40.92	0.75			6.65	3.51
81.75*	655.0	5420.92	5424.41	5424.05	5425.13	0.006402	6.78	96.55	42.07	0.79			6.78	3.49
81.625*	655.0	5420.83	5424.31	5424.03	5425.05	0.007028	6.94	94.41	42.70	0.82			6.94	3.47
81.5	655.0	5420.74	5424.19	5423.98	5424.98	0.007815	7.13	91.84	43.03	0.86			7.13	3.45
81.25	655.0	5420.44	5424.25	5423.58	5424.74	0.004168	5.63	116.34	126.18	0.64			5.63	3.81
81.125*	655.0	5420.06	5424.41	5423.13	5424.62	0.001579	3.72	176.30	67.11	0.40			3.72	4.35
81	655.0	5419.68	5424.46	5422.73	5424.58	0.000842	2.80	233.98	85.22	0.30			2.80	4.78
80.875*	655.0	5419.60	5424.35	5422.86	5424.56	0.001439	3.67	178.44	64.42	0.39			3.67	4.75
80.75	655.0	5419.53	5423.99	5423.19	5424.50	0.003813	5.73	114.29	43.34	0.62			5.73	4.46
80.5	655.0	5419.47	5423.71	5423.15	5424.37	0.005299	6.53	100.30	39.95	0.73			6.53	4.24
80.25*	655.0	5419.47	5423.61	5422.99	5424.23	0.004880	6.36	102.93	40.03	0.70			6.36	4.14
80	655.0	5419.47	5423.52	5422.81	5424.11	0.004295	6.16	106.36	39.24	0.66			6.16	4.05
79.775*	655.0	5419.29	5423.54	5422.50	5423.98	0.002956	5.33	122.86	42.58	0.55			5.33	4.25
79.55	655.0	5419.11	5423.56	5422.21	5423.90	0.002060	4.63	141.56	50.50	0.47			4.63	4.45
79.465*	655.0	5419.12	5423.51	5422.26	5423.88	0.002337	4.86	134.78	47.32	0.50			4.86	4.39
79.38*	655.0	5419.13	5423.45	5422.34	5423.86	0.002702	5.13	127.63	43.94	0.53			5.13	4.32
79.295*	655.0	5419.14	5423.37	5422.41	5423.83	0.003170	5.44	120.43	42.92	0.57			5.44	4.23
79.21*	655.0	5419.15	5423.28	5422.48	5423.80	0.003828	5.81	112.66	41.89	0.62			5.81	4.13
79.125*	655.0	5419.16	5423.15	5422.54	5423.77	0.004929	6.35	103.23	40.74	0.70			6.35	3.99
79.04	655.0	5419.17	5422.62	5422.62	5423.68	0.010696	8.29	79.00	38.40	1.01			8.29	3.45
78.77	655.0	5419.02	5421.95	5422.23	5423.31	0.016736	9.35	70.07	39.10	1.23			9.35	2.93
78.5	655.0	5418.74	5422.41	5421.78	5422.91	0.004573	5.69	115.07	61.00	0.67			5.69	3.67
78.375*	655.0	5418.54	5422.31	5421.70	5422.83	0.004616	5.80	113.00	49.22	0.67			5.80	3.77
78.25*	655.0	5418.35	5422.20	5421.61	5422.76	0.004864	6.00	109.16	46.79	0.69			6.00	3.85
78.125*	655.0	5418.15	5422.03	5421.58	5422.67	0.005609	6.40	102.29	44.01	0.74			6.40	3.88
78	655.0	5417.95	5421.54	5421.54	5422.54	0.010642	8.05	81.41	40.03	0.99			8.05	3.59
77.7966*	655.0	5417.52	5420.75	5421.09	5422.22	0.018585	9.74	67.26	38.21	1.29			9.74	3.23
77.5933*	655.0	5417.08	5421.31	5420.85	5422.00	0.005869	6.65	98.54	41.35	0.76			6.65	4.23
77.39	655.0	5416.65	5420.64	5420.64	5421.79	0.010347	8.59	76.22	32.69	0.99			8.59	3.99
77.2666*	655.0	5416.28	5419.86	5420.25	5421.52	0.017608	10.36	63.22	30.78	1.27			10.36	3.58
77.1433*	655.0	5415.91	5419.34	5419.91	5421.29	0.022341	11.22	58.35	30.28	1.42			11.22	3.43
77.02*	655.0	5415.54	5418.95	5419.55	5420.99	0.024167	11.46	57.16	30.59	1.48			11.46	3.41
76.8966*	655.0	5415.18	5420.14	5419.22	5420.71	0.003699	6.06	108.11	36.16	0.62			6.06	4.96
76.7733*	655.0	5414.81	5420.16	5418.91	5420.64	0.002763	5.58	117.41	35.26	0.54			5.58	5.35
76.65	655.0	5414.44	5420.16	5418.63	5420.60	0.002291	5.31	123.27	33.89	0.49			5.31	5.72
76.4666*	655.0	5414.50	5420.16	5418.53	5420.54	0.001952	4.90	133.68	37.53	0.46			4.90	5.66
76.2833*	655.0	5414.55	5420.17	5418.43	5420.48	0.001672	4.53	144.61	41.14	0.43			4.53	5.61
76.1	655.0	5414.61	5420.16	5418.38	5420.44	0.001454	4.21	155.56	50.85	0.40			4.21	5.55
75.984*	655.0	5414.62	5420.10	5418.47	5420.42	0.001772	4.53	144.56	45.18	0.44			4.53	5.48
75.868*	655.0	5414.64	5420.02	5418.60	5420.39	0.002221	4.92	133.09	41.84	0.49			4.92	5.38
75.752*	655.0	5414.65	5419.91	5418.73	5420.36	0.002920	5.43	120.60	40.17	0.55			5.43	5.25
75.6359*	655.0	5414.67	5419.74	5418.89	5420.32	0.004030	6.13	106.89	37.67	0.64			6.13	5.07
75.52	655.0	5414.68	5419.05	5419.05	5420.20	0.010340	8.63	75.88	32.31	0.99			8.63	4.37
75.3466*	655.0	5414.46	5418.38	5418.76	5419.93	0.018878	10.01	65.41	35.50	1.30			10.01	3.92
75.1733*	655.0	5414.24	5418.00	5418.44	5419.53	0.024622	9.94	65.92	44.51	1.44			9.94	3.76
75	655.0	5414.02	5418.61	5418.01	5419.05	0.004189	5.27	124.23	57.24	0.63			5.27	4.59
74.8*	655.0	5413.78	5418.60	5417.77	5418.95	0.003181	4.75	137.78	60.52	0.56			4.75	4.82
74.6*	655.0	5413.54	5418.59	5417.55	5418.87	0.002396	4.28	153.19	63.92	0.49			4.28	5.05
74.4	655.0	5413.30	5418.59	5417.26	5418.82	0.001806	3.85	170.21	67.36	0.43			3.85	5.29
74.2*	655.0	5413.27	5418.54	5417.20	5418.78	0.001790	3.89	168.22	65.54	0.43			3.89	5.27
74	655.0	5413.25	5418.47	5417.21	5418.74	0.002192	4.21	155.46	130.66	0.47			4.21	5.22
73.9166*	655.0	5413.20	5418.40	5417.24	5418.72	0.002440	4.54	144.31	104.14	0.49			4.54	5.20
73.8333*	655.0	5413.16	5418.30	5417.32	5418.70	0.002958	5.06	129.32	92.58	0.54			5.06	5.14
73.75	655.0	5413.11	5418.08	5417.35	5418.65	0.004329	6.04	108.45	82.27	0.65			6.04	4.97
73.5	655.0	5412.90	5417.65	5417.25	5418.49	0.006657	7.33	89.32	59.53	0.79			7.33	4.75
73.375*	655.0	5412.83	5417.80	5417.03	5418.33	0.004116	5.89	111.29	45.45	0.63			5.89	4.96
73.25	655.0	5412.76	5417.88	5416.83	5418.24	0.002676	4.82	135.92	49.64	0.51			4.82	5.12
73	655.0	5412.42	5417.61	5416.76	5418.14	0.003845	5.81	112.78	41.00	0.62			5.81	5.19
72.77	655.0	5412.16	5417.60	5416.62	5418.02	0.003121	5.24	125.09	46.14	0.55			5.24	5.44
72.615*	655.0	5412.04	5417.45	5416.45	5417.97	0.003469	5.79	113.11	37.41	0.59			5.79	5.41
72.46	655.0	5411.92	5417.22	5416.30	5417.92	0.004253	6.67	98.13	37.02	0.65			6.67	5.30
72.23	655.0	5411.71	5417.34	5416.46	5417.74	0.003249	5.05	129.65	50.78	0.56			5.05	5.63
72.1150*	655.0	5411.76	5417.12	5416.52	5417.68	0.004799	5.98	109.46	45.41	0.68			5.98	5.36
72	655.0	5411.82	5416.37	5416.37	5417.54	0.010654	8.69	75.37	32.11	1.00			8.69	4.55
71.78	655.0	5411.71	5415.86	5416.20	5417.22	0.021761	9.38	69.82	46.59	1.35			9.38	4.15
71.6866*	655.0	5411.68	5415.75	5416.02	5416.94	0.019011	8.77	74.65	49.94	1.26			8.77	4.07
71.5933*	655.0	5411.66	5416.00	5415.83	5416.69	0.008542	6.66	98.40	54.41	0.87			6.66	4.34
71.5	655.0	5411.63	5416.01	5415.70	5416.57	0.006512	6.00	109.13	56.88	0.76			6.00	4.38
71.375*	655.0	5411.50	5415.85	5415.62	5416.49	0.007433	6.39	102.44	54.01	0.82			6.39	4.35
71.25*	655.0	5411.37	5415.73	5415.48	5416.39	0.007304	6.48	101.02	51.48	0.82			6.48	4.36
71.125*	655.0	5411.23	5415.67	5415.28	5416.27	0.005993	6.22	105.34	48.42	0.74			6.22	4.44

Profile Output Table - No Name Arroyo Undisturbed Channel 25yr-6hr
 HEC-RAS Plan: Premine River: No Name Reach: Reach 1 Profile: PF 3

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Vel Lt (ft/s)	Vel Rt (ft/s)	Vel Total (ft/s)	Max Chnl Depth (ft)
71	655.0	5411.10	5415.65	5414.99	5416.17	0.004450	5.77	113.57	45.39	0.64			5.77	4.55
70.875*	655.0	5411.04	5415.53	5415.14	5416.11	0.005913	6.09	107.54	51.61	0.74			6.09	4.49
70.75	655.0	5410.97	5415.10	5415.10	5415.99	0.011304	7.57	86.55	48.66	1.00			7.57	4.13
70.65*	655.0	5410.80	5414.53	5414.87	5415.81	0.021541	9.10	71.97	50.27	1.34			9.10	3.73
70.55*	655.0	5410.62	5414.10	5414.52	5415.58	0.029228	9.76	67.08	53.24	1.53			9.76	3.48
70.45*	655.0	5410.45	5413.67	5414.17	5415.27	0.031539	10.14	64.61	50.88	1.59			10.14	3.22
70.35	655.0	5410.28	5414.76	5413.73	5415.05	0.002480	4.32	151.53	62.31	0.49			4.32	4.48
70.175*	655.0	5410.25	5414.64	5413.84	5415.00	0.003126	4.78	137.02	58.60	0.55			4.78	4.39
70	655.0	5410.21	5414.61	5413.60	5414.94	0.002665	4.61	142.19	56.11	0.51			4.61	4.40
69.75*	655.0	5409.81	5414.57	5413.27	5414.87	0.002119	4.43	147.75	53.01	0.47			4.43	4.76
69.5	655.0	5409.42	5414.45	5413.23	5414.81	0.002895	4.79	136.79	54.48	0.53			4.79	5.03
69.3333*	655.0	5409.23	5414.37	5413.35	5414.74	0.002910	4.94	132.52	50.60	0.54			4.94	5.13
69.1666*	655.0	5409.05	5414.26	5413.29	5414.68	0.003140	5.23	125.14	46.12	0.56			5.23	5.21
69	655.0	5408.86	5414.08	5413.23	5414.61	0.003882	5.80	112.91	41.64	0.62			5.80	5.22
68.75*	655.0	5408.79	5414.06	5413.16	5414.48	0.003351	5.18	126.57	58.19	0.57			5.18	5.27
68.5	655.0	5408.71	5413.95	5413.00	5414.40	0.003353	5.39	121.58	56.86	0.58			5.39	5.24
68.375*	655.0	5408.70	5413.94	5413.01	5414.34	0.003299	5.13	127.66	63.56	0.57			5.13	5.23
68.25	655.0	5408.69	5413.93	5412.71	5414.29	0.002403	4.80	136.42	62.24	0.50			4.80	5.24
68.13	655.0	5408.63	5414.04	5412.08	5414.22	0.001037	3.41	192.02	58.55	0.33			3.41	5.41
67.99	655.0	5408.63	5414.00	5412.21	5414.20	0.001364	3.60	181.86	63.54	0.38			3.60	5.37
67.89*	655.0	5408.63	5413.85	5412.37	5414.17	0.001974	4.56	143.50	46.04	0.46			4.56	5.22
67.79	655.0	5408.63	5413.35	5412.61	5414.10	0.004799	6.94	94.35	29.95	0.69			6.94	4.72
67.65	655.0	5408.40	5412.87	5412.63	5413.97	0.008092	8.43	77.68	27.47	0.88			8.43	4.47
67.4	655.0	5408.12	5413.01	5412.36	5413.67	0.004987	6.52	100.52	37.01	0.70			6.52	4.89
67.2*	655.0	5407.92	5413.00	5412.20	5413.55	0.003969	5.96	109.94	39.88	0.63			5.96	5.08
67	655.0	5407.73	5412.97	5412.03	5413.46	0.003468	5.62	116.61	41.94	0.59			5.62	5.24
66.75*	655.0	5407.68	5412.87	5411.91	5413.37	0.003450	5.68	115.32	40.80	0.60			5.68	5.19
66.5	655.0	5407.63	5412.75	5411.83	5413.29	0.003690	5.86	111.73	39.60	0.62			5.86	5.12
66.255*	655.0	5407.58	5412.53	5411.84	5413.19	0.004671	6.50	100.71	36.16	0.69			6.50	4.95
66.01	655.0	5407.52	5412.13	5411.76	5413.02	0.007034	7.56	86.66	32.30	0.81			7.56	4.61
65.84*	655.0	5407.39	5411.89	5411.70	5412.91	0.008401	8.12	80.65	31.84	0.90			8.12	4.49
65.67*	655.0	5407.25	5411.52	5411.52	5412.71	0.010221	8.76	74.76	30.87	0.99			8.76	4.27
65.5	655.0	5407.12	5410.92	5411.21	5412.48	0.015217	10.03	65.28	29.76	1.19			10.03	3.80
65.25*	655.0	5406.85	5411.38	5411.00	5412.18	0.006412	7.14	91.68	36.35	0.79			7.14	4.53
65	655.0	5406.58	5411.11	5410.94	5411.98	0.008848	7.51	87.22	40.85	0.91			7.51	4.53
64.8*	655.0	5406.58	5410.96	5410.74	5411.80	0.008042	7.37	88.88	40.29	0.87			7.37	4.38
64.6*	655.0	5406.58	5410.81	5410.53	5411.65	0.007478	7.34	89.21	38.55	0.85			7.34	4.23
64.4	655.0	5406.58	5410.67	5410.38	5411.52	0.007533	7.41	88.43	37.79	0.85			7.41	4.08
64.175*	655.0	5406.38	5410.82	5410.08	5411.27	0.003935	5.36	122.11	52.47	0.62			5.36	4.44
63.95	655.0	5406.17	5410.91	5409.79	5411.14	0.002028	3.91	167.35	69.81	0.45			3.91	4.74
63.7633*	655.0	5405.99	5410.82	5409.78	5411.09	0.002444	4.23	154.98	66.84	0.49			4.23	4.82
63.5766*	655.0	5405.81	5410.71	5409.76	5411.03	0.002860	4.56	143.55	62.39	0.53			4.56	4.90
63.39	655.0	5405.63	5410.59	5409.72	5410.96	0.003246	4.87	134.39	58.25	0.57			4.87	4.96
63.2066*	655.0	5405.46	5410.58	5409.49	5410.90	0.002508	4.50	145.48	58.45	0.50			4.50	5.12
63.0233*	655.0	5405.30	5410.58	5409.15	5410.84	0.001837	4.11	159.31	57.87	0.44			4.11	5.28
62.84	655.0	5405.13	5410.58	5408.78	5410.80	0.001323	3.78	173.44	55.45	0.38			3.78	5.45
62.6	655.0	5405.13	5410.58	5408.51	5410.76	0.000983	3.34	196.02	60.82	0.33		0.07	3.34	5.45
62.475*	655.0	5405.13	5410.46	5408.93	5410.73	0.001674	4.19	156.22	51.87	0.42		0.18	4.19	5.33
62.35	655.0	5405.13	5410.13	5409.17	5410.67	0.003722	5.88	111.31	38.76	0.61			5.88	5.00
62.175*	655.0	5405.10	5410.07	5409.26	5410.60	0.003912	5.81	112.76	43.17	0.63		0.23	5.81	4.97
62	655.0	5405.08	5410.00	5409.27	5410.52	0.004231	5.83	112.47	46.98	0.65		0.39	5.82	4.91
61.75*	655.0	5405.03	5409.64	5409.25	5410.37	0.006350	6.85	95.61	40.56	0.79			6.85	4.61
61.5	655.0	5404.98	5409.47	5409.05	5410.23	0.006318	7.03	93.19	37.58	0.79			7.03	4.48
61.25*	655.0	5404.82	5409.42	5408.77	5410.03	0.005044	6.28	104.35	42.66	0.71			6.28	4.60
61	655.0	5404.66	5409.48	5408.44	5409.87	0.002803	4.99	133.82	58.32	0.54	0.83		4.89	4.82
60.75*	655.0	5404.53	5409.44	5408.20	5409.79	0.002238	4.75	140.24	59.87	0.49	0.60	0.48	4.67	4.91
60.5	655.0	5404.39	5409.39	5407.98	5409.73	0.002012	4.70	145.71	58.56	0.47	0.40	1.13	4.50	5.00
60.25*	655.0	5404.26	5409.20	5408.10	5409.66	0.003097	5.44	120.53	42.79	0.57	0.16		5.43	4.94
60	655.0	5404.13	5408.85	5408.20	5409.54	0.005096	6.66	98.37	36.72	0.72			6.66	4.72
59.75*	655.0	5404.00	5408.78	5408.01	5409.38	0.004543	6.21	105.45	40.15	0.68			6.21	4.78
59.5	655.0	5403.88	5408.65	5407.96	5409.27	0.005038	6.31	103.88	42.15	0.70		0.39	6.31	4.77
59.25*	655.0	5403.84	5408.52	5407.89	5409.14	0.004942	6.32	103.86	42.77	0.70		0.58	6.31	4.68
59	655.0	5403.80	5408.43	5407.77	5409.01	0.004547	6.13	107.48	45.56	0.67		0.74	6.09	4.63
58.82*	655.0	5403.67	5408.36	5407.60	5408.92	0.004170	6.00	109.56	52.13	0.65		0.62	5.98	4.69
58.64*	655.0	5403.54	5408.27	5407.45	5408.83	0.004081	5.97	109.88	57.59	0.64		0.48	5.96	4.73
58.46	655.0	5403.41	5408.17	5407.35	5408.74	0.004237	6.03	108.73	69.12	0.65		0.33	6.02	4.76
58.23*	655.0	5403.30	5408.07	5407.25	5408.64	0.004321	6.05	108.32	70.60	0.66	0.05	0.25	6.05	4.77
58	655.0	5403.19	5407.94	5407.20	5408.54	0.004490	6.20	107.00	82.75	0.67	0.51	0.07	6.12	4.75
57.8825*	655.0	5403.17	5408.12	5407.13	5408.41	0.002227	4.72	204.77	161.98	0.48	1.26	0.35	3.20	4.95
57.765*	655.0	5403.16	5408.16	5407.06	5408.35	0.001565	4.10	247.21	162.18	0.41	1.34	0.35	2.65	4.99
57.6475*	655.0	5403.14	5408.18	5406.95	5408.32	0.001167	3.62	287.50	167.63	0.35	1.34	0.33	2.28	5.03

Profile Output Table - No Name Arroyo Undisturbed Channel 25yr-6hr
 HEC-RAS Plan: Premine River: No Name Reach: Reach 1 Profile: PF 3

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Vel Lt (ft/s)	Vel Rt (ft/s)	Vel Total (ft/s)	Max Chnl Depth (ft)
57.53	655.0	5403.12	5408.19	5406.96	5408.29	0.000890	3.22	326.73	169.86	0.31	1.32	0.31	2.00	5.07
57.38	655.0	5403.07	5408.06	5406.54	5408.27	0.001300	4.45	265.24	161.76	0.39	1.30	1.80	2.47	4.99
57.23	655.0	5403.06	5407.90	5406.43	5408.23	0.001717	4.69	153.76	159.11	0.44	0.51	1.61	4.26	4.84
57	655.0	5403.03	5407.79	5406.82	5408.19	0.002907	5.29	170.34	154.54	0.55	1.15	0.40	3.85	4.76
56.75*	655.0	5402.90	5407.69	5406.77	5408.10	0.002752	5.40	174.66	159.07	0.54	1.17	0.75	3.75	4.79
56.5	655.0	5402.77	5407.67	5406.69	5408.00	0.002174	5.11	202.01	160.89	0.49	1.30	0.85	3.24	4.90
56.375*	655.0	5402.67	5406.72	5406.69	5407.87	0.008970	8.64	77.98	102.44	0.95	0.96	1.28	8.40	4.05
56.25*	655.0	5402.58	5407.02	5407.02	5407.62	0.004364	6.67	148.81	149.67	0.68	1.43	1.30	4.40	4.44
56.125*	655.0	5402.48	5406.64	5406.89	5407.56	0.007124	8.03	115.82	140.58	0.85	1.41	1.68	5.66	4.16
56	655.0	5402.38	5406.85	5406.80	5407.35	0.003901	6.40	174.21	171.80	0.64	1.54	1.55	3.76	4.47
55.875*	655.0	5402.38	5406.81	5406.70	5407.25	0.003509	6.12	187.82	174.76	0.61	1.59	1.48	3.49	4.43
55.75*	655.0	5402.38	5406.80	5406.60	5407.17	0.002990	5.72	207.30	181.00	0.56	1.60	1.38	3.16	4.42
55.625*	655.0	5402.38	5406.80	5406.49	5407.10	0.002535	5.33	229.27	190.51	0.52	1.58	1.27	2.86	4.42
55.5	655.0	5402.38	5406.81	5406.53	5407.05	0.002130	4.93	253.94	200.74	0.48	1.54	1.20	2.58	4.43
55.375*	655.0	5402.38	5406.82	5406.21	5407.00	0.001617	4.32	283.39	208.93	0.42	1.41	1.03	2.31	4.44
55.25*	655.0	5402.38	5406.82	5406.04	5406.97	0.001260	3.83	312.72	215.31	0.37	1.32	0.90	2.09	4.44
55.125*	655.0	5402.38	5406.83	5405.90	5406.94	0.001005	3.42	342.12	220.56	0.33	1.24	0.81	1.91	4.45
55	655.0	5402.38	5405.77	5405.77	5406.82	0.009894	8.25	80.51	175.38	0.98	0.83	1.40	8.14	3.38
54.875*	655.0	5402.38	5405.76	5405.76	5406.83	0.010093	8.32	79.96	184.44	0.99	1.01	1.14	8.19	3.38
54.75*	655.0	5402.38	5405.78	5405.74	5406.20	0.005226	6.02	179.68	194.18	0.71	1.78	0.63	3.65	3.40
54.625*	655.0	5402.37	5405.72	5405.68	5406.12	0.005238	5.94	183.52	192.30	0.71	1.86	0.28	3.57	3.35
54.5	655.0	5402.37	5405.66	5405.59	5406.04	0.005216	5.86	187.47	190.87	0.70	1.92		3.49	3.29
54.25*	655.0	5402.29	5405.46	5405.40	5405.87	0.005580	6.17	181.98	189.29	0.73	2.02	0.58	3.60	3.17
54	655.0	5402.20	5405.20	5405.20	5405.68	0.006961	6.79	169.44	180.24	0.81	2.28	1.21	3.87	3.00
53.8233*	655.0	5402.10	5404.77	5405.01	5405.52	0.013344	8.23	134.00	173.18	1.09	2.66	1.34	4.89	2.67
53.6466*	655.0	5402.01	5404.85	5404.80	5405.20	0.006525	5.97	191.22	207.56	0.77	2.23	1.57	3.43	2.84
53.47	655.0	5401.91	5404.87	5404.57	5405.06	0.003906	4.66	244.46	235.67	0.60	1.93	1.56	2.68	2.95
Max							11.46	Avg						
Min							2.80							
Avg							6.05							

The undisturbed channel reaches following outside of the reconstructed channel reaches were not included in determining the maximum, minimum, and average velocities. The reconstructed reaches are from Station 81.50 to 72.23 and from Station 71.00 to 67.00.

Profile Output Table - No Name Arroyo Undisturbed Channel 100yr-6hr
 HEC-RAS Plan: Premine River: No Name Reach: Reach 1 Profile: PF 4

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Vel Lt (ft/s)	Vel Rt (ft/s)	Vel Total (ft/s)	Max Chnl Depth (ft)
92.00	1011.0	5430.37	5438.42	5432.89	5438.47	0.000109	1.73	738.65	252.23	0.12	0.34	0.40	1.37	8.05
91.8925*	1011.0	5430.22	5438.40	5433.28	5438.46	0.000168	2.08	626.05	245.25	0.15	0.42	0.44	1.61	8.18
91.785*	1011.0	5430.07	5438.36	5433.75	5438.46	0.000277	2.57	510.47	233.82	0.19	0.54	0.48	1.98	8.29
91.6775*	1011.0	5429.92	5438.28	5434.29	5438.45	0.000515	3.33	389.42	208.93	0.25	0.73	0.52	2.60	8.36
91.57	1011.0	5429.77	5438.08	5435.02	5438.42	0.001213	4.76	233.33	155.51	0.37	1.06		4.33	8.31
91.465*	1011.0	5429.59	5438.03	5435.47	5438.40	0.001418	5.10	269.41	199.61	0.40	1.10	0.75	3.75	8.44
91.36*	1011.0	5429.42	5438.01	5435.90	5438.39	0.001539	5.34	308.97	248.60	0.42	1.00	1.01	3.27	8.59
91.255*	1011.0	5429.25	5438.05	5436.28	5438.35	0.001363	5.11	383.49	284.83	0.39	1.20	1.13	2.64	8.80
91.15	1011.0	5429.07	5436.64	5436.64	5438.21	0.007834	10.33	111.17	86.93	0.89	2.88		9.09	7.56
91.0533*	1011.0	5428.81	5434.58	5435.73	5437.94	0.025814	14.71	68.73	32.68	1.56			14.71	5.77
90.9566*	1011.0	5428.55	5433.73	5435.00	5437.61	0.035796	15.80	63.97	34.38	1.81			15.80	5.18
90.86	1011.0	5428.29	5433.17	5434.48	5437.19	0.043261	16.09	62.83	51.65	1.97			16.09	4.88
90.60	1011.0	5427.43	5432.62	5433.78	5436.14	0.027290	15.07	67.08	46.80	1.61			15.07	5.18
90.45*	1011.0	5426.88	5431.43	5432.77	5435.62	0.036125	16.42	61.59	44.15	1.84			16.42	4.55
90.30	1011.0	5426.33	5430.31	5431.82	5435.01	0.043507	17.40	58.10	42.85	2.01			17.40	3.97
90.2*	1011.0	5426.29	5429.37	5430.84	5434.46	0.061367	18.10	55.87	30.24	2.35			18.10	3.08
90.1*	1011.0	5426.25	5428.70	5430.10	5433.77	0.077244	18.07	55.96	36.58	2.57			18.07	2.45
90.00	1011.0	5426.21	5428.19	5429.45	5432.82	0.083781	17.27	58.55	43.75	2.63			17.27	1.98
89.875*	1011.0	5425.98	5428.29	5429.33	5431.70	0.049590	14.82	68.21	43.25	2.08			14.82	2.31
89.75*	1011.0	5425.75	5428.43	5429.21	5430.97	0.030314	12.81	78.95	43.02	1.67			12.81	2.68
89.625*	1011.0	5425.52	5428.66	5429.17	5430.51	0.018126	10.92	92.62	43.40	1.32			10.92	3.14
89.50	1011.0	5425.29	5429.34	5429.07	5430.34	0.007317	8.05	125.58	46.56	0.86			8.05	4.04
89.4166*	1011.0	5425.08	5429.40	5428.87	5430.24	0.005571	7.34	137.81	47.84	0.76			7.34	4.32
89.3333*	1011.0	5424.87	5429.44	5428.66	5430.16	0.004331	6.82	148.33	47.39	0.68			6.82	4.57
89.25	1011.0	5424.66	5429.46	5428.42	5430.12	0.003546	6.49	155.71	45.66	0.62			6.49	4.80
89.125*	1011.0	5424.40	5429.65	5428.01	5429.99	0.001779	4.64	218.09	64.78	0.44			4.64	5.25
89.00	1011.0	5424.13	5429.71	5427.78	5429.93	0.001291	3.75	269.76	88.26	0.38	0.11		3.75	5.58
88.8266*	1011.0	5423.95	5429.72	5427.88	5429.90	0.001127	3.46	291.82	96.06	0.35			3.46	5.76
88.6533*	1011.0	5423.77	5429.71	5427.98	5429.88	0.001037	3.26	310.29	105.22	0.33			3.26	5.94
88.48	1011.0	5423.59	5429.70	5428.09	5429.85	0.001004	3.12	324.21	114.43	0.33			3.12	6.11
88.2400*	1011.0	5423.60	5429.58	5427.77	5429.82	0.001330	3.96	255.40	77.52	0.38			3.96	5.98
88.00	1011.0	5423.60	5429.06	5427.89	5429.73	0.003334	6.56	154.14	42.09	0.60			6.56	5.46
87.875*	1011.0	5423.66	5428.96	5427.97	5429.70	0.003828	6.87	147.15	41.80	0.65			6.87	5.30
87.75*	1011.0	5423.72	5428.83	5428.04	5429.65	0.004499	7.25	139.43	41.42	0.70			7.25	5.11
87.625*	1011.0	5423.78	5428.70	5428.08	5429.61	0.005286	7.65	132.14	40.97	0.75			7.65	4.92
87.50	1011.0	5423.84	5428.09	5428.09	5429.48	0.009858	9.48	106.69	38.47	1.00			9.48	4.24
87.3333*	1011.0	5423.84	5427.59	5427.85	5429.29	0.013330	10.46	96.67	37.90	1.15			10.46	3.75
87.1666*	1011.0	5423.84	5427.76	5427.69	5429.04	0.008890	9.08	111.31	39.65	0.96			9.08	3.92
87.00	1011.0	5423.84	5427.59	5427.48	5428.85	0.008770	9.00	112.29	39.95	0.95			9.00	3.75
86.74	1011.0	5423.82	5427.54	5427.26	5428.56	0.007241	8.10	124.79	45.18	0.86			8.10	3.72
86.62*	1011.0	5423.73	5427.82	5427.07	5428.34	0.003965	5.78	174.85	67.67	0.63			5.78	4.09
86.50	1011.0	5423.64	5427.88	5427.11	5428.24	0.003372	4.82	209.71	94.72	0.57			4.82	4.24
86.3849*	1011.0	5423.55	5427.82	5426.68	5428.20	0.002536	4.92	205.32	72.00	0.51			4.92	4.27
86.27	1011.0	5423.47	5427.53	5426.53	5428.14	0.003490	6.25	161.74	69.12	0.61			6.25	4.06
86.1349*	1011.0	5423.31	5427.36	5426.58	5428.08	0.004404	6.81	148.47	49.66	0.68			6.81	4.05
86.00	1011.0	5423.15	5426.99	5426.64	5427.98	0.006877	7.96	127.03	44.97	0.83			7.96	3.84
85.8*	1011.0	5422.90	5426.99	5426.42	5427.81	0.005217	7.25	139.41	46.35	0.74			7.25	4.09
85.60	1011.0	5422.64	5426.99	5426.16	5427.67	0.004079	6.64	152.30	47.99	0.66			6.64	4.35
85.35*	1011.0	5422.58	5426.87	5426.09	5427.57	0.004191	6.72	150.48	47.70	0.67			6.72	4.29
85.1*	1011.0	5422.52	5426.75	5425.98	5427.47	0.004358	6.83	148.06	47.18	0.68			6.83	4.23
84.85	1011.0	5422.46	5426.62	5425.87	5427.37	0.004475	6.92	146.20	46.56	0.69			6.92	4.16
84.6833*	1011.0	5422.36	5426.64	5425.81	5427.24	0.003838	6.22	162.55	54.93	0.64			6.22	4.28
84.5166*	1011.0	5422.27	5426.64	5425.82	5427.14	0.003558	5.71	177.15	64.81	0.61			5.71	4.37
84.35	1011.0	5422.17	5426.61	5425.74	5427.06	0.003366	5.40	187.21	90.20	0.59			5.40	4.44
84.2333*	1011.0	5422.17	5426.71	5425.34	5426.96	0.001636	4.01	252.11	87.75	0.42			4.01	4.54
84.1166*	1011.0	5422.17	5426.75	5425.17	5426.92	0.001127	3.34	302.30	104.73	0.35			3.34	4.58
84.00	1011.0	5422.17	5426.76	5424.96	5426.90	0.000932	2.97	340.13	121.83	0.31			2.97	4.59
83.75	1011.0	5422.39	5426.69	5425.04	5426.87	0.001108	3.45	292.74	195.39	0.35			3.45	4.30
83.625*	1011.0	5422.08	5426.75	5424.29	5426.83	0.000403	2.25	449.79	171.15	0.21			2.25	4.67
83.50	1011.0	5421.77	5426.78	5423.63	5426.82	0.000151	1.52	667.23	168.50	0.13			1.52	5.01
83.3849*	1011.0	5421.42	5426.72	5423.92	5426.81	0.000382	2.38	423.97	108.13	0.21			2.38	5.30
83.27	1011.0	5421.08	5426.23	5424.83	5426.76	0.002544	5.81	173.98	47.00	0.53			5.81	5.15
83.00	1011.0	5420.96	5426.19	5424.74	5426.68	0.002449	5.62	179.98	49.64	0.52			5.62	5.23
82.8825*	1011.0	5420.96	5426.30	5424.36	5426.58	0.001314	4.25	237.62	63.41	0.39			4.25	5.34
82.765*	1011.0	5420.96	5426.35	5424.13	5426.54	0.000880	3.51	288.39	76.67	0.32			3.51	5.39
82.6475*	1011.0	5420.97	5426.38	5424.01	5426.52	0.000664	3.03	333.49	89.63	0.28			3.03	5.40
82.53	1011.0	5420.97	5426.39	5423.82	5426.50	0.000542	2.71	373.44	102.30	0.25			2.71	5.42
82.3999*	1011.0	5420.95	5426.31	5423.88	5426.49	0.000776	3.39	298.66	75.96	0.30			3.39	5.36
82.27	1011.0	5420.93	5426.02	5424.25	5426.45	0.001930	5.22	193.62	49.07	0.46			5.22	5.09
82.1349*	1011.0	5421.01	5425.84	5424.55	5426.40	0.002828	6.03	167.64	45.83	0.56			6.03	4.83
82.00	1011.0	5421.09	5425.44	5424.82	5426.32	0.005199	7.51	134.62	42.01	0.74			7.51	4.35

Profile Output Table - No Name Arroyo Undisturbed Channel 100yr-6hr
 HEC-RAS Plan: Premine River: No Name Reach: Reach 1 Profile: PF 4

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Vel Lt (ft/s)	Vel Rt (ft/s)	Vel Total (ft/s)	Max Chnl Depth (ft)
81.875*	1011.0	5421.00	5425.36	5424.80	5426.24	0.005388	7.52	134.47	43.41	0.75			7.52	4.36
81.75*	1011.0	5420.92	5425.29	5424.75	5426.17	0.005508	7.52	134.44	44.29	0.76			7.52	4.37
81.625*	1011.0	5420.83	5425.21	5424.71	5426.09	0.005657	7.54	134.14	44.93	0.77			7.54	4.38
81.50	1011.0	5420.74	5425.13	5424.66	5426.02	0.005869	7.58	133.42	45.41	0.78			7.58	4.39
81.25	1011.0	5420.44	5425.23	5424.20	5425.81	0.003346	6.10	165.78	133.06	0.60			6.10	4.79
81.125*	1011.0	5420.06	5425.43	5423.63	5425.69	0.001336	4.10	246.61	91.56	0.39			4.10	5.37
81.00	1011.0	5419.68	5425.49	5423.24	5425.64	0.000729	3.12	324.34	89.81	0.29			3.12	5.81
80.875*	1011.0	5419.60	5425.36	5423.44	5425.62	0.001301	4.11	245.85	69.07	0.38			4.11	5.76
80.75	1011.0	5419.53	5424.90	5423.92	5425.56	0.003689	6.52	155.13	47.02	0.63			6.52	5.37
80.50	1011.0	5419.47	5424.60	5423.93	5425.43	0.005193	7.31	138.32	45.73	0.74			7.31	5.13
80.25*	1011.0	5419.47	5424.49	5423.76	5425.30	0.004777	7.22	140.11	44.19	0.71			7.22	5.02
80.00	1011.0	5419.47	5424.39	5423.56	5425.18	0.004388	7.12	142.04	42.56	0.69			7.12	4.92
79.775*	1011.0	5419.29	5424.44	5423.22	5425.04	0.003097	6.22	162.59	47.30	0.58			6.22	5.15
79.55	1011.0	5419.11	5424.49	5422.91	5424.94	0.002153	5.38	194.39	68.96	0.49	1.07		5.20	5.38
79.465*	1011.0	5419.12	5424.41	5422.98	5424.92	0.002510	5.71	176.99	57.17	0.53			5.71	5.29
79.38*	1011.0	5419.13	5424.33	5423.06	5424.89	0.002873	6.01	168.27	53.17	0.56			6.01	5.20
79.295*	1011.0	5419.14	5424.25	5423.13	5424.87	0.003324	6.33	159.67	49.64	0.60			6.33	5.11
79.21*	1011.0	5419.15	5424.14	5423.23	5424.84	0.003934	6.71	150.59	59.16	0.65			6.71	4.99
79.125*	1011.0	5419.16	5424.00	5423.29	5424.81	0.004884	7.22	140.02	70.95	0.72			7.22	4.84
79.04	1011.0	5419.17	5423.39	5423.39	5424.71	0.010006	9.24	109.40	60.03	1.01			9.24	4.21
78.77	1011.0	5419.02	5422.59	5422.98	5424.30	0.015679	10.50	96.32	64.46	1.23			10.50	3.57
78.50	1011.0	5418.74	5423.31	5422.45	5423.89	0.003958	6.13	164.95	108.92	0.65			6.13	4.57
78.375*	1011.0	5418.54	5423.19	5422.38	5423.82	0.004104	6.34	159.35	55.33	0.66			6.34	4.65
78.25*	1011.0	5418.35	5423.04	5422.33	5423.74	0.004509	6.70	150.95	51.61	0.69			6.70	4.69
78.125*	1011.0	5418.15	5422.86	5422.26	5423.66	0.005255	7.21	140.21	47.79	0.74			7.21	4.71
78.00	1011.0	5417.95	5422.24	5422.24	5423.54	0.010058	9.15	110.46	42.58	1.00			9.15	4.29
77.7966*	1011.0	5417.52	5422.35	5421.82	5423.23	0.005644	7.52	134.41	45.45	0.77			7.52	4.83
77.5933*	1011.0	5417.08	5422.33	5421.61	5423.10	0.004890	7.04	143.69	48.06	0.72			7.04	5.25
77.39	1011.0	5416.65	5421.56	5421.56	5422.89	0.009756	9.26	109.15	39.92	0.99			9.26	4.91
77.2666*	1011.0	5416.28	5420.59	5421.16	5422.67	0.017475	11.57	87.39	35.68	1.30			11.57	4.31
77.1433*	1011.0	5415.91	5420.05	5420.73	5422.43	0.021219	12.37	81.75	35.10	1.43			12.37	4.14
77.02*	1011.0	5415.54	5419.65	5420.38	5422.14	0.022307	12.65	79.90	34.47	1.46			12.65	4.11
76.8966*	1011.0	5415.18	5421.14	5420.02	5421.89	0.003681	6.91	146.22	39.58	0.63			6.91	5.96
76.7733*	1011.0	5414.81	5421.16	5419.75	5421.83	0.002991	6.57	153.99	37.99	0.57			6.57	6.35
76.65	1011.0	5414.44	5421.15	5419.45	5421.79	0.002664	6.41	157.77	36.15	0.54			6.41	6.71
76.4666*	1011.0	5414.50	5421.17	5419.34	5421.70	0.002193	5.85	172.84	40.08	0.50			5.85	6.67
76.2833*	1011.0	5414.55	5421.19	5419.21	5421.64	0.001839	5.37	188.14	48.91	0.46			5.37	6.64
76.10	1011.0	5414.61	5421.20	5419.10	5421.58	0.001574	4.97	203.37	58.78	0.43			4.97	6.59
75.984*	1011.0	5414.62	5421.12	5419.27	5421.56	0.001883	5.30	190.68	54.95	0.46			5.30	6.50
75.868*	1011.0	5414.64	5421.03	5419.41	5421.53	0.002312	5.70	177.37	48.11	0.51			5.70	6.39
75.752*	1011.0	5414.65	5420.90	5419.55	5421.50	0.002951	6.21	162.84	44.40	0.57			6.21	6.25
75.6359*	1011.0	5414.67	5420.69	5419.74	5421.45	0.004099	6.96	145.17	42.58	0.66			6.96	6.02
75.52	1011.0	5414.68	5419.91	5419.91	5421.33	0.009859	9.55	105.82	37.20	1.00			9.55	5.23
75.3466*	1011.0	5414.46	5418.95	5419.54	5421.03	0.020626	11.57	87.38	40.75	1.39			11.57	4.49
75.1733*	1011.0	5414.24	5418.41	5419.09	5420.61	0.027222	11.91	84.90	46.99	1.56			11.91	4.17
75.00	1011.0	5414.02	5419.74	5418.59	5420.17	0.002693	5.25	192.42	88.91	0.53			5.25	5.72
74.8*	1011.0	5413.78	5419.75	5418.35	5420.10	0.002112	4.79	211.10	73.88	0.48			4.79	5.97
74.6*	1011.0	5413.54	5419.75	5418.12	5420.05	0.001664	4.37	231.45	70.87	0.43			4.37	6.21
74.40	1011.0	5413.30	5419.76	5417.87	5420.00	0.001317	3.99	253.31	85.50	0.38			3.99	6.46
74.2*	1011.0	5413.27	5419.72	5417.88	5419.98	0.001333	4.07	248.29	136.30	0.39			4.07	6.45
74.00	1011.0	5413.25	5419.66	5417.94	5419.95	0.001582	4.34	233.05	147.54	0.42			4.34	6.41
73.9166*	1011.0	5413.20	5419.58	5417.95	5419.93	0.001820	4.77	212.16	136.76	0.45			4.77	6.38
73.8333*	1011.0	5413.16	5419.45	5418.00	5419.90	0.002315	5.42	186.55	105.93	0.50			5.42	6.29
73.75	1011.0	5413.11	5419.20	5418.12	5419.86	0.003481	6.53	154.85	89.85	0.61			6.53	6.09
73.50	1011.0	5412.90	5418.73	5418.05	5419.71	0.005575	7.97	126.92	76.96	0.75			7.97	5.83
73.375*	1011.0	5412.83	5418.93	5417.76	5419.55	0.003281	6.31	160.33	81.53	0.59			6.31	6.10
73.25	1011.0	5412.76	5419.04	5417.45	5419.46	0.002050	5.17	196.23	54.91	0.47		0.67	5.15	6.28
73.00	1011.0	5412.42	5418.77	5417.52	5419.37	0.002978	6.24	163.80	48.92	0.57		0.93	6.17	6.35
72.77	1011.0	5412.16	5418.78	5417.31	5419.27	0.002441	5.63	179.49	53.63	0.51			5.63	6.62
72.615*	1011.0	5412.04	5418.58	5417.24	5419.23	0.003101	6.46	156.54	39.67	0.57			6.46	6.54
72.46	1011.0	5411.92	5418.13	5417.26	5419.13	0.004879	8.02	126.05	45.40	0.71			8.02	6.21
72.23	1011.0	5411.71	5418.43	5417.06	5418.88	0.002513	5.42	186.42	53.52	0.51			5.42	6.72
72.1150*	1011.0	5411.76	5418.23	5417.21	5418.83	0.003514	6.25	161.87	49.47	0.61			6.25	6.47
72.00	1011.0	5411.82	5417.18	5417.18	5418.69	0.010206	9.85	102.59	34.70	1.01			9.85	5.36
71.78	1011.0	5411.71	5416.20	5416.83	5418.33	0.027560	11.72	86.29	49.24	1.56			11.72	4.49
71.6866*	1011.0	5411.68	5416.05	5416.62	5418.01	0.025745	11.25	89.85	51.92	1.51			11.25	4.36
71.5933*	1011.0	5411.66	5415.84	5416.43	5417.81	0.027169	11.26	89.78	53.82	1.54			11.26	4.18
71.50	1011.0	5411.63	5416.73	5416.25	5417.43	0.005554	6.68	151.24	59.11	0.74			6.68	5.10
71.375*	1011.0	5411.50	5416.58	5416.20	5417.36	0.006291	7.10	142.44	56.26	0.79			7.10	5.08
71.25*	1011.0	5411.37	5416.45	5416.08	5417.27	0.006468	7.31	138.34	53.17	0.80			7.31	5.08
71.125*	1011.0	5411.23	5416.34	5415.90	5417.17	0.006092	7.31	138.21	49.82	0.77			7.31	5.11

Profile Output Table - No Name Arroyo Undisturbed Channel 100yr-6hr
 HEC-RAS Plan: Premine River: No Name Reach: Reach 1 Profile: PF 4

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Vel Lt (ft/s)	Vel Rt (ft/s)	Vel Total (ft/s)	Max Chnl Depth (ft)
71.00	1011.0	5411.10	5416.30	5415.63	5417.07	0.005131	7.06	143.27	46.50	0.71			7.06	5.20
70.875*	1011.0	5411.04	5416.23	5415.74	5416.99	0.005662	7.00	144.44	54.01	0.75			7.00	5.19
70.75	1011.0	5410.97	5415.75	5415.75	5416.85	0.010198	8.41	120.22	53.39	0.99			8.41	4.78
70.65*	1011.0	5410.80	5415.00	5415.47	5416.70	0.020959	10.46	96.64	53.61	1.37			10.46	4.20
70.55*	1011.0	5410.62	5414.55	5415.08	5416.45	0.026413	11.08	91.22	55.24	1.52			11.08	3.93
70.45*	1011.0	5410.45	5415.80	5414.72	5416.24	0.002960	5.30	190.87	66.75	0.55			5.30	5.35
70.35	1011.0	5410.28	5415.87	5414.30	5416.18	0.001852	4.46	226.55	71.43	0.44			4.46	5.59
70.175*	1011.0	5410.25	5415.77	5414.36	5416.14	0.002187	4.88	207.34	65.58	0.48			4.88	5.52
70.00	1011.0	5410.21	5415.73	5414.22	5416.10	0.001973	4.90	206.35	58.52	0.46			4.90	5.52
69.75*	1011.0	5409.81	5415.69	5413.95	5416.05	0.001779	4.80	210.79	58.59	0.45			4.80	5.88
69.50	1011.0	5409.42	5415.61	5414.08	5416.00	0.002083	4.98	203.02	59.06	0.47			4.98	6.19
69.3333*	1011.0	5409.23	5415.54	5414.04	5415.96	0.002153	5.21	193.96	53.92	0.48			5.21	6.31
69.1666*	1011.0	5409.05	5415.42	5414.01	5415.91	0.002424	5.60	180.38	53.99	0.51			5.60	6.37
69.00	1011.0	5408.86	5415.24	5414.01	5415.85	0.003090	6.25	161.66	52.46	0.57			6.25	6.38
68.75*	1011.0	5408.79	5415.29	5413.86	5415.72	0.002339	5.29	191.22	71.11	0.50			5.29	6.50
68.50	1011.0	5408.71	5415.24	5413.75	5415.65	0.002537	5.12	197.27	82.83	0.52			5.12	6.53
68.375*	1011.0	5408.70	5415.22	5413.72	5415.62	0.002264	5.06	199.63	81.68	0.50	0.04		5.06	6.52
68.25	1011.0	5408.69	5415.26	5413.44	5415.56	0.001457	4.59	247.15	75.10	0.41	1.84		4.09	6.57
68.13	1011.0	5408.63	5415.30	5412.68	5415.52	0.000915	3.73	270.84	67.33	0.32			3.73	6.67
67.99	1011.0	5408.63	5415.28	5413.01	5415.50	0.001013	3.81	265.62	67.62	0.34			3.81	6.65
67.89*	1011.0	5408.63	5415.09	5413.12	5415.47	0.001677	4.96	203.78	50.53	0.44			4.96	6.46
67.79	1011.0	5408.63	5414.40	5413.44	5415.38	0.004799	7.96	127.01	32.31	0.71			7.96	5.77
67.65	1011.0	5408.40	5413.69	5413.57	5415.24	0.008920	9.99	101.23	29.48	0.95			9.99	5.29
67.40	1011.0	5408.12	5414.04	5413.18	5414.85	0.004482	7.19	140.52	40.69	0.68			7.19	5.92
67.2*	1011.0	5407.92	5414.06	5412.95	5414.73	0.003515	6.56	154.23	43.87	0.62			6.56	6.14
67.00	1011.0	5407.73	5414.05	5412.81	5414.64	0.003042	6.16	164.22	46.34	0.58			6.16	6.32
66.75*	1011.0	5407.68	5413.96	5412.73	5414.56	0.003094	6.23	162.38	45.88	0.58			6.23	6.28
66.50	1011.0	5407.63	5413.85	5412.65	5414.48	0.003347	6.38	158.58	45.92	0.60			6.38	6.22
66.255*	1011.0	5407.58	5413.57	5412.67	5414.37	0.004313	7.19	140.58	40.59	0.68			7.19	5.99
66.01	1011.0	5407.52	5413.02	5412.63	5414.19	0.007056	8.69	116.40	34.82	0.84			8.69	5.50
65.84*	1011.0	5407.39	5412.78	5412.56	5414.08	0.007998	9.15	110.48	34.63	0.90			9.15	5.39
65.67*	1011.0	5407.25	5412.37	5412.37	5413.88	0.009813	9.87	102.42	33.81	1.00			9.87	5.12
65.50	1011.0	5407.12	5411.72	5412.08	5413.67	0.014134	11.21	90.18	32.48	1.19			11.21	4.60
65.25*	1011.0	5406.85	5411.45	5411.79	5413.24	0.014179	10.76	93.94	36.49	1.18			10.76	4.60
65.00	1011.0	5406.58	5411.91	5411.69	5412.99	0.007793	8.34	121.17	43.62	0.88			8.34	5.33
64.8*	1011.0	5406.58	5411.79	5411.47	5412.82	0.007164	8.16	123.96	43.94	0.86			8.16	5.21
64.6*	1011.0	5406.58	5411.65	5411.31	5412.68	0.007105	8.16	123.91	43.84	0.86			8.16	5.06
64.40	1011.0	5406.58	5411.50	5411.22	5412.56	0.007266	8.26	122.39	43.12	0.86			8.26	4.92
64.175*	1011.0	5406.38	5411.77	5410.76	5412.28	0.003368	5.76	175.40	60.18	0.60			5.76	5.39
63.95	1011.0	5406.17	5411.90	5410.30	5412.16	0.001512	4.13	266.05	123.71	0.40		0.85	3.80	5.73
63.7633*	1011.0	5405.99	5411.80	5410.38	5412.11	0.001890	4.48	232.15	109.19	0.45		0.49	4.35	5.81
63.5766*	1011.0	5405.81	5411.71	5410.38	5412.06	0.002304	4.79	210.96	72.83	0.49		0.04	4.79	5.90
63.39	1011.0	5405.63	5411.60	5410.36	5412.01	0.002658	5.12	197.48	68.36	0.53			5.12	5.97
63.2066*	1011.0	5405.46	5411.59	5410.09	5411.95	0.002156	4.84	208.89	67.14	0.48			4.84	6.13
63.0233*	1011.0	5405.30	5411.58	5409.85	5411.90	0.001692	4.59	220.53	66.25	0.43		0.31	4.58	6.28
62.84	1011.0	5405.13	5411.57	5409.45	5411.87	0.001356	4.37	233.85	81.68	0.39		0.35	4.32	6.44
62.60	1011.0	5405.13	5411.59	5409.16	5411.81	0.000998	3.85	278.01	107.35	0.34	0.17	0.65	3.64	6.46
62.475*	1011.0	5405.13	5411.43	5409.62	5411.79	0.001594	4.83	223.06	91.53	0.43	0.37	0.84	4.53	6.30
62.35	1011.0	5405.13	5411.04	5410.05	5411.72	0.003474	6.71	165.08	76.24	0.61	0.43	1.40	6.12	5.91
62.175*	1011.0	5405.10	5411.00	5410.01	5411.65	0.003476	6.52	164.88	66.57	0.62			1.30	6.13
62.00	1011.0	5405.08	5410.94	5409.99	5411.57	0.003573	6.40	165.26	64.21	0.62			1.33	6.12
61.75*	1011.0	5405.03	5410.60	5410.02	5411.44	0.005067	7.39	140.58	54.46	0.74			1.30	7.19
61.50	1011.0	5404.98	5410.25	5409.85	5411.28	0.006346	8.15	125.48	46.32	0.82			1.08	8.06
61.25*	1011.0	5404.82	5410.30	5409.60	5411.06	0.004508	7.00	146.49	55.45	0.70	0.38	0.98	6.90	5.48
61.00	1011.0	5404.66	5410.43	5409.17	5410.89	0.002368	5.56	200.61	92.91	0.52	1.13	0.82	5.04	5.77
60.75*	1011.0	5404.53	5410.38	5408.93	5410.83	0.001999	5.40	209.48	94.98	0.48	0.90	1.28	4.83	5.85
60.50	1011.0	5404.39	5410.33	5408.77	5410.77	0.001906	5.43	210.70	93.82	0.47	0.73	1.62	4.80	5.94
60.25*	1011.0	5404.26	5410.08	5408.89	5410.70	0.003004	6.35	167.44	78.96	0.58	0.71	0.83	6.04	5.82
60.00	1011.0	5404.13	5409.54	5409.07	5410.55	0.006066	8.07	125.86	43.62	0.80	0.81		8.03	5.41
59.75*	1011.0	5404.00	5409.49	5408.86	5410.35	0.005278	7.45	136.21	48.42	0.75	0.66	0.15	7.42	5.49
59.50	1011.0	5403.88	5409.35	5408.80	5410.22	0.005659	7.49	136.68	53.41	0.77	0.48	1.25	7.40	5.47
59.25*	1011.0	5403.84	5409.19	5408.69	5410.08	0.005781	7.62	135.09	51.94	0.78		1.35	7.48	5.35
59.00	1011.0	5403.80	5409.07	5408.53	5409.93	0.005340	7.48	139.50	67.92	0.75		1.54	7.25	5.27
58.82*	1011.0	5403.67	5408.96	5408.36	5409.82	0.005286	7.47	138.61	119.28	0.75		1.42	7.29	5.29
58.64*	1011.0	5403.54	5409.08	5408.26	5409.66	0.003549	6.39	214.68	178.94	0.62	1.27	1.26	4.71	5.54
58.46	1011.0	5403.41	5408.37	5408.18	5409.53	0.008255	8.64	117.41	100.63	0.92		0.88	8.61	4.96
58.23*	1011.0	5403.30	5408.61	5408.12	5409.23	0.004195	6.72	215.21	178.89	0.67	1.55	0.97	4.70	5.31
58.00	1011.0	5403.19	5408.59	5408.35	5409.08	0.003387	6.23	246.89	182.29	0.61	1.68	0.91	4.09	5.40
57.8825*	1011.0	5403.17	5408.64	5408.14	5408.99	0.002394	5.45	294.33	183.26	0.51	1.74	0.78	3.43	5.47
57.765*	1011.0	5403.16	5408.67	5407.97	5408.93	0.001784	4.84	337.93	183.71	0.45	1.74	0.73	2.99	5.51
57.6475*	1011.0	5403.14	5408.70	5407.72	5408.89	0.001378	4.35	379.46	184.06	0.39	1.71	0.67	2.66	5.56

Profile Output Table - No Name Arroyo Undisturbed Channel 100yr-6hr
 HEC-RAS Plan: Premine River: No Name Reach: Reach 1 Profile: PF 4

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Vel Lt (ft/s)	Vel Rt (ft/s)	Vel Total (ft/s)	Max Chnl Depth (ft)
57.53	1011.0	5403.12	5408.71	5407.50	5408.86	0.001097	3.93	419.29	184.59	0.35	1.68	0.62	2.41	5.59
57.38	1011.0	5403.07	5408.55	5407.09	5408.83	0.001654	5.42	349.96	181.01	0.45	1.73	2.23	2.89	5.48
57.23	1011.0	5403.06	5408.25	5407.17	5408.76	0.002553	6.09	231.77	169.03	0.54	1.13	2.15	4.36	5.19
57.00	1011.0	5403.03	5408.12	5408.00	5408.70	0.004091	6.73	220.84	159.37	0.66	1.87	0.87	4.58	5.09
56.75*	1011.0	5402.90	5407.95	5407.95	5408.62	0.004434	7.22	217.36	179.48	0.69	1.77	1.13	4.65	5.04
56.50	1011.0	5402.77	5407.70	5407.70	5408.46	0.004935	7.74	207.23	163.30	0.73	2.00	1.28	4.88	4.93
56.375*	1011.0	5402.67	5407.65	5407.65	5408.32	0.004436	7.46	226.95	177.56	0.70	2.00	1.40	4.45	4.98
56.25*	1011.0	5402.58	5407.28	5407.48	5408.24	0.006733	8.75	190.35	171.25	0.85	2.14	1.75	5.31	4.70
56.125*	1011.0	5402.48	5407.05	5407.36	5408.14	0.008035	9.36	180.53	171.52	0.93	2.25	2.07	5.60	4.57
56.00	1011.0	5402.38	5406.88	5407.22	5408.01	0.008764	9.66	179.51	172.87	0.97	2.38	2.36	5.63	4.50
55.875*	1011.0	5402.38	5406.88	5407.08	5407.81	0.007365	8.99	199.89	178.33	0.89	2.41	2.20	5.06	4.50
55.75*	1011.0	5402.38	5406.88	5406.99	5407.64	0.006191	8.37	221.62	185.97	0.82	2.40	2.02	4.56	4.50
55.625*	1011.0	5402.38	5406.88	5406.90	5407.50	0.005268	7.81	244.38	196.23	0.75	2.35	1.87	4.14	4.50
55.50	1011.0	5402.38	5406.55	5406.76	5407.44	0.008112	9.13	204.44	182.49	0.92	2.66	2.09	4.95	4.17
55.375*	1011.0	5402.38	5406.61	5406.65	5407.22	0.005529	7.67	242.16	197.99	0.76	2.37	1.77	4.17	4.23
55.25*	1011.0	5402.38	5406.32	5406.52	5407.11	0.007542	8.40	210.78	193.02	0.88	2.44	2.00	4.80	3.94
55.125*	1011.0	5402.38	5406.32	5406.38	5406.93	0.005928	7.43	235.83	201.40	0.78	2.31	1.79	4.29	3.94
55.00	1011.0	5402.38	5406.33	5406.22	5406.79	0.004636	6.58	263.64	208.85	0.69	2.19	1.62	3.83	3.95
54.875*	1011.0	5402.38	5406.29	5406.16	5406.72	0.004553	6.45	269.78	210.54	0.69	2.23	1.43	3.75	3.91
54.75*	1011.0	5402.38	5406.24	5406.10	5406.65	0.004495	6.34	275.39	213.39	0.68	2.26	1.23	3.67	3.86
54.625*	1011.0	5402.37	5406.14	5405.98	5406.56	0.004974	6.50	269.27	216.16	0.71	2.35	1.01	3.75	3.77
54.50	1011.0	5402.37	5406.08	5405.94	5406.48	0.004956	6.40	274.40	220.43	0.71	2.38	0.82	3.68	3.71
54.25*	1011.0	5402.29	5405.87	5405.77	5406.32	0.005550	6.88	264.89	221.21	0.75	2.47	1.30	3.82	3.58
54.00	1011.0	5402.20	5405.55	5405.55	5406.12	0.007591	7.82	237.85	210.55	0.87	2.82	1.80	4.25	3.35
53.8233*	1011.0	5402.10	5405.08	5405.30	5405.94	0.013808	9.32	191.07	196.72	1.14	3.33	2.12	5.29	2.98
53.6466*	1011.0	5402.01	5405.23	5405.07	5405.61	0.006175	6.57	274.78	234.92	0.78	2.63	2.01	3.68	3.22
53.47	1011.0	5401.91	5405.25	5404.86	5405.48	0.003903	5.27	339.27	263.95	0.62	2.26	1.91	2.98	3.33
Max							12.65	Avg						
Min							3.12							
Avg							6.60							

The undisturbed channel reaches following outside of the reconstructed channel reaches were not included in determining the maximum, minimum, and average velocities. The reconstructed reaches are from Station 81.50 to 72.23 and from Station 71.00 to 67.00.

Appendix 35.B

No Name Arroyo

HEC-RAS Analysis - Reconstructed Channel

Profile Output Table - No Name Arroyo Reconstructed Channel 2yr-6hr
 HEC-RAS Plan: Postmine River: No Name Reach: Reach 1 Profile: PF 1

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Vel Lt (ft/s)	Vel Rt (ft/s)	Vel Total (ft/s)	Max Chnl Depth (ft)
92	75.0	5430.37	5432.56	5431.00	5432.57	0.000098	0.72	104.00	57.42	0.09			0.72	2.19
91.8925*	75.0	5430.22	5432.56	5431.10	5432.57	0.000171	0.92	81.69	47.44	0.12			0.92	2.34
91.785*	75.0	5430.07	5432.54	5431.13	5432.57	0.000299	1.19	63.14	37.61	0.16			1.19	2.47
91.6775*	75.0	5429.92	5432.52	5431.18	5432.56	0.000492	1.55	48.36	27.50	0.21			1.55	2.60
91.57	75.0	5429.77	5432.48	5431.28	5432.55	0.000857	2.07	36.29	19.66	0.27			2.07	2.71
91.465*	75.0	5429.59	5432.43	5431.46	5432.54	0.001480	2.57	29.19	17.13	0.35			2.57	2.84
91.36*	75.0	5429.42	5432.35	5431.59	5432.51	0.002644	3.24	23.12	14.66	0.46			3.24	2.93
91.255*	75.0	5429.25	5432.18	5431.67	5432.46	0.005076	4.23	17.73	12.10	0.62			4.23	2.93
91.15	75.0	5429.07	5431.70	5431.70	5432.35	0.014355	6.44	11.65	8.85	0.99			6.44	2.63
91.0533*	75.0	5428.81	5430.91	5431.28	5432.06	0.032780	8.61	8.71	8.26	1.48			8.61	2.10
90.9566*	75.0	5428.55	5430.51	5430.90	5431.72	0.036796	8.83	8.50	8.62	1.57			8.83	1.96
90.86	75.0	5428.29	5430.17	5430.55	5431.35	0.037275	8.73	8.59	9.07	1.58			8.73	1.88
90.6	75.0	5427.43	5429.22	5429.59	5430.36	0.038414	8.57	8.75	9.82	1.60			8.57	1.79
90.45*	75.0	5426.88	5428.51	5428.92	5429.73	0.045026	8.86	8.47	10.33	1.72			8.86	1.63
90.3	75.0	5426.33	5427.77	5428.17	5428.97	0.055761	8.80	8.52	12.55	1.88			8.80	1.44
90.2*	75.0	5426.29	5427.53	5427.82	5428.37	0.043417	7.32	10.24	16.80	1.65			7.32	1.24
90.1*	75.0	5426.25	5427.31	5427.51	5427.91	0.034585	6.19	12.11	21.76	1.46			6.19	1.06
90	75.0	5426.21	5427.11	5427.22	5427.50	0.032175	5.01	14.96	35.12	1.35			5.01	0.90
89.875*	75.0	5425.98	5426.92	5427.00	5427.28	0.023858	4.80	15.63	31.35	1.20			4.80	0.94
89.75*	75.0	5425.75	5426.72	5426.76	5427.07	0.020043	4.71	15.93	28.83	1.12			4.71	0.97
89.625*	75.0	5425.52	5426.60	5426.55	5426.87	0.012572	4.18	17.95	27.36	0.91			4.18	1.08
89.5	75.0	5425.29	5426.35	5426.35	5426.69	0.015664	4.65	16.12	24.57	1.01			4.65	1.06
89.4166*	75.0	5425.08	5426.14	5426.20	5426.54	0.020812	5.07	14.80	24.62	1.15			5.07	1.06
89.3333*	75.0	5424.87	5425.99	5426.06	5426.37	0.019985	4.93	15.21	25.63	1.13			4.93	1.12
89.25	75.0	5424.66	5426.06	5425.88	5426.23	0.006795	3.31	22.63	30.77	0.68			3.31	1.40
89.125*	75.0	5424.40	5426.04	5425.64	5426.15	0.003231	2.56	29.28	33.54	0.48			2.56	1.64
89	75.0	5424.13	5426.04	5425.38	5426.10	0.001601	1.93	38.93	40.43	0.35			1.93	1.91
88.8266*	75.0	5423.95	5425.98	5425.37	5426.06	0.002397	2.34	32.00	33.42	0.42			2.34	2.03
88.6533*	75.0	5423.77	5425.92	5425.30	5426.02	0.002643	2.53	29.67	29.68	0.45			2.53	2.15
88.48	75.0	5423.59	5425.87	5425.21	5425.97	0.002573	2.59	28.96	27.26	0.44			2.59	2.28
88.2400*	75.0	5423.60	5425.81	5425.20	5425.91	0.002687	2.59	28.91	28.11	0.45			2.59	2.21
88	75.0	5423.60	5425.77	5425.09	5425.85	0.001952	2.32	32.37	29.34	0.39			2.32	2.16
87.875*	75.0	5423.66	5425.72	5425.14	5425.82	0.002546	2.57	29.21	27.73	0.44			2.57	2.06
87.75*	75.0	5423.72	5425.66	5425.19	5425.78	0.003348	2.82	26.56	26.86	0.50			2.82	1.94
87.625*	75.0	5423.78	5425.58	5425.23	5425.73	0.004767	3.16	23.77	26.57	0.59			3.16	1.80
87.5	75.0	5423.84	5425.41	5425.25	5425.65	0.008893	3.93	19.07	24.46	0.78			3.93	1.56
87.3333*	75.0	5423.84	5425.28	5425.13	5425.50	0.008302	3.74	20.07	26.44	0.76			3.74	1.44
87.1666*	75.0	5423.84	5425.20	5424.96	5425.36	0.005846	3.30	22.72	27.72	0.64			3.30	1.36
87	75.0	5423.84	5425.15	5424.76	5425.27	0.003598	2.83	26.53	28.21	0.51			2.83	1.30
86.74	75.0	5423.82	5425.06	5424.65	5425.18	0.003357	2.76	27.18	28.39	0.50			2.76	1.24
86.62*	75.0	5423.73	5425.00	5424.65	5425.13	0.004280	2.96	25.33	28.59	0.55			2.96	1.26
86.5	75.0	5423.64	5424.84	5424.66	5425.06	0.007942	3.72	20.18	25.66	0.74			3.72	1.20
86.3849*	75.0	5423.55	5424.63	5424.59	5424.93	0.014029	4.39	17.08	26.08	0.96			4.39	1.08
86.27	75.0	5423.47	5424.68	5424.36	5424.77	0.003160	2.33	32.22	41.68	0.47			2.33	1.21
86.1349*	75.0	5423.31	5424.61	5424.36	5424.72	0.004394	2.64	28.44	39.17	0.55			2.64	1.30
86	75.0	5423.15	5424.45	5424.37	5424.63	0.009780	3.41	21.99	37.56	0.79			3.41	1.29
85.8*	75.0	5422.90	5424.30	5424.12	5424.45	0.007281	3.10	24.18	38.28	0.69			3.10	1.40
85.6	75.0	5422.64	5424.21	5423.86	5424.32	0.004058	2.60	28.87	38.46	0.53			2.60	1.57
85.35*	75.0	5422.58	5424.13	5423.76	5424.22	0.003505	2.49	30.08	38.17	0.49			2.49	1.55
85.1*	75.0	5422.52	5424.05	5423.65	5424.14	0.003018	2.38	31.45	38.11	0.46			2.38	1.53
84.85	75.0	5422.46	5423.99	5423.56	5424.07	0.002563	2.26	33.13	38.39	0.43			2.26	1.53
84.6833*	75.0	5422.36	5423.89	5423.60	5424.01	0.004687	2.72	27.57	38.18	0.56			2.72	1.53
84.5166*	75.0	5422.27	5423.75	5423.50	5423.91	0.005976	3.28	22.90	28.72	0.65			3.28	1.48
84.35	75.0	5422.17	5423.71	5423.31	5423.82	0.003346	2.60	28.86	32.97	0.49			2.60	1.54
84.2333*	75.0	5422.17	5423.68	5423.31	5423.78	0.003206	2.45	30.57	40.32	0.48			2.45	1.51
84.1166*	75.0	5422.17	5423.66	5423.25	5423.73	0.002859	2.12	35.30	49.03	0.44			2.12	1.49
84	75.0	5422.17	5423.65	5423.14	5423.70	0.001797	1.76	42.59	55.38	0.35			1.76	1.48
83.75	75.0	5422.39	5423.34	5423.34	5423.60	0.016768	4.05	18.50	36.78	1.01			4.05	0.95
83.625*	75.0	5422.08	5422.80	5422.94	5423.20	0.044890	5.06	14.84	44.34	1.54			5.06	0.72
83.5	75.0	5421.77	5422.97	5422.48	5422.99	0.000691	1.00	74.92	110.84	0.21			1.00	1.20
83.3849*	75.0	5421.42	5422.95	5422.30	5422.98	0.000779	1.23	61.16	73.07	0.24			1.23	1.53
83.27	75.0	5421.08	5422.89	5422.20	5422.96	0.001635	2.13	35.28	32.00	0.36			2.13	1.81
83	75.0	5420.96	5422.83	5422.26	5422.91	0.002184	2.26	33.18	34.13	0.40			2.26	1.87
82.8825*	75.0	5420.96	5422.83	5422.15	5422.88	0.001465	1.82	41.31	43.91	0.33			1.82	1.87
82.765*	75.0	5420.96	5422.82	5422.06	5422.86	0.001035	1.55	48.47	50.50	0.28			1.55	1.86
82.6475*	75.0	5420.97	5422.82	5422.00	5422.85	0.000781	1.35	55.45	57.25	0.24			1.35	1.85
82.53	75.0	5420.97	5422.81	5421.96	5422.84	0.000559	1.20	62.73	60.64	0.21			1.20	1.84
82.3999*	75.0	5420.95	5422.81	5421.92	5422.83	0.000560	1.21	61.73	58.32	0.21			1.21	1.85
82.27	75.0	5420.93	5422.78	5421.85	5422.82	0.000738	1.52	49.37	40.33	0.24			1.52	1.85
82.1349*	75.0	5421.01	5422.75	5422.07	5422.80	0.001459	1.92	38.96	37.49	0.33			1.92	1.74
82	75.0	5421.09	5422.66	5422.29	5422.77	0.003892	2.71	27.63	33.32	0.53			2.71	1.56

Profile Output Table - No Name Arroyo Reconstructed Channel 2yr-6hr
 HEC-RAS Plan: Postmine River: No Name Reach: Reach 1 Profile: PF 1

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Vel Lt (ft/s)	Vel Rt (ft/s)	Vel Total (ft/s)	Max Chnl Depth (ft)
81.875*	75.0	5421.00	5422.57	5422.27	5422.71	0.005035	3.02	24.81	30.89	0.59			3.02	1.57
81.75*	75.0	5420.92	5422.48	5422.22	5422.64	0.005833	3.22	23.32	29.47	0.64			3.22	1.56
81.625*	75.0	5420.83	5422.39	5422.16	5422.56	0.006567	3.36	22.29	28.68	0.67			3.36	1.56
81.5	75.0	5420.75	5422.25	5422.14	5422.47	0.009044	3.73	20.12	28.09	0.78			3.73	1.50
81.25	75.0	5420.52	5421.72	5421.72	5422.17	0.013754	5.38	13.94	15.24	0.99			5.38	1.20
81.125*	75.0	5420.39	5421.51	5421.57	5421.98	0.017682	5.49	13.66	17.63	1.10			5.49	1.12
81	75.0	5420.26	5421.55	5421.43	5421.80	0.009573	3.96	18.94	25.21	0.81			3.96	1.29
80.875*	75.0	5420.13	5421.49	5421.21	5421.69	0.005721	3.57	20.99	22.18	0.65			3.57	1.36
80.75	75.0	5420.01	5421.44	5421.04	5421.62	0.004214	3.38	22.19	20.14	0.57			3.38	1.43
80.5	75.0	5419.78	5421.10	5420.98	5421.45	0.009785	4.78	15.70	15.89	0.85			4.78	1.32
80.25*	75.0	5419.54	5420.86	5420.73	5421.21	0.009724	4.77	15.74	15.90	0.84			4.77	1.32
80	75.0	5419.29	5420.61	5420.49	5420.96	0.009737	4.77	15.73	15.90	0.84			4.77	1.32
79.775*	75.0	5419.07	5420.39	5420.28	5420.75	0.009757	4.77	15.72	15.90	0.85			4.77	1.32
79.55	75.0	5418.85	5420.17	5420.06	5420.52	0.009923	4.80	15.62	15.84	0.85			4.80	1.32
79.465*	75.0	5418.77	5420.08	5419.98	5420.44	0.009994	4.81	15.59	15.86	0.85			4.81	1.31
79.38*	75.0	5418.69	5420.00	5419.88	5420.36	0.009976	4.80	15.63	15.95	0.85			4.80	1.31
79.295*	75.0	5418.60	5419.92	5419.80	5420.27	0.009809	4.77	15.73	16.00	0.85			4.77	1.31
79.21*	75.0	5418.52	5419.84	5419.67	5420.18	0.009636	4.73	15.84	16.06	0.84			4.73	1.32
79.125*	75.0	5418.44	5419.76	5419.64	5420.10	0.009472	4.70	15.97	16.18	0.83			4.70	1.32
79.04	75.0	5418.36	5419.68	5419.55	5420.02	0.009315	4.67	16.08	16.26	0.83			4.67	1.32
78.77	75.0	5418.10	5419.42	5419.29	5419.77	0.009587	4.73	15.85	16.02	0.84			4.73	1.32
78.5	75.0	5417.83	5419.15	5419.03	5419.50	0.009710	4.76	15.75	15.90	0.84			4.76	1.32
78.375*	75.0	5417.71	5419.02	5418.90	5419.38	0.009787	4.78	15.70	15.89	0.85			4.78	1.31
78.25*	75.0	5417.58	5418.90	5418.77	5419.25	0.009697	4.74	15.83	16.11	0.84			4.74	1.32
78.125*	75.0	5417.46	5418.78	5418.65	5419.13	0.009754	4.75	15.81	16.12	0.84			4.75	1.32
78	75.0	5417.34	5418.66	5418.53	5419.01	0.009656	4.75	15.78	15.92	0.84			4.75	1.32
77.7966*	75.0	5417.14	5418.46	5418.33	5418.81	0.009696	4.76	15.75	15.91	0.84			4.76	1.32
77.5933*	75.0	5416.94	5418.26	5418.13	5418.62	0.009808	4.78	15.70	15.92	0.85			4.78	1.32
77.39	75.0	5416.74	5418.07	5417.94	5418.42	0.009702	4.76	15.75	15.91	0.84			4.76	1.33
77.2666*	75.0	5416.62	5417.94	5417.82	5418.30	0.009726	4.77	15.74	15.91	0.84			4.77	1.32
77.1433*	75.0	5416.50	5417.82	5417.70	5418.18	0.009812	4.78	15.70	15.91	0.85			4.78	1.32
77.02*	75.0	5416.38	5417.70	5417.57	5418.05	0.009709	4.76	15.74	15.91	0.84			4.76	1.32
76.8966*	75.0	5416.26	5417.58	5417.45	5417.93	0.009775	4.78	15.70	15.88	0.85			4.78	1.32
76.7733*	75.0	5416.14	5417.46	5417.33	5417.81	0.009808	4.78	15.69	15.88	0.85			4.78	1.32
76.65	75.0	5416.02	5417.34	5417.21	5417.69	0.009778	4.77	15.71	15.89	0.85			4.77	1.32
76.4666*	75.0	5415.84	5417.16	5417.03	5417.51	0.009731	4.77	15.74	15.90	0.84			4.77	1.32
76.2833*	75.0	5415.66	5416.97	5416.85	5417.33	0.009849	4.79	15.66	15.86	0.85			4.79	1.31
76.1	75.0	5415.48	5416.76	5416.69	5417.14	0.010720	4.93	15.20	15.69	0.88			4.93	1.28
75.984*	75.0	5415.36	5416.67	5416.54	5417.01	0.009435	4.68	16.02	16.28	0.83			4.68	1.31
75.868*	75.0	5415.25	5416.60	5416.41	5416.90	0.008138	4.41	17.01	16.94	0.78			4.41	1.35
75.752*	75.0	5415.13	5416.55	5416.28	5416.80	0.006423	4.02	18.64	17.83	0.69			4.02	1.42
75.6359*	75.0	5415.02	5416.49	5416.15	5416.71	0.007718	3.71	20.23	25.28	0.73			3.71	1.47
75.52	75.0	5414.90	5416.44	5416.02	5416.61	0.006488	3.34	22.45	28.86	0.67			3.34	1.53
75.3466*	75.0	5414.74	5416.31	5415.88	5416.48	0.008329	3.28	22.87	36.55	0.73			3.28	1.57
75.1733*	75.0	5414.57	5416.16	5415.74	5416.33	0.008202	3.31	22.62	35.12	0.73			3.31	1.59
75	75.0	5414.41	5415.98	5415.60	5416.18	0.009798	3.57	21.04	33.41	0.79			3.57	1.57
74.8*	75.0	5414.21	5415.78	5415.40	5415.98	0.009960	3.58	20.95	33.48	0.80			3.58	1.57
74.6*	75.0	5414.01	5415.59	5415.20	5415.78	0.009735	3.55	21.14	33.65	0.79			3.55	1.58
74.4	75.0	5413.81	5415.39	5415.02	5415.58	0.009894	3.56	21.05	33.73	0.79			3.56	1.58
74.2*	75.0	5413.62	5415.19	5414.83	5415.39	0.009678	3.54	21.18	33.67	0.79			3.54	1.57
74	75.0	5413.43	5414.99	5414.63	5415.19	0.010182	3.60	20.82	33.53	0.81			3.60	1.56
73.9166*	75.0	5413.34	5414.91	5414.52	5415.10	0.009935	3.57	21.03	33.75	0.80			3.57	1.56
73.8333*	75.0	5413.26	5414.82	5414.46	5415.02	0.009934	3.56	21.07	33.93	0.80			3.56	1.56
73.75	75.0	5413.17	5414.74	5414.36	5414.93	0.009590	3.51	21.36	34.18	0.78			3.51	1.57
73.5	75.0	5412.92	5414.52	5414.13	5414.71	0.008587	3.41	21.99	33.80	0.75			3.41	1.60
73.375*	75.0	5412.80	5414.45	5414.01	5414.61	0.006291	3.22	23.26	30.81	0.65			3.22	1.65
73.25	75.0	5412.68	5414.40	5413.89	5414.53	0.004926	2.87	26.15	34.33	0.58			2.87	1.72
73	75.0	5412.44	5414.34	5413.63	5414.42	0.002498	2.31	32.47	35.41	0.43			2.31	1.90
72.77	75.0	5412.20	5414.31	5413.41	5414.37	0.001279	1.86	40.42	37.01	0.31			1.86	2.11
72.615*	75.0	5412.05	5414.31	5413.18	5414.35	0.000651	1.46	51.28	40.52	0.23			1.46	2.26
72.46	75.0	5411.90	5414.31	5412.95	5414.34	0.000366	1.19	62.95	43.99	0.18			1.19	2.41
72.23	75.0	5411.77	5414.26	5413.15	5414.32	0.000983	2.03	37.02	24.07	0.29			2.03	2.48
72.1150*	75.0	5411.79	5414.19	5413.32	5414.30	0.001851	2.69	27.84	18.81	0.39			2.69	2.40
72	75.0	5411.82	5414.02	5413.49	5414.26	0.004290	3.94	19.04	13.25	0.58			3.94	2.20
71.78	75.0	5411.71	5413.66	5413.52	5414.11	0.009564	5.34	14.04	11.29	0.84			5.34	1.95
71.6866*	75.0	5411.68	5413.50	5413.44	5414.01	0.012099	5.70	13.15	11.60	0.94			5.70	1.82
71.5933*	75.0	5411.66	5413.38	5413.38	5413.89	0.013220	5.72	13.12	12.48	0.98			5.72	1.72
71.5	75.0	5411.63	5413.22	5413.23	5413.76	0.014240	5.88	12.75	12.13	1.01			5.88	1.59
71.375*	75.0	5411.47	5412.84	5412.98	5413.52	0.021635	6.63	11.32	12.58	1.23			6.63	1.37
71.25*	75.0	5411.31	5412.69	5412.76	5413.25	0.018241	6.01	12.48	14.27	1.13			6.01	1.38
71.125*	75.0	5411.15	5412.47	5412.59	5412.96	0.023374	5.59	13.42	20.84	1.23			5.59	1.32

Profile Output Table - No Name Arroyo Reconstructed Channel 2yr-6hr
 HEC-RAS Plan: Postmine River: No Name Reach: Reach 1 Profile: PF 1

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Vel Lt (ft/s)	Vel Rt (ft/s)	Vel Total (ft/s)	Max Chnl Depth (ft)
71	75.0	5410.99	5412.57	5412.22	5412.71	0.003845	2.92	25.67	26.89	0.53			2.92	1.58
70.875*	75.0	5410.89	5412.47	5412.24	5412.64	0.006167	3.35	22.41	27.61	0.65			3.35	1.58
70.75	75.0	5410.79	5412.34	5412.01	5412.55	0.009792	3.61	20.79	32.41	0.79			3.61	1.55
70.6166*	75.0	5410.69	5412.23	5411.89	5412.42	0.009086	3.50	21.40	33.03	0.77			3.50	1.54
70.4833*	75.0	5410.58	5412.13	5411.79	5412.30	0.007946	3.32	22.59	34.23	0.72			3.32	1.55
70.35	75.0	5410.48	5412.12	5411.65	5412.19	0.003044	2.13	35.13	50.05	0.45			2.13	1.64
70.175*	75.0	5410.35	5412.00	5411.53	5412.12	0.005896	2.80	26.78	41.99	0.62			2.80	1.65
70	75.0	5410.22	5411.87	5411.41	5412.00	0.007031	2.95	25.42	41.95	0.67			2.95	1.65
69.75*	75.0	5410.04	5411.67	5411.22	5411.82	0.007385	3.12	24.06	37.91	0.69			3.12	1.63
69.5	75.0	5409.85	5411.47	5411.04	5411.64	0.007567	3.27	22.90	34.04	0.70			3.27	1.62
69.3333*	75.0	5409.72	5411.34	5410.91	5411.51	0.007593	3.28	22.85	33.91	0.70			3.28	1.62
69.1666*	75.0	5409.59	5411.21	5410.78	5411.38	0.007565	3.28	22.85	33.85	0.70			3.28	1.62
69	75.0	5409.46	5411.08	5410.65	5411.25	0.007663	3.30	22.73	33.72	0.71			3.30	1.62
68.75*	75.0	5409.27	5410.89	5410.46	5411.06	0.007688	3.30	22.71	33.74	0.71			3.30	1.62
68.5	75.0	5409.08	5410.70	5410.27	5410.87	0.007723	3.31	22.68	33.72	0.71			3.31	1.62
68.375*	75.0	5408.98	5410.59	5410.19	5410.77	0.008160	3.37	22.28	35.60	0.73			3.37	1.61
68.25	75.0	5408.88	5410.43	5410.09	5410.65	0.010988	3.70	20.29	37.79	0.83			3.70	1.55
68.13	75.0	5408.78	5410.36	5409.93	5410.51	0.007796	3.18	23.58	46.25	0.71			3.18	1.58
67.99	75.0	5408.64	5410.39	5409.45	5410.42	0.000781	1.43	52.33	49.22	0.24			1.43	1.75
67.89*	75.0	5408.58	5410.36	5409.56	5410.41	0.001413	1.74	43.06	47.16	0.32			1.74	1.78
67.79	75.0	5408.51	5410.31	5409.56	5410.38	0.002822	2.12	35.35	48.33	0.44			2.12	1.80
67.65	75.0	5408.41	5410.25	5409.60	5410.34	0.003055	2.42	31.04	36.85	0.46			2.42	1.84
67.4	75.0	5408.21	5410.21	5409.57	5410.27	0.001745	2.11	35.50	33.77	0.36			2.11	1.99
67.2*	75.0	5407.99	5410.17	5409.31	5410.24	0.001321	2.16	34.80	25.91	0.33			2.16	2.18
67	75.0	5407.77	5410.03	5409.48	5410.20	0.003421	3.24	23.18	19.01	0.52			3.24	2.26
66.75*	75.0	5407.70	5409.93	5409.40	5410.11	0.003807	3.36	22.33	18.82	0.54			3.36	2.23
66.5	75.0	5407.63	5409.85	5409.24	5410.01	0.003159	3.22	23.33	18.18	0.50			3.22	2.22
66.255*	75.0	5407.58	5409.74	5409.27	5409.92	0.004052	3.44	21.83	18.64	0.56			3.44	2.16
66.01	75.0	5407.52	5409.40	5409.25	5409.76	0.010641	4.84	15.49	15.85	0.86			4.84	1.88
65.84*	75.0	5407.39	5409.25	5409.08	5409.59	0.008963	4.68	16.03	15.50	0.81			4.68	1.86
65.67*	75.0	5407.25	5409.16	5408.90	5409.44	0.006843	4.22	17.79	16.56	0.72			4.22	1.91
65.5	75.0	5407.12	5409.10	5408.75	5409.32	0.005199	3.72	20.19	18.53	0.63			3.72	1.98
65.25*	75.0	5406.85	5408.97	5408.63	5409.18	0.005517	3.71	20.24	19.44	0.64			3.71	2.12
65	75.0	5406.58	5408.69	5408.52	5409.00	0.008775	4.49	16.72	16.79	0.79			4.49	2.11
64.8*	75.0	5406.58	5408.63	5408.26	5408.83	0.005073	3.61	20.80	19.57	0.62			3.61	2.05
64.6*	75.0	5406.58	5408.58	5408.08	5408.73	0.003161	3.07	24.42	20.54	0.50			3.07	2.00
64.4	75.0	5406.58	5408.55	5407.84	5408.67	0.002115	2.73	27.43	20.13	0.41			2.73	1.97
64.175*	75.0	5406.38	5408.50	5407.97	5408.61	0.002843	2.72	27.61	25.62	0.46			2.72	2.12
63.95	75.0	5406.17	5408.15	5407.95	5408.49	0.008399	4.71	15.92	18.26	0.79			4.71	1.98
63.7633*	75.0	5405.99	5408.01	5407.81	5408.33	0.008240	4.55	16.49	18.99	0.78			4.55	2.02
63.5766*	75.0	5405.81	5407.90	5407.65	5408.16	0.008555	4.10	18.31	21.03	0.77			4.10	2.09
63.39	75.0	5405.63	5407.77	5407.49	5408.01	0.006894	3.95	18.99	19.69	0.71			3.95	2.14
63.2066*	75.0	5405.46	5407.64	5407.37	5407.88	0.007422	3.94	19.03	20.93	0.73			3.94	2.18
63.0233*	75.0	5405.30	5407.60	5407.27	5407.74	0.004319	2.94	25.47	29.00	0.55			2.94	2.30
62.84	75.0	5405.13	5407.60	5406.87	5407.66	0.001283	1.96	38.36	32.31	0.32			1.96	2.47
62.6	75.0	5405.13	5407.59	5406.77	5407.63	0.000940	1.64	45.81	40.23	0.27			1.64	2.46
62.475*	75.0	5405.13	5407.52	5406.93	5407.61	0.002473	2.43	30.90	31.09	0.43			2.43	2.39
62.35	75.0	5405.13	5407.47	5406.86	5407.58	0.002403	2.69	27.88	23.02	0.43			2.69	2.34
62.175*	75.0	5405.10	5407.36	5406.83	5407.52	0.003582	3.20	23.43	20.24	0.52			3.20	2.26
62	75.0	5405.08	5407.29	5406.76	5407.46	0.003524	3.26	23.03	18.99	0.52			3.26	2.21
61.75*	75.0	5405.03	5407.03	5406.84	5407.32	0.008473	4.36	17.21	17.93	0.78			4.36	2.00
61.5	75.0	5404.98	5406.93	5406.56	5407.13	0.004691	3.54	21.16	19.23	0.60			3.54	1.95
61.25*	75.0	5404.82	5406.73	5406.49	5406.98	0.007132	4.02	18.68	19.43	0.72			4.02	1.91
61	75.0	5404.66	5406.61	5406.29	5406.80	0.005596	3.53	21.25	22.43	0.64			3.53	1.95
60.75*	75.0	5404.53	5406.51	5406.14	5406.66	0.004878	3.13	23.94	27.45	0.59			3.13	1.98
60.5	75.0	5404.39	5406.43	5405.92	5406.54	0.003502	2.76	27.15	29.27	0.51			2.76	2.04
60.25*	75.0	5404.26	5406.29	5405.82	5406.45	0.004093	3.15	23.83	23.68	0.55			3.15	2.03
60	75.0	5404.13	5406.18	5405.68	5406.35	0.003744	3.26	22.99	20.09	0.54			3.26	2.05
59.75*	75.0	5404.00	5406.10	5405.57	5406.25	0.003435	3.12	24.01	21.00	0.51			3.12	2.10
59.5	75.0	5403.88	5406.01	5405.48	5406.16	0.003598	3.18	23.60	20.65	0.52			3.18	2.13
59.25*	75.0	5403.84	5405.84	5405.45	5406.05	0.005455	3.69	20.33	19.57	0.64			3.69	2.00
59	75.0	5403.80	5405.65	5405.35	5405.90	0.006357	4.02	18.67	17.53	0.69			4.02	1.85
58.82*	75.0	5403.67	5405.54	5405.24	5405.78	0.006215	3.89	19.26	18.79	0.68			3.89	1.87
58.64*	75.0	5403.54	5405.46	5405.13	5405.67	0.005363	3.61	20.78	20.46	0.63			3.61	1.92
58.46	75.0	5403.41	5405.41	5404.98	5405.57	0.003994	3.23	23.23	26.60	0.55			3.23	2.00
58.23*	75.0	5403.30	5405.32	5404.83	5405.48	0.003546	3.18	23.59	20.58	0.52			3.18	2.02
58	75.0	5403.19	5405.26	5404.67	5405.40	0.003010	3.06	24.49	24.62	0.49			3.06	2.06
57.8825*	75.0	5403.17	5405.21	5404.68	5405.36	0.003285	3.10	24.22	21.69	0.51			3.10	2.04
57.765*	75.0	5403.16	5405.17	5404.68	5405.32	0.003495	3.12	24.07	21.48	0.52			3.12	2.01
57.6475*	75.0	5403.14	5405.13	5404.62	5405.28	0.003751	3.16	23.75	28.59	0.53			3.16	1.98
57.53	75.0	5403.12	5405.07	5404.56	5405.23	0.004027	3.24	23.17	38.73	0.55			3.24	1.95

Profile Output Table - No Name Arroyo Reconstructed Channel 2yr-6hr
 HEC-RAS Plan: Postmine River: No Name Reach: Reach 1 Profile: PF 1

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Vel Lt (ft/s)	Vel Rt (ft/s)	Vel Total (ft/s)	Max Chnl Depth (ft)
57.38	75.0	5403.07	5405.01	5404.60	5405.18	0.004091	3.27	22.99	33.02	0.56		0.28	3.26	1.94
57.23	75.0	5403.06	5405.02	5404.37	5405.11	0.001844	2.30	32.59	28.62	0.38			2.30	1.96
57	75.0	5403.03	5404.92	5404.34	5405.05	0.002688	2.90	25.82	20.98	0.46			2.90	1.89
56.75*	75.0	5402.90	5404.83	5404.28	5404.98	0.003117	3.12	24.05	19.57	0.50			3.12	1.93
56.5	75.0	5402.77	5404.74	5404.22	5404.90	0.003310	3.16	23.76	19.84	0.51			3.16	1.97
56.375*	75.0	5402.67	5404.69	5404.19	5404.85	0.003454	3.20	23.41	19.72	0.52			3.20	2.02
56.25*	75.0	5402.58	5404.64	5404.15	5404.81	0.003652	3.26	23.02	19.72	0.53			3.26	2.06
56.125*	75.0	5402.48	5404.59	5404.10	5404.76	0.003834	3.30	22.73	19.79	0.54			3.30	2.11
56	75.0	5402.38	5404.54	5404.06	5404.71	0.003939	3.31	22.68	20.05	0.55			3.31	2.16
55.875*	75.0	5402.38	5404.50	5404.00	5404.66	0.003746	3.28	22.89	19.74	0.54			3.28	2.12
55.75*	75.0	5402.38	5404.46	5403.94	5404.62	0.003464	3.22	23.32	19.46	0.52			3.22	2.08
55.625*	75.0	5402.38	5404.42	5403.88	5404.57	0.003223	3.16	23.70	19.15	0.50			3.16	2.04
55.5	75.0	5402.38	5404.38	5403.81	5404.53	0.002974	3.10	24.18	18.87	0.48			3.10	2.00
55.375*	75.0	5402.38	5404.36	5403.79	5404.49	0.002730	2.88	26.04	21.49	0.46			2.88	1.98
55.25*	75.0	5402.38	5404.34	5403.73	5404.45	0.002600	2.72	27.59	24.11	0.45			2.72	1.96
55.125*	75.0	5402.38	5404.31	5403.79	5404.42	0.002600	2.61	28.72	26.76	0.44			2.61	1.93
55	75.0	5402.38	5404.28	5403.78	5404.38	0.002657	2.54	29.57	29.36	0.45			2.54	1.90
54.875*	75.0	5402.38	5404.24	5403.79	5404.35	0.002941	2.64	28.41	28.69	0.47			2.64	1.86
54.75*	75.0	5402.38	5404.19	5403.77	5404.31	0.003273	2.75	27.25	28.06	0.49			2.75	1.81
54.625*	75.0	5402.37	5404.13	5403.76	5404.26	0.003707	2.89	25.96	27.29	0.52			2.89	1.76
54.5	75.0	5402.37	5404.07	5403.74	5404.21	0.004386	3.07	24.42	26.58	0.56			3.07	1.69
54.25*	75.0	5402.29	5403.97	5403.57	5404.11	0.003807	2.99	25.08	25.55	0.53			2.99	1.68
54	75.0	5402.20	5403.86	5403.40	5404.01	0.003902	3.08	24.33	23.75	0.54			3.08	1.66
53.8233*	75.0	5402.10	5403.81	5403.38	5403.94	0.003726	2.96	25.36	25.71	0.52			2.96	1.70
53.6466*	75.0	5402.01	5403.75	5403.32	5403.87	0.003718	2.87	26.15	48.20	0.52			2.87	1.74
53.47	75.0	5401.91	5403.68	5403.31	5403.80	0.003902	2.80	26.79	74.72	0.53			2.80	1.77
Max							5.49						Avg	3.74
Min							1.19							
Avg							3.74							

Only the reconstructed channel reaches were included in determining the maximum, minimum, and average velocities. The reconstructed reaches are from Station 81.50 to 72.23 and from Station 71.00 to 67.00.

Profile Output Table - No Name Arroyo Reconstructed Channel 10yr-6hr
 HEC-RAS Plan: Postmine River: No Name Reach: Reach 1 Profile: PF 2

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Vel Lt (ft/s)	Vel Rt (ft/s)	Vel Total (ft/s)	Max Chnl Depth (ft)
92	278.0	5430.37	5434.83	5431.58	5434.85	0.000098	1.12	247.99	69.85	0.10			1.12	4.46
91.8925*	278.0	5430.22	5434.82	5431.80	5434.85	0.000156	1.38	201.91	58.91	0.13			1.38	4.60
91.785*	278.0	5430.07	5434.80	5432.00	5434.85	0.000265	1.74	159.96	48.36	0.17			1.74	4.73
91.6775*	278.0	5429.92	5434.76	5432.20	5434.84	0.000485	2.28	122.02	37.95	0.22			2.28	4.84
91.57	278.0	5429.77	5434.67	5432.47	5434.82	0.001018	3.18	87.48	27.70	0.32			3.18	4.90
91.465*	278.0	5429.59	5434.58	5432.79	5434.80	0.001564	3.77	73.72	24.85	0.39			3.77	4.99
91.36*	278.0	5429.42	5434.46	5433.06	5434.77	0.002486	4.54	61.28	22.03	0.48			4.54	5.03
91.255*	278.0	5429.25	5434.24	5433.32	5434.72	0.004259	5.60	49.61	19.21	0.61			5.60	4.99
91.15	278.0	5429.07	5433.52	5433.52	5434.60	0.011964	8.34	33.34	14.98	0.99			8.34	4.45
91.0533*	278.0	5428.81	5432.34	5432.99	5434.31	0.029708	11.27	24.66	14.60	1.53			11.27	3.53
90.9566*	278.0	5428.55	5431.82	5432.56	5433.98	0.033279	11.80	23.57	14.35	1.62			11.80	3.27
90.86	278.0	5428.29	5431.39	5432.23	5433.64	0.036223	12.04	23.10	14.69	1.69			12.04	3.09
90.6	278.0	5427.43	5430.37	5431.13	5432.66	0.037535	12.17	22.85	14.75	1.72			12.17	2.93
90.45*	278.0	5426.88	5429.53	5430.33	5432.02	0.047229	12.66	21.95	16.20	1.92			12.66	2.65
90.3	278.0	5426.33	5428.58	5429.40	5431.21	0.057723	13.02	21.35	17.82	2.10			13.02	2.25
90.2*	278.0	5426.29	5428.13	5428.86	5430.51	0.066393	12.39	22.44	22.96	2.21			12.39	1.84
90.1*	278.0	5426.25	5427.80	5428.37	5429.71	0.066356	11.08	25.09	30.70	2.16			11.08	1.55
90	278.0	5426.21	5427.47	5427.92	5428.95	0.060881	9.78	28.43	39.41	2.03			9.78	1.25
89.875*	278.0	5425.98	5427.68	5427.76	5428.32	0.015176	6.44	43.20	39.57	1.09			6.44	1.70
89.75*	278.0	5425.75	5427.68	5427.57	5428.19	0.009789	5.70	48.75	38.49	0.89			5.70	1.93
89.625*	278.0	5425.52	5427.57	5427.43	5428.07	0.009023	5.66	49.10	36.78	0.86			5.66	2.05
89.5	278.0	5425.29	5427.28	5427.28	5427.93	0.012450	6.45	43.10	33.63	1.00			6.45	1.99
89.4166*	278.0	5425.08	5426.93	5427.09	5427.78	0.019045	7.41	37.49	32.78	1.22			7.41	1.85
89.3333*	278.0	5424.87	5427.24	5426.94	5427.64	0.006309	5.05	55.02	37.20	0.73			5.05	2.37
89.25	278.0	5424.66	5427.28	5426.69	5427.56	0.003635	4.27	65.18	37.36	0.57			4.27	2.62
89.125*	278.0	5424.40	5427.32	5426.50	5427.49	0.002264	3.30	84.23	50.21	0.45			3.30	2.92
89	278.0	5424.13	5427.33	5426.22	5427.45	0.001432	2.86	97.06	53.71	0.37			2.86	3.19
88.8266*	278.0	5423.95	5427.28	5426.35	5427.42	0.002140	3.01	92.32	60.77	0.43			3.01	3.33
88.6533*	278.0	5423.77	5427.20	5426.35	5427.37	0.003159	3.38	82.28	61.03	0.51			3.38	3.43
88.48	278.0	5423.59	5427.13	5426.34	5427.32	0.002973	3.47	80.12	54.43	0.50			3.47	3.54
88.2400*	278.0	5423.60	5427.07	5426.30	5427.24	0.002813	3.31	84.06	59.01	0.49			3.31	3.47
88	278.0	5423.60	5426.93	5426.09	5427.17	0.002614	3.91	71.05	36.04	0.49			3.91	3.33
87.875*	278.0	5423.66	5426.86	5426.14	5427.13	0.003234	4.21	65.96	35.26	0.54			4.21	3.19
87.75*	278.0	5423.72	5426.76	5426.17	5427.08	0.004088	4.58	60.76	34.32	0.61			4.58	3.04
87.625*	278.0	5423.78	5426.63	5426.19	5427.02	0.005264	5.02	55.41	32.95	0.68			5.02	2.85
87.5	278.0	5423.84	5426.38	5426.19	5426.92	0.008448	5.91	47.07	31.25	0.85			5.91	2.53
87.3333*	278.0	5423.84	5426.30	5426.02	5426.76	0.006827	5.43	51.16	32.88	0.77			5.43	2.46
87.1666*	278.0	5423.84	5426.26	5425.85	5426.64	0.005275	4.96	56.07	34.01	0.68			4.96	2.42
87	278.0	5423.84	5426.22	5425.68	5426.54	0.004154	4.56	60.95	34.83	0.61			4.56	2.37
86.74	278.0	5423.82	5426.14	5425.60	5426.42	0.004207	4.30	64.61	40.87	0.60			4.30	2.32
86.62*	278.0	5423.73	5426.10	5425.58	5426.36	0.005133	4.09	67.96	54.07	0.64			4.09	2.37
86.5	278.0	5423.64	5425.62	5425.62	5426.24	0.012743	6.31	44.07	35.94	1.00			6.31	1.98
86.3849*	278.0	5423.55	5425.30	5425.49	5426.01	0.026179	6.75	41.16	52.58	1.35			6.75	1.75
86.27	278.0	5423.47	5425.59	5425.04	5425.83	0.003396	3.91	71.19	44.08	0.54			3.91	2.12
86.1349*	278.0	5423.31	5425.48	5425.00	5425.77	0.004541	4.34	64.04	42.22	0.62			4.34	2.17
86	278.0	5423.15	5425.26	5425.05	5425.68	0.007588	5.18	53.63	39.85	0.79			5.18	2.11
85.8*	278.0	5422.90	5425.20	5424.84	5425.52	0.005372	4.60	60.46	41.73	0.67			4.60	2.30
85.6	278.0	5422.64	5425.15	5424.64	5425.41	0.003873	4.09	68.01	43.82	0.58			4.09	2.51
85.35*	278.0	5422.58	5425.06	5424.52	5425.32	0.003707	4.08	68.19	42.69	0.57			4.08	2.48
85.1*	278.0	5422.52	5424.97	5424.40	5425.23	0.003526	4.04	68.83	42.02	0.56			4.04	2.45
84.85	278.0	5422.46	5424.89	5424.30	5425.14	0.003370	3.99	69.61	41.73	0.54			3.99	2.43
84.6833*	278.0	5422.36	5424.83	5424.36	5425.08	0.004026	4.00	69.42	47.72	0.59			4.00	2.47
84.5166*	278.0	5422.27	5424.53	5424.42	5424.96	0.009945	5.26	52.80	47.64	0.88			5.26	2.26
84.35	278.0	5422.17	5424.38	5424.16	5424.81	0.008294	5.28	52.61	40.69	0.82			5.28	2.20
84.2333*	278.0	5422.17	5424.44	5424.10	5424.67	0.005330	3.89	71.55	63.76	0.65			3.89	2.26
84.1166*	278.0	5422.17	5424.41	5423.98	5424.60	0.003988	3.52	79.00	75.89	0.57			3.52	2.24
84	278.0	5422.17	5424.41	5423.83	5424.54	0.002803	2.95	94.14	78.62	0.48			2.95	2.24
83.75	278.0	5422.39	5424.10	5424.03	5424.41	0.011241	4.53	61.40	88.84	0.89			4.53	1.70
83.625*	278.0	5422.08	5424.20	5423.41	5424.26	0.001112	1.98	140.34	106.64	0.30			1.98	2.12
83.5	278.0	5421.77	5424.22	5422.87	5424.24	0.000253	1.10	252.06	151.69	0.15			1.10	2.45
83.3849*	278.0	5421.42	5424.19	5422.86	5424.23	0.000515	1.66	167.42	92.78	0.22			1.66	2.77
83.27	278.0	5421.08	5424.00	5423.13	5424.21	0.002307	3.62	76.74	40.14	0.46			3.62	2.92
83	278.0	5420.96	5423.94	5423.14	5424.14	0.002472	3.62	76.80	42.22	0.47			3.62	2.98
82.8825*	278.0	5420.96	5423.97	5422.98	5424.09	0.001409	2.77	100.34	54.57	0.36			2.77	3.01
82.765*	278.0	5420.96	5423.98	5422.84	5424.07	0.001029	2.33	119.08	66.37	0.31			2.33	3.02
82.6475*	278.0	5420.97	5423.98	5422.73	5424.05	0.000868	2.08	133.41	77.70	0.28			2.08	3.01
82.53	278.0	5420.97	5423.98	5422.64	5424.04	0.000712	1.93	143.96	80.97	0.26			1.93	3.01
82.3999*	278.0	5420.95	5423.96	5422.62	5424.03	0.000700	2.10	132.53	64.77	0.26			2.10	3.01
82.27	278.0	5420.93	5423.88	5422.71	5424.01	0.001282	2.93	94.81	42.95	0.35			2.93	2.95
82.1349*	278.0	5421.01	5423.79	5422.90	5423.98	0.002074	3.49	79.73	40.27	0.44			3.49	2.78
82	278.0	5421.09	5423.63	5423.11	5423.93	0.004151	4.44	62.67	37.36	0.60			4.44	2.54

Profile Output Table - No Name Arroyo Reconstructed Channel 10yr-6hr
 HEC-RAS Plan: Postmine River: No Name Reach: Reach 1 Profile: PF 2

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Vel Lt (ft/s)	Vel Rt (ft/s)	Vel Total (ft/s)	Max Chnl Depth (ft)
81.875*	278.0	5421.00	5423.54	5423.13	5423.87	0.004912	4.59	60.52	39.17	0.65			4.59	2.54
81.75*	278.0	5420.92	5423.44	5423.11	5423.81	0.005942	4.83	57.59	40.00	0.71			4.83	2.52
81.625*	278.0	5420.83	5423.34	5423.06	5423.73	0.006731	5.01	55.53	40.00	0.75			5.01	2.51
81.5	278.0	5420.75	5423.08	5423.01	5423.61	0.010679	5.83	47.65	38.50	0.92			5.83	2.33
81.25	278.0	5420.52	5422.79	5422.79	5423.32	0.012644	5.85	47.50	44.48	0.99			5.85	2.27
81.125*	278.0	5420.39	5422.39	5422.54	5423.11	0.020215	6.78	41.02	42.96	1.22			6.78	2.00
81	278.0	5420.26	5422.71	5422.33	5422.95	0.005377	3.98	69.93	60.43	0.65			3.98	2.45
80.875*	278.0	5420.13	5422.62	5422.20	5422.88	0.004761	4.16	66.76	49.05	0.63			4.16	2.49
80.75	278.0	5420.01	5422.51	5422.09	5422.82	0.004915	4.45	62.51	42.35	0.65			4.45	2.50
80.5	278.0	5419.78	5422.13	5422.04	5422.63	0.009781	5.70	48.76	38.07	0.89			5.70	2.35
80.25*	278.0	5419.54	5421.89	5421.80	5422.39	0.009728	5.69	48.86	38.10	0.89			5.69	2.35
80	278.0	5419.29	5421.64	5421.55	5422.14	0.009738	5.69	48.83	38.07	0.89			5.69	2.35
79.775*	278.0	5419.07	5421.42	5421.31	5421.92	0.009760	5.70	48.79	38.07	0.89			5.70	2.35
79.55	278.0	5418.85	5421.19	5421.09	5421.70	0.009967	5.74	48.47	38.03	0.90			5.74	2.34
79.465*	278.0	5418.77	5421.11	5421.02	5421.62	0.009977	5.73	48.51	38.15	0.90			5.73	2.34
79.38*	278.0	5418.69	5421.03	5420.93	5421.53	0.009807	5.69	48.83	38.30	0.89			5.69	2.34
79.295*	278.0	5418.60	5420.95	5420.86	5421.45	0.009737	5.67	49.00	38.44	0.89			5.67	2.35
79.21*	278.0	5418.52	5420.87	5420.77	5421.36	0.009610	5.64	49.28	38.59	0.88			5.64	2.35
79.125*	278.0	5418.44	5420.79	5420.68	5421.28	0.009291	5.57	49.87	38.78	0.87			5.57	2.35
79.04	278.0	5418.36	5420.72	5420.58	5421.19	0.009111	5.53	50.25	38.96	0.86			5.53	2.36
78.77	278.0	5418.10	5420.45	5420.34	5420.95	0.009421	5.62	49.44	38.33	0.87			5.62	2.35
78.5	278.0	5417.83	5420.20	5420.09	5420.69	0.009258	5.60	49.64	38.20	0.87			5.60	2.37
78.375*	278.0	5417.71	5420.07	5419.95	5420.57	0.009680	5.70	48.77	37.83	0.88			5.70	2.36
78.25*	278.0	5417.58	5419.94	5419.82	5420.45	0.009954	5.74	48.46	38.06	0.90			5.74	2.36
78.125*	278.0	5417.46	5419.80	5419.71	5420.32	0.010150	5.77	48.18	38.06	0.90			5.77	2.34
78	278.0	5417.34	5419.69	5419.57	5420.19	0.009730	5.69	48.84	38.07	0.89			5.69	2.35
77.7966*	278.0	5417.14	5419.49	5419.37	5419.99	0.009860	5.71	48.66	38.12	0.89			5.71	2.35
77.5933*	278.0	5416.94	5419.28	5419.17	5419.79	0.009960	5.73	48.51	38.32	0.90	0.15		5.73	2.34
77.39	278.0	5416.74	5419.10	5418.98	5419.59	0.009171	5.65	50.98	48.09	0.87	1.05		5.45	2.36
77.2666*	278.0	5416.62	5418.98	5418.86	5419.48	0.009715	5.68	48.95	38.37	0.89	0.07		5.68	2.36
77.1433*	278.0	5416.50	5418.86	5418.74	5419.36	0.009699	5.68	48.94	38.21	0.88			5.68	2.36
77.02*	278.0	5416.38	5418.74	5418.61	5419.24	0.009678	5.68	48.93	38.12	0.88			5.68	2.36
76.8966*	278.0	5416.26	5418.61	5418.50	5419.12	0.009770	5.70	48.74	38.01	0.89			5.70	2.35
76.7733*	278.0	5416.14	5418.49	5418.38	5419.00	0.009766	5.71	48.69	37.89	0.89			5.71	2.35
76.65	278.0	5416.02	5418.37	5418.25	5418.88	0.009673	5.70	48.80	37.81	0.88			5.70	2.35
76.4666*	278.0	5415.84	5418.20	5418.07	5418.69	0.009438	5.64	49.26	38.01	0.87			5.64	2.36
76.2833*	278.0	5415.66	5418.02	5417.89	5418.52	0.009475	5.65	49.23	38.08	0.88			5.65	2.36
76.1	278.0	5415.48	5417.74	5417.72	5418.32	0.011976	6.09	45.64	37.58	0.97			6.09	2.26
75.984*	278.0	5415.36	5417.62	5417.58	5418.17	0.011631	5.98	46.49	38.53	0.96			5.98	2.26
75.868*	278.0	5415.25	5417.49	5417.44	5418.03	0.011360	5.88	47.25	39.46	0.95			5.88	2.24
75.752*	278.0	5415.13	5417.40	5417.31	5417.89	0.010222	5.64	49.30	40.57	0.90			5.64	2.27
75.6359*	278.0	5415.02	5417.32	5417.17	5417.77	0.009021	5.37	51.78	41.80	0.85			5.37	2.30
75.52	278.0	5414.90	5417.29	5417.04	5417.65	0.006574	4.89	59.72	51.06	0.74	1.44		4.66	2.39
75.3466*	278.0	5414.74	5417.16	5416.92	5417.53	0.006592	4.95	58.62	49.71	0.74	1.31		4.74	2.41
75.1733*	278.0	5414.57	5417.01	5416.77	5417.41	0.006805	5.07	56.94	48.15	0.75	1.17		4.88	2.44
75	278.0	5414.41	5416.75	5416.65	5417.26	0.009651	5.73	49.34	43.49	0.88	0.95		5.63	2.34
74.8*	278.0	5414.21	5416.56	5416.44	5417.06	0.009369	5.68	49.69	42.23	0.87	1.02		5.59	2.35
74.6*	278.0	5414.01	5416.41	5416.24	5416.87	0.008239	5.45	51.86	42.17	0.82	1.11		5.36	2.40
74.4	278.0	5413.81	5416.30	5416.05	5416.71	0.006770	5.12	55.36	42.56	0.75	1.17		5.02	2.49
74.2*	278.0	5413.62	5416.22	5415.85	5416.57	0.005549	4.72	58.89	39.85	0.68			4.72	2.60
74	278.0	5413.43	5416.16	5415.66	5416.45	0.004261	4.33	64.23	40.59	0.61			4.33	2.73
73.9166*	278.0	5413.34	5416.15	5415.59	5416.41	0.003680	4.11	67.57	41.27	0.57			4.11	2.81
73.8333*	278.0	5413.26	5416.13	5415.49	5416.37	0.003222	3.93	70.77	41.93	0.53			3.93	2.87
73.75	278.0	5413.17	5416.12	5415.41	5416.34	0.002790	3.74	74.40	48.08	0.50			3.74	2.95
73.5	278.0	5412.92	5416.09	5415.16	5416.27	0.002030	3.37	82.39	54.03	0.43			3.37	3.17
73.375*	278.0	5412.80	5416.08	5415.09	5416.24	0.001816	3.25	85.49	47.28	0.41			3.25	3.28
73.25	278.0	5412.68	5416.08	5414.93	5416.21	0.001317	2.95	99.92	56.89	0.35	0.22	0.86	2.78	3.40
73	278.0	5412.44	5416.06	5414.66	5416.18	0.000976	2.70	106.64	52.32	0.31	0.67		2.61	3.62
72.77	278.0	5412.20	5416.06	5414.43	5416.15	0.000841	2.34	118.92	56.11	0.28			2.34	3.86
72.615*	278.0	5412.05	5416.06	5414.19	5416.13	0.000543	2.08	133.60	54.08	0.23			2.08	4.01
72.46	278.0	5411.90	5416.07	5413.94	5416.12	0.000380	1.86	149.82	56.58	0.20			1.86	4.17
72.23	278.0	5411.77	5415.95	5414.34	5416.10	0.001393	3.07	90.49	46.29	0.36			3.07	4.18
72.1150*	278.0	5411.79	5415.82	5414.65	5416.07	0.002712	3.94	70.47	36.04	0.50			3.94	4.03
72	278.0	5411.82	5415.51	5415.15	5416.00	0.006432	5.62	49.48	27.98	0.74			5.62	3.69
71.78	278.0	5411.71	5415.25	5415.10	5415.82	0.009856	6.05	45.98	32.43	0.89			6.05	3.54
71.6866*	278.0	5411.68	5415.24	5414.96	5415.70	0.009340	5.45	50.97	40.71	0.86			5.45	3.56
71.5933*	278.0	5411.66	5415.22	5415.02	5415.59	0.008129	4.84	57.41	49.51	0.79			4.84	3.56
71.5	278.0	5411.63	5414.75	5414.75	5415.47	0.012222	6.80	40.90	38.73	0.99			6.80	3.12
71.375*	278.0	5411.47	5413.99	5414.38	5415.19	0.024941	8.79	31.63	25.58	1.39			8.79	2.52
71.25*	278.0	5411.31	5413.51	5413.91	5414.79	0.037472	9.07	30.67	32.73	1.65			9.07	2.20
71.125*	278.0	5411.15	5413.15	5413.49	5414.33	0.031437	8.74	31.83	31.65	1.54			8.74	2.00

Profile Output Table - No Name Arroyo Reconstructed Channel 10yr-6hr
 HEC-RAS Plan: Postmine River: No Name Reach: Reach 1 Profile: PF 2

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Vel Lt (ft/s)	Vel Rt (ft/s)	Vel Total (ft/s)	Max Chnl Depth (ft)
71	278.0	5410.99	5412.81	5413.11	5413.97	0.026499	8.67	32.05	27.80	1.42			8.67	1.82
70.875*	278.0	5410.89	5413.19	5413.14	5413.80	0.011188	6.25	44.48	33.47	0.96			6.25	2.30
70.75	278.0	5410.79	5413.09	5413.02	5413.64	0.010650	5.94	46.86	37.88	0.93	0.59		5.93	2.30
70.6166*	278.0	5410.69	5412.97	5412.89	5413.49	0.010516	5.80	47.92	38.63	0.92			5.80	2.28
70.4833*	278.0	5410.58	5412.94	5412.76	5413.32	0.008112	4.97	55.92	46.89	0.80			4.97	2.36
70.35	278.0	5410.48	5413.01	5412.42	5413.19	0.002806	3.43	81.83	55.96	0.49		0.82	3.40	2.53
70.175*	278.0	5410.35	5412.86	5412.46	5413.12	0.004859	4.12	67.47	51.17	0.63			4.12	2.51
70	278.0	5410.22	5412.77	5412.37	5413.03	0.004944	4.15	66.96	50.72	0.64			4.15	2.55
69.75*	278.0	5410.04	5412.60	5412.23	5412.90	0.005342	4.42	62.86	45.82	0.67			4.42	2.56
69.5	278.0	5409.85	5412.35	5412.08	5412.74	0.006618	5.06	55.41	41.16	0.74	0.86		5.02	2.50
69.3333*	278.0	5409.72	5412.25	5411.95	5412.63	0.006400	4.96	56.12	39.83	0.73	0.25		4.95	2.53
69.1666*	278.0	5409.59	5412.16	5411.82	5412.52	0.006010	4.84	57.48	39.83	0.71			4.84	2.57
69	278.0	5409.46	5412.07	5411.69	5412.42	0.005553	4.71	59.02	40.10	0.68			4.71	2.61
68.75*	278.0	5409.27	5411.97	5411.52	5412.28	0.004576	4.43	62.72	40.35	0.63			4.43	2.70
68.5	278.0	5409.08	5411.90	5411.33	5412.16	0.003643	4.11	67.58	49.04	0.56			4.11	2.82
68.375*	278.0	5408.98	5411.87	5411.23	5412.11	0.003228	3.95	70.35	52.34	0.53			3.95	2.89
68.25	278.0	5408.88	5411.85	5411.10	5412.07	0.002845	3.79	73.38	55.61	0.50			3.79	2.97
68.13	278.0	5408.78	5411.91	5410.94	5412.01	0.001246	2.70	115.85	64.68	0.34	1.43		2.40	3.13
67.99	278.0	5408.64	5411.92	5410.32	5411.98	0.000582	2.05	135.47	59.29	0.24			2.05	3.28
67.89*	278.0	5408.58	5411.90	5410.48	5411.98	0.000768	2.22	125.03	59.83	0.27			2.22	3.32
67.79	278.0	5408.51	5411.89	5410.59	5411.97	0.000874	2.31	120.48	60.00	0.29			2.31	3.38
67.65	278.0	5408.41	5411.82	5410.63	5411.95	0.001321	2.85	97.54	47.96	0.35			2.85	3.41
67.4	278.0	5408.21	5411.79	5410.46	5411.92	0.001268	2.82	98.72	47.82	0.35			2.82	3.58
67.2*	278.0	5407.99	5411.72	5410.40	5411.88	0.001640	3.20	86.82	42.02	0.39			3.20	3.73
67	278.0	5407.77	5411.52	5410.81	5411.82	0.003815	4.43	62.82	34.97	0.58			4.43	3.75
66.75*	278.0	5407.70	5411.42	5410.75	5411.73	0.003643	4.46	62.32	33.24	0.57			4.46	3.72
66.5	278.0	5407.63	5411.31	5410.59	5411.64	0.003761	4.61	60.25	31.21	0.59			4.61	3.68
66.255*	278.0	5407.58	5411.13	5410.55	5411.53	0.004618	5.07	54.80	28.58	0.65			5.07	3.55
66.01	278.0	5407.52	5410.86	5410.58	5411.38	0.007410	5.80	47.95	28.28	0.78			5.80	3.34
65.84*	278.0	5407.39	5410.52	5410.38	5411.22	0.009686	6.72	41.38	24.44	0.91			6.72	3.13
65.67*	278.0	5407.25	5410.43	5410.18	5411.05	0.007971	6.32	44.01	24.89	0.84			6.32	3.18
65.5	278.0	5407.12	5410.42	5409.99	5410.88	0.005691	5.46	50.93	27.95	0.71			5.46	3.30
65.25*	278.0	5406.85	5410.33	5409.81	5410.73	0.005174	5.04	55.19	31.85	0.67			5.04	3.48
65	278.0	5406.58	5409.86	5409.80	5410.52	0.010832	6.53	42.55	28.60	0.94			6.53	3.28
64.8*	278.0	5406.58	5409.77	5409.48	5410.30	0.007425	5.84	47.64	28.88	0.80			5.84	3.19
64.6*	278.0	5406.58	5409.68	5409.25	5410.15	0.006049	5.49	50.64	28.89	0.73			5.49	3.10
64.4	278.0	5406.58	5409.57	5409.05	5410.02	0.005583	5.38	51.70	28.49	0.70			5.38	2.99
64.175*	278.0	5406.38	5409.55	5409.03	5409.86	0.004788	4.47	62.22	40.76	0.64			4.47	3.17
63.95	278.0	5406.17	5409.55	5409.02	5409.74	0.003387	3.49	79.66	58.02	0.52			3.49	3.38
63.7633*	278.0	5405.99	5409.42	5408.93	5409.66	0.004342	3.91	71.14	53.10	0.59			3.91	3.43
63.5766*	278.0	5405.81	5409.29	5408.79	5409.57	0.004891	4.27	65.06	46.67	0.64			4.27	3.48
63.39	278.0	5405.63	5409.14	5408.69	5409.47	0.005462	4.61	60.31	42.00	0.68			4.61	3.51
63.2066*	278.0	5405.46	5409.11	5408.49	5409.36	0.003755	4.02	69.13	44.61	0.57			4.02	3.65
63.0233*	278.0	5405.30	5409.11	5408.18	5409.28	0.002170	3.36	82.75	46.22	0.44			3.36	3.81
62.84	278.0	5405.13	5409.11	5407.77	5409.24	0.001195	2.81	98.87	45.76	0.34			2.81	3.98
62.6	278.0	5405.13	5409.11	5407.60	5409.20	0.000810	2.42	115.02	50.08	0.28			2.42	3.98
62.475*	278.0	5405.13	5409.03	5407.90	5409.18	0.001629	3.15	88.31	43.78	0.39			3.15	3.90
62.35	278.0	5405.13	5408.88	5407.96	5409.15	0.002799	4.16	66.86	31.88	0.51			4.16	3.75
62.175*	278.0	5405.10	5408.78	5408.10	5409.09	0.003812	4.46	62.28	34.29	0.58			4.46	3.68
62	278.0	5405.08	5408.63	5408.03	5409.00	0.005325	4.88	56.95	35.19	0.68			4.88	3.55
61.75*	278.0	5405.03	5408.26	5408.04	5408.82	0.008283	5.98	46.47	29.56	0.84			5.98	3.23
61.5	278.0	5404.98	5408.12	5407.76	5408.62	0.006352	5.65	49.22	27.75	0.75			5.65	3.14
61.25*	278.0	5404.82	5407.99	5407.65	5408.44	0.006512	5.42	51.27	31.72	0.75			5.42	3.17
61	278.0	5404.66	5407.96	5407.38	5408.26	0.004107	4.37	63.55	38.56	0.60			4.37	3.30
60.75*	278.0	5404.53	5407.92	5407.12	5408.16	0.002779	3.90	71.35	38.42	0.50			3.90	3.39
60.5	278.0	5404.39	5407.88	5406.92	5408.09	0.002245	3.69	75.25	37.16	0.46			3.69	3.48
60.25*	278.0	5404.26	5407.73	5406.93	5408.02	0.003138	4.27	65.13	33.29	0.54			4.27	3.47
60	278.0	5404.13	5407.52	5406.89	5407.91	0.004374	5.02	55.34	28.20	0.63			5.02	3.39
59.75*	278.0	5404.00	5407.45	5406.74	5407.80	0.003919	4.74	58.65	30.06	0.60			4.74	3.45
59.5	278.0	5403.88	5407.32	5406.68	5407.69	0.004373	4.90	56.72	29.73	0.63			4.90	3.44
59.25*	278.0	5403.84	5407.17	5406.68	5407.57	0.005119	5.08	54.69	30.98	0.67			5.08	3.33
59	278.0	5403.80	5407.04	5406.63	5407.44	0.005655	5.12	54.29	32.69	0.70			5.12	3.23
58.82*	278.0	5403.67	5406.97	5406.48	5407.34	0.004722	4.84	57.40	32.96	0.65			4.84	3.30
58.64*	278.0	5403.54	5406.92	5406.26	5407.25	0.003955	4.63	60.04	38.12	0.60			4.63	3.38
58.46	278.0	5403.41	5406.86	5406.11	5407.18	0.003436	4.50	61.82	39.86	0.56			4.50	3.45
58.23*	278.0	5403.30	5406.78	5406.02	5407.10	0.003479	4.51	61.68	41.53	0.57			4.51	3.48
58	278.0	5403.19	5406.68	5405.92	5407.01	0.003711	4.63	60.09	43.95	0.58			4.63	3.49
57.8825*	278.0	5403.17	5406.65	5405.89	5406.96	0.003516	4.51	61.67	41.83	0.57			4.51	3.48
57.765*	278.0	5403.16	5406.61	5405.77	5406.92	0.003298	4.42	62.85	55.15	0.55			4.42	3.45
57.6475*	278.0	5403.14	5406.58	5405.81	5406.88	0.003175	4.39	63.29	69.49	0.54			4.39	3.44
57.53	278.0	5403.12	5406.54	5405.77	5406.84	0.003186	4.43	62.81	79.77	0.54			4.43	3.42

Profile Output Table - No Name Arroyo Reconstructed Channel 10yr-6hr
 HEC-RAS Plan: Postmine River: No Name Reach: Reach 1 Profile: PF 2

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Vel Lt (ft/s)	Vel Rt (ft/s)	Vel Total (ft/s)	Max Chnl Depth (ft)
57.38	278.0	5403.07	5406.63	5405.75	5406.75	0.001266	3.27	120.28	71.03	0.36	1.39	1.14	2.31	3.56
57.23	278.0	5403.06	5406.56	5405.36	5406.73	0.001468	3.28	86.98	41.71	0.38		0.84	3.20	3.50
57	278.0	5403.03	5406.34	5405.49	5406.67	0.003335	4.56	60.98	29.28	0.56			4.56	3.31
56.75*	278.0	5402.90	5406.21	5405.45	5406.57	0.003936	4.80	57.92	29.25	0.60			4.80	3.31
56.5	278.0	5402.77	5406.09	5405.44	5406.47	0.004081	4.94	56.32	27.90	0.61			4.94	3.32
56.375*	278.0	5402.67	5406.03	5405.40	5406.42	0.004248	5.00	55.57	27.81	0.62			5.00	3.36
56.25*	278.0	5402.58	5405.95	5405.36	5406.36	0.004441	5.09	54.62	27.99	0.64		0.34	5.09	3.37
56.125*	278.0	5402.48	5405.88	5405.30	5406.30	0.004586	5.19	53.93	31.24	0.65	0.21	0.75	5.16	3.40
56	278.0	5402.38	5405.81	5405.25	5406.24	0.004519	5.24	55.85	46.28	0.65	0.57	1.06	4.98	3.43
55.875*	278.0	5402.38	5405.73	5405.20	5406.18	0.004784	5.38	53.02	42.59	0.66	0.37	0.97	5.24	3.35
55.75*	278.0	5402.38	5405.65	5405.16	5406.12	0.005049	5.51	50.93	49.28	0.68	0.29	0.87	5.46	3.27
55.625*	278.0	5402.38	5405.54	5405.10	5406.05	0.005596	5.73	48.81	69.91	0.71		0.73	5.70	3.16
55.5	278.0	5402.38	5405.39	5405.05	5405.97	0.006661	6.10	45.65	74.34	0.77		0.39	6.09	3.01
55.375*	278.0	5402.38	5405.40	5404.93	5405.86	0.005298	5.45	51.11	84.05	0.69		0.39	5.44	3.02
55.25*	278.0	5402.38	5405.39	5404.85	5405.77	0.004431	4.96	56.12	96.22	0.63		0.39	4.95	3.01
55.125*	278.0	5402.38	5405.38	5404.77	5405.71	0.003861	4.59	60.66	113.45	0.59		0.37	4.58	3.00
55	278.0	5402.38	5405.36	5404.72	5405.65	0.003439	4.29	64.93	132.71	0.56		0.36	4.28	2.98
54.875*	278.0	5402.38	5405.29	5404.71	5405.60	0.003935	4.48	62.04	130.92	0.59			4.48	2.91
54.75*	278.0	5402.38	5405.21	5404.71	5405.55	0.004501	4.71	59.06	128.76	0.63			4.71	2.83
54.625*	278.0	5402.37	5405.09	5404.70	5405.49	0.005463	5.03	55.23	124.57	0.69			5.03	2.72
54.5	278.0	5402.37	5404.85	5404.69	5405.38	0.008583	5.89	47.22	100.72	0.85			5.89	2.47
54.25*	278.0	5402.29	5404.79	5404.79	5405.15	0.005819	5.07	77.37	129.48	0.71	1.11		3.59	2.50
54	278.0	5402.20	5404.58	5404.62	5404.98	0.006909	5.46	75.14	125.54	0.77	1.29		3.70	2.38
53.8233*	278.0	5402.10	5404.34	5404.46	5404.82	0.010136	5.96	67.02	132.66	0.91	1.35		4.15	2.24
53.6466*	278.0	5402.01	5404.31	5404.30	5404.61	0.006875	4.87	90.37	166.49	0.75	1.38	0.74	3.08	2.30
53.47	278.0	5401.91	5404.32	5404.28	5404.47	0.003907	3.70	126.15	198.40	0.57	1.28	1.06	2.20	2.41
Max							8.67							
Min							1.86							
Avg							4.82							
													Avg	4.79

Only the reconstructed channel reaches were included in determining the maximum, minimum, and average velocities. The reconstructed reaches are from Station 81.50 to 72.23 and from Station 71.00 to 67.00.

Profile Output Table - No Name Arroyo Reconstructed Channel 25yr-6hr
 HEC-RAS Plan: Postmine River: No Name Reach: Reach 1 Profile: PF 3

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Vel Lt (ft/s)	Vel Rt (ft/s)	Vel Total (ft/s)	Max Chnl Depth (ft)
92	457.0	5430.37	5436.07	5431.98	5436.10	0.000110	1.34	340.47	79.78	0.11			1.34	5.70
91.8925*	457.0	5430.22	5436.05	5432.24	5436.09	0.000172	1.64	279.30	67.28	0.14			1.64	5.83
91.785*	457.0	5430.07	5436.02	5432.54	5436.09	0.000284	2.05	223.11	55.38	0.18			2.05	5.95
91.6775*	457.0	5429.92	5435.97	5432.86	5436.08	0.000515	2.67	171.37	43.86	0.24			2.67	6.05
91.57	457.0	5429.77	5435.85	5433.28	5436.06	0.001100	3.71	123.07	32.64	0.34			3.71	6.08
91.465*	457.0	5429.59	5435.75	5433.63	5436.04	0.001669	4.33	105.52	30.43	0.41			4.33	6.16
91.36*	457.0	5429.42	5435.60	5433.93	5436.01	0.002505	5.11	89.58	28.66	0.50	0.25		5.10	6.18
91.255*	457.0	5429.25	5435.36	5434.25	5435.95	0.003958	6.20	74.10	26.21	0.61	0.55		6.17	6.11
91.15	457.0	5429.07	5434.48	5434.48	5435.82	0.011427	9.28	49.27	18.24	0.99			9.28	5.41
91.0533*	457.0	5428.81	5433.06	5433.86	5435.52	0.028795	12.58	36.32	17.87	1.56			12.58	4.25
90.9566*	457.0	5428.55	5432.48	5433.38	5435.18	0.036758	13.19	34.65	19.48	1.74			13.19	3.92
90.86	457.0	5428.29	5432.07	5433.00	5434.80	0.039779	13.26	34.47	20.56	1.80			13.26	3.78
90.6	457.0	5427.43	5431.06	5431.99	5433.84	0.034131	13.37	34.18	31.12	1.70			13.37	3.63
90.45*	457.0	5426.88	5430.11	5431.11	5433.21	0.044769	14.15	32.30	19.36	1.93			14.15	3.23
90.3	457.0	5426.33	5429.10	5430.15	5432.46	0.052368	14.73	31.03	19.87	2.08			14.73	2.77
90.2*	457.0	5426.29	5428.49	5429.44	5431.84	0.069175	14.70	31.09	25.32	2.34			14.70	2.20
90.1*	457.0	5426.25	5428.06	5428.86	5430.98	0.077850	13.73	33.29	33.24	2.42			13.73	1.80
90	457.0	5426.21	5427.68	5428.37	5430.07	0.072734	12.42	36.79	40.66	2.30			12.42	1.46
89.875*	457.0	5425.98	5427.81	5428.23	5429.20	0.028839	9.44	48.39	40.31	1.52			9.44	1.83
89.75*	457.0	5425.75	5428.27	5428.06	5428.89	0.008076	6.33	72.19	42.00	0.85			6.33	2.52
89.625*	457.0	5425.52	5428.15	5427.93	5428.79	0.007934	6.41	71.32	40.10	0.85			6.41	2.63
89.5	457.0	5425.29	5427.81	5427.81	5428.65	0.011465	7.37	62.00	37.08	1.00			7.37	2.52
89.4166*	457.0	5425.08	5427.42	5427.63	5428.52	0.016831	8.41	54.36	35.69	1.20			8.41	2.34
89.3333*	457.0	5424.87	5427.91	5427.46	5428.40	0.005294	5.64	81.00	40.43	0.70			5.64	3.04
89.25	457.0	5424.66	5427.94	5427.22	5428.34	0.003582	5.03	90.79	39.84	0.59			5.03	3.28
89.125*	457.0	5424.40	5428.03	5427.00	5428.25	0.002035	3.77	121.26	54.52	0.45			3.77	3.63
89	457.0	5424.13	5428.04	5426.69	5428.21	0.001630	3.24	141.21	67.64	0.39			3.24	3.91
88.8266*	457.0	5423.95	5428.02	5426.84	5428.17	0.001795	3.18	143.82	76.55	0.41			3.18	4.07
88.6533*	457.0	5423.77	5427.97	5426.94	5428.14	0.002260	3.27	139.71	84.76	0.45			3.27	4.20
88.48	457.0	5423.59	5427.90	5426.89	5428.09	0.002779	3.56	128.42	80.01	0.49			3.56	4.31
88.2400*	457.0	5423.60	5427.85	5426.86	5428.03	0.001923	3.46	132.17	65.11	0.43			3.46	4.25
88	457.0	5423.60	5427.61	5426.64	5427.96	0.002807	4.76	96.03	37.95	0.53			4.76	4.01
87.875*	457.0	5423.66	5427.52	5426.70	5427.92	0.003393	5.08	89.93	37.30	0.58			5.08	3.86
87.75*	457.0	5423.72	5427.40	5426.74	5427.86	0.004199	5.47	83.53	36.51	0.64			5.47	3.68
87.625*	457.0	5423.78	5427.24	5426.75	5427.80	0.005405	5.97	76.50	35.48	0.72			5.97	3.46
87.5	457.0	5423.84	5426.85	5426.76	5427.68	0.009837	7.34	62.25	33.25	0.95			7.34	3.00
87.3333*	457.0	5423.84	5426.78	5426.57	5427.50	0.008031	6.79	67.28	34.75	0.86			6.79	2.94
87.1666*	457.0	5423.84	5426.73	5426.38	5427.35	0.006502	6.30	72.58	35.79	0.78			6.30	2.89
87	457.0	5423.84	5426.68	5426.21	5427.22	0.005405	5.89	77.54	36.57	0.71			5.89	2.84
86.74	457.0	5423.82	5426.61	5426.14	5427.07	0.004951	5.42	84.24	42.28	0.68			5.42	2.79
86.62*	457.0	5423.73	5426.64	5426.14	5426.97	0.004547	4.59	99.49	60.62	0.63			4.59	2.91
86.5	457.0	5423.64	5426.30	5426.30	5426.86	0.013229	6.00	76.11	69.19	1.01			6.00	2.66
86.3849*	457.0	5423.55	5426.22	5425.85	5426.57	0.005314	4.72	96.75	63.55	0.67			4.72	2.67
86.27	457.0	5423.47	5426.17	5425.48	5426.52	0.003446	4.70	97.14	49.59	0.57			4.70	2.70
86.1349*	457.0	5423.31	5426.03	5425.52	5426.45	0.004549	5.21	87.78	43.77	0.65			5.21	2.72
86	457.0	5423.15	5425.76	5425.52	5426.36	0.007495	6.19	73.83	41.34	0.82			6.19	2.61
85.8*	457.0	5422.90	5425.71	5425.29	5426.19	0.005468	5.55	82.32	43.06	0.71			5.55	2.81
85.6	457.0	5422.64	5425.68	5425.09	5426.07	0.004093	5.00	91.42	45.02	0.62			5.00	3.04
85.35*	457.0	5422.58	5425.57	5424.98	5425.97	0.004165	5.05	90.43	44.51	0.62			5.05	2.99
85.1*	457.0	5422.52	5425.46	5424.86	5425.86	0.004174	5.10	89.62	43.50	0.63			5.10	2.94
84.85	457.0	5422.46	5425.35	5424.76	5425.76	0.004193	5.13	89.15	43.01	0.63			5.13	2.89
84.6833*	457.0	5422.36	5425.30	5424.78	5425.68	0.004450	4.95	92.36	49.64	0.64			4.95	2.94
84.5166*	457.0	5422.27	5425.13	5424.90	5425.58	0.007015	5.39	84.86	56.88	0.78			5.39	2.86
84.35	457.0	5422.17	5424.84	5424.73	5425.43	0.009743	6.18	73.90	50.93	0.90			6.18	2.67
84.2333*	457.0	5422.17	5424.98	5424.48	5425.25	0.004310	4.17	109.60	74.85	0.61			4.17	2.81
84.1166*	457.0	5422.17	5424.96	5424.35	5425.20	0.003300	3.86	118.40	88.55	0.54			3.86	2.79
84	457.0	5422.17	5424.98	5424.20	5425.14	0.002146	3.27	139.72	92.81	0.44			3.27	2.81
83.75	457.0	5422.39	5424.87	5424.33	5425.07	0.003375	3.63	125.91	179.00	0.54			3.63	2.48
83.625*	457.0	5422.08	5424.94	5423.68	5425.01	0.000717	2.04	223.72	116.68	0.26			2.04	2.86
83.5	457.0	5421.77	5424.96	5423.14	5424.99	0.000209	1.24	368.28	160.27	0.14			1.24	3.19
83.3849*	457.0	5421.42	5424.92	5423.21	5424.98	0.000468	1.92	237.57	98.00	0.22			1.92	3.50
83.27	457.0	5421.08	5424.64	5423.65	5424.95	0.002512	4.43	103.08	42.10	0.50			4.43	3.56
83	457.0	5420.96	5424.58	5423.63	5424.88	0.002570	4.37	104.60	44.31	0.50			4.37	3.62
82.8825*	457.0	5420.96	5424.64	5423.39	5424.82	0.001414	3.32	137.80	57.08	0.38			3.32	3.68
82.765*	457.0	5420.96	5424.67	5423.27	5424.79	0.000989	2.76	165.49	69.31	0.31			2.76	3.71
82.6475*	457.0	5420.97	5424.68	5423.11	5424.77	0.000791	2.43	188.36	81.13	0.28			2.43	3.70
82.53	457.0	5420.97	5424.68	5423.00	5424.75	0.000689	2.21	206.79	92.50	0.26			2.21	3.71
82.3999*	457.0	5420.95	5424.64	5422.98	5424.74	0.000768	2.57	177.99	68.56	0.28			2.57	3.69
82.27	457.0	5420.93	5424.50	5423.14	5424.72	0.001589	3.74	122.11	44.73	0.40			3.74	3.57
82.1349*	457.0	5421.01	5424.38	5423.37	5424.68	0.002471	4.40	103.85	41.86	0.49			4.40	3.37
82	457.0	5421.09	5424.14	5423.61	5424.62	0.004843	5.57	82.01	38.67	0.67			5.57	3.05

Profile Output Table - No Name Arroyo Reconstructed Channel 25yr-6hr
 HEC-RAS Plan: Postmine River: No Name Reach: Reach 1 Profile: PF 3

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Vel Lt (ft/s)	Vel Rt (ft/s)	Vel Total (ft/s)	Max Chnl Depth (ft)
81.875*	457.0	5421.00	5424.05	5423.60	5424.55	0.005368	5.65	80.89	40.75	0.71			5.65	3.05
81.75*	457.0	5420.92	5423.96	5423.60	5424.48	0.006126	5.81	78.70	42.17	0.75			5.81	3.04
81.625*	457.0	5420.83	5423.84	5423.54	5424.40	0.006814	5.98	76.42	42.38	0.78			5.98	3.01
81.5	457.0	5420.75	5423.50	5423.50	5424.27	0.011748	7.06	64.73	42.12	1.00			7.06	2.75
81.25	457.0	5420.52	5423.13	5423.24	5423.94	0.014685	7.25	63.06	100.40	1.10			7.25	2.61
81.125*	457.0	5420.39	5423.30	5423.01	5423.74	0.006524	5.36	85.33	54.44	0.75			5.36	2.91
81	457.0	5420.26	5423.37	5422.76	5423.62	0.003480	4.04	113.20	68.92	0.56			4.04	3.11
80.875*	457.0	5420.13	5423.24	5422.64	5423.57	0.004003	4.59	99.57	55.44	0.60			4.59	3.11
80.75	457.0	5420.01	5423.08	5422.56	5423.50	0.004782	5.20	87.89	46.03	0.66			5.20	3.07
80.5	457.0	5419.78	5422.61	5422.53	5423.32	0.009775	6.75	67.72	40.94	0.92			6.75	2.83
80.25*	457.0	5419.54	5422.37	5422.28	5423.07	0.009713	6.73	67.88	40.99	0.92			6.73	2.83
80	457.0	5419.29	5422.12	5422.05	5422.83	0.009752	6.74	67.77	40.95	0.92			6.74	2.83
79.775*	457.0	5419.07	5421.90	5421.83	5422.61	0.009799	6.75	67.67	40.95	0.93			6.75	2.83
79.55	457.0	5418.85	5421.67	5421.61	5422.39	0.009940	6.78	67.37	40.93	0.93			6.78	2.82
79.465*	457.0	5418.77	5421.59	5421.52	5422.30	0.009893	6.76	67.56	41.08	0.93			6.76	2.82
79.38*	457.0	5418.69	5421.51	5421.43	5422.21	0.009706	6.72	68.05	41.24	0.92			6.72	2.82
79.295*	457.0	5418.60	5421.43	5421.34	5422.13	0.009592	6.68	68.40	41.40	0.92			6.68	2.83
79.21*	457.0	5418.52	5421.36	5421.24	5422.04	0.009428	6.64	68.87	41.58	0.91			6.64	2.84
79.125*	457.0	5418.44	5421.28	5421.14	5421.95	0.009134	6.56	69.66	41.79	0.90			6.56	2.84
79.04	457.0	5418.36	5421.21	5421.09	5421.87	0.008941	6.51	70.23	41.98	0.89			6.51	2.85
78.77	457.0	5418.10	5420.94	5420.82	5421.63	0.009295	6.63	68.97	41.29	0.90			6.63	2.84
78.5	457.0	5417.83	5420.70	5420.58	5421.37	0.009062	6.58	69.44	41.18	0.89			6.58	2.87
78.375*	457.0	5417.71	5420.57	5420.44	5421.26	0.009379	6.65	68.69	41.18	0.91			6.65	2.86
78.25*	457.0	5417.58	5420.45	5420.32	5421.13	0.009345	6.65	68.74	41.18	0.91			6.65	2.87
78.125*	457.0	5417.46	5420.30	5420.20	5421.01	0.009839	6.76	67.58	41.00	0.93			6.76	2.83
78	457.0	5417.34	5420.19	5420.06	5420.88	0.009417	6.67	68.56	41.06	0.91			6.67	2.85
77.7966*	457.0	5417.14	5419.96	5419.86	5420.67	0.009790	6.76	67.60	41.51	0.93	0.26		6.76	2.82
77.5933*	457.0	5416.94	5419.78	5419.68	5420.47	0.009156	6.70	70.17	50.17	0.90	1.14		6.51	2.84
77.39	457.0	5416.74	5419.75	5419.51	5420.26	0.006160	5.87	87.44	62.44	0.75	1.82		5.23	3.01
77.2666*	457.0	5416.62	5419.48	5419.35	5420.16	0.008893	6.63	70.55	49.59	0.89	1.05		6.48	2.86
77.1433*	457.0	5416.50	5419.37	5419.24	5420.04	0.009159	6.61	69.18	41.61	0.90	0.21		6.61	2.87
77.02*	457.0	5416.38	5419.24	5419.11	5419.92	0.009284	6.64	68.87	41.11	0.90			6.64	2.86
76.8966*	457.0	5416.26	5419.12	5418.99	5419.81	0.009310	6.65	68.73	40.97	0.90			6.65	2.86
76.7733*	457.0	5416.14	5419.00	5418.87	5419.69	0.009339	6.66	68.57	40.81	0.91			6.66	2.86
76.65	457.0	5416.02	5418.85	5418.74	5419.56	0.009661	6.75	67.72	40.56	0.92			6.75	2.83
76.4666*	457.0	5415.84	5418.69	5418.56	5419.38	0.009389	6.67	68.50	40.85	0.91			6.67	2.85
76.2833*	457.0	5415.66	5418.52	5418.38	5419.20	0.009243	6.63	68.93	41.03	0.90			6.63	2.86
76.1	457.0	5415.48	5418.23	5418.23	5419.01	0.011273	7.08	64.59	40.49	0.99			7.08	2.75
75.984*	457.0	5415.36	5417.98	5418.05	5418.86	0.013829	7.51	60.84	40.71	1.08			7.51	2.62
75.868*	457.0	5415.25	5417.83	5417.92	5418.71	0.014090	7.50	60.95	41.52	1.09			7.50	2.58
75.752*	457.0	5415.13	5417.69	5417.77	5418.55	0.014183	7.46	61.28	42.33	1.09			7.46	2.56
75.6359*	457.0	5415.02	5417.78	5417.63	5418.41	0.008735	6.37	72.41	48.16	0.88	0.95		6.31	2.76
75.52	457.0	5414.90	5417.80	5417.50	5418.28	0.005967	5.64	88.28	59.29	0.74	1.92		5.18	2.90
75.3466*	457.0	5414.74	5417.67	5417.38	5418.17	0.006072	5.74	86.81	58.91	0.74	1.83		5.26	2.93
75.1733*	457.0	5414.57	5417.52	5417.27	5418.05	0.006449	5.92	84.08	58.44	0.77	1.74		5.44	2.95
75	457.0	5414.41	5417.27	5417.17	5417.92	0.008342	6.52	75.45	55.82	0.86	1.69		6.06	2.86
74.8*	457.0	5414.21	5417.15	5416.95	5417.75	0.007379	6.28	77.44	52.33	0.82	1.72		5.90	2.94
74.6*	457.0	5414.01	5417.07	5416.74	5417.59	0.006032	5.88	82.35	51.20	0.75	1.72		5.55	3.06
74.4	457.0	5413.81	5417.01	5416.57	5417.46	0.004841	5.48	88.35	50.91	0.68	1.70		5.17	3.20
74.2*	457.0	5413.62	5416.95	5416.37	5417.36	0.004249	5.09	89.78	44.28	0.63			5.09	3.33
74	457.0	5413.43	5416.92	5416.17	5417.26	0.003417	4.73	96.61	45.14	0.57			4.73	3.48
73.9166*	457.0	5413.34	5416.91	5416.08	5417.23	0.003035	4.54	100.76	45.88	0.54			4.54	3.57
73.8333*	457.0	5413.26	5416.90	5416.00	5417.20	0.002726	4.36	104.73	46.62	0.51			4.36	3.64
73.75	457.0	5413.17	5416.90	5415.88	5417.17	0.002430	4.19	109.10	75.35	0.49			4.19	3.72
73.5	457.0	5412.92	5416.87	5415.67	5417.10	0.001919	3.88	117.80	69.79	0.44			3.88	3.95
73.375*	457.0	5412.80	5416.85	5415.59	5417.07	0.001750	3.76	122.15	59.36	0.42		0.46	3.74	4.05
73.25	457.0	5412.68	5416.87	5415.41	5417.04	0.001164	3.42	148.29	65.15	0.35	0.68	1.34	3.08	4.19
73	457.0	5412.44	5416.85	5415.17	5417.01	0.001001	3.25	151.00	60.60	0.33	0.97		3.03	4.41
72.77	457.0	5412.20	5416.86	5414.94	5416.98	0.000812	2.75	168.74	68.14	0.29	0.49		2.71	4.66
72.615*	457.0	5412.05	5416.86	5414.66	5416.96	0.000640	2.55	179.12	60.28	0.26			2.55	4.81
72.46	457.0	5411.90	5416.86	5414.40	5416.95	0.000475	2.34	195.63	65.69	0.23			2.34	4.96
72.23	457.0	5411.77	5416.75	5414.96	5416.92	0.001661	3.32	137.85	63.36	0.40			3.32	4.98
72.1150*	457.0	5411.79	5416.58	5415.46	5416.88	0.002844	4.46	102.53	45.17	0.52			4.46	4.79
72	457.0	5411.82	5415.93	5415.79	5416.78	0.009146	7.40	61.77	29.98	0.91			7.40	4.11
71.78	457.0	5411.71	5415.79	5415.79	5416.52	0.011812	6.83	66.93	45.47	0.99			6.83	4.08
71.6866*	457.0	5411.68	5415.42	5415.63	5416.36	0.018116	7.78	58.75	45.39	1.20			7.78	3.74
71.5933*	457.0	5411.66	5415.40	5415.47	5416.14	0.014399	6.90	66.22	51.54	1.07			6.90	3.74
71.5	457.0	5411.63	5415.20	5415.32	5415.99	0.017335	7.13	64.08	54.15	1.16			7.13	3.57
71.375*	457.0	5411.47	5414.52	5414.81	5415.68	0.026235	8.64	52.88	46.11	1.42			8.64	3.05
71.25*	457.0	5411.31	5414.04	5414.38	5415.34	0.026181	9.16	49.90	40.08	1.45			9.16	2.73
71.125*	457.0	5411.15	5413.65	5414.00	5415.02	0.024194	9.40	48.61	35.36	1.41			9.40	2.50

Profile Output Table - No Name Arroyo Reconstructed Channel 25yr-6hr
 HEC-RAS Plan: Postmine River: No Name Reach: Reach 1 Profile: PF 3

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Vel Lt (ft/s)	Vel Rt (ft/s)	Vel Total (ft/s)	Max Chnl Depth (ft)
71	457.0	5410.99	5413.43	5413.70	5414.72	0.018388	9.14	50.00	30.10	1.25			9.14	2.43
70.875*	457.0	5410.89	5413.69	5413.69	5414.53	0.011113	7.35	62.56	39.50	0.99	1.00		7.31	2.80
70.75	457.0	5410.79	5413.39	5413.52	5414.36	0.014826	7.92	58.39	41.38	1.13	1.45		7.83	2.59
70.6166*	457.0	5410.69	5413.28	5413.37	5414.17	0.014286	7.57	60.35	41.00	1.10			7.57	2.59
70.4833*	457.0	5410.58	5413.51	5413.18	5413.98	0.006357	5.45	83.89	50.97	0.75			5.45	2.93
70.35	457.0	5410.48	5413.60	5412.80	5413.85	0.002565	4.00	116.45	60.24	0.49		1.20	3.92	3.12
70.175*	457.0	5410.35	5413.47	5412.88	5413.79	0.003964	4.56	100.11	55.78	0.60			4.56	3.12
70	457.0	5410.22	5413.40	5412.80	5413.72	0.003884	4.54	100.76	55.69	0.59			4.54	3.18
69.75*	457.0	5410.04	5413.25	5412.67	5413.61	0.004248	4.82	94.96	52.74	0.62	0.40		4.81	3.21
69.5	457.0	5409.85	5413.02	5412.57	5413.49	0.005220	5.55	85.46	49.42	0.70	1.53		5.35	3.16
69.3333*	457.0	5409.72	5412.95	5412.44	5413.39	0.005019	5.32	88.19	52.36	0.68	1.24		5.18	3.23
69.1666*	457.0	5409.59	5412.90	5412.32	5413.30	0.004582	5.07	91.59	53.90	0.65	0.92		4.99	3.31
69	457.0	5409.46	5412.84	5412.20	5413.22	0.003975	4.93	93.20	50.19	0.61	0.51		4.90	3.38
68.75*	457.0	5409.27	5412.78	5412.02	5413.11	0.003644	4.67	97.87	59.51	0.58			4.67	3.51
68.5	457.0	5409.08	5412.72	5411.81	5413.02	0.002990	4.43	103.25	62.18	0.53			4.43	3.64
68.375*	457.0	5408.98	5412.70	5411.71	5412.98	0.002737	4.26	107.27	66.37	0.51			4.26	3.72
68.25	457.0	5408.88	5412.68	5411.64	5412.94	0.002429	4.11	111.25	69.09	0.48			4.11	3.80
68.13	457.0	5408.78	5412.75	5411.43	5412.88	0.001015	3.00	173.00	70.27	0.32	1.64		2.64	3.97
67.99	457.0	5408.64	5412.77	5410.70	5412.86	0.000605	2.42	189.31	71.95	0.25	0.16		2.41	4.13
67.89*	457.0	5408.58	5412.75	5410.90	5412.85	0.000724	2.57	178.13	65.66	0.27			2.57	4.17
67.79	457.0	5408.51	5412.73	5410.99	5412.84	0.000794	2.63	174.00	66.25	0.29			2.63	4.22
67.65	457.0	5408.41	5412.66	5411.10	5412.82	0.001279	3.26	140.10	54.86	0.36			3.26	4.24
67.4	457.0	5408.21	5412.63	5410.98	5412.79	0.001209	3.25	140.61	52.87	0.35			3.25	4.41
67.2*	457.0	5407.99	5412.54	5411.06	5412.76	0.001594	3.71	123.35	46.78	0.40			3.71	4.55
67	457.0	5407.77	5412.32	5411.43	5412.70	0.003311	4.96	92.15	38.68	0.57			4.96	4.55
66.75*	457.0	5407.70	5412.22	5411.35	5412.62	0.003351	5.04	90.61	37.61	0.57			5.04	4.52
66.5	457.0	5407.63	5412.10	5411.24	5412.53	0.003636	5.25	86.99	36.06	0.60			5.25	4.47
66.255*	457.0	5407.58	5411.89	5411.24	5412.42	0.004661	5.82	78.50	33.41	0.67			5.82	4.31
66.01	457.0	5407.52	5411.62	5411.20	5412.27	0.006295	6.48	70.50	30.69	0.75			6.48	4.10
65.84*	457.0	5407.39	5411.14	5411.10	5412.11	0.010691	7.90	57.85	28.79	0.98			7.90	3.75
65.67*	457.0	5407.25	5410.99	5410.89	5411.92	0.009782	7.75	58.94	28.53	0.95			7.75	3.74
65.5	457.0	5407.12	5411.01	5410.66	5411.71	0.006584	6.72	67.96	30.09	0.79			6.72	3.89
65.25*	457.0	5406.85	5410.96	5410.47	5411.51	0.005446	5.98	76.42	35.25	0.72			5.98	4.11
65	457.0	5406.58	5410.55	5410.47	5411.31	0.009991	7.03	65.04	37.01	0.93			7.03	3.97
64.8*	457.0	5406.58	5410.42	5410.17	5411.11	0.007870	6.69	68.33	35.27	0.85			6.69	3.83
64.6*	457.0	5406.58	5410.29	5409.98	5410.95	0.007025	6.51	70.16	34.67	0.81			6.51	3.71
64.4	457.0	5406.58	5410.13	5409.81	5410.81	0.007324	6.63	68.96	34.14	0.82			6.63	3.54
64.175*	457.0	5406.38	5410.19	5409.62	5410.59	0.004568	5.06	90.35	47.46	0.65			5.06	3.81
63.95	457.0	5406.17	5410.23	5409.39	5410.45	0.002571	3.75	121.93	64.93	0.48			3.75	4.06
63.7633*	457.0	5405.99	5410.13	5409.40	5410.39	0.003114	4.10	111.43	60.29	0.53			4.10	4.14
63.5766*	457.0	5405.81	5410.02	5409.33	5410.33	0.003654	4.45	102.77	55.84	0.58			4.45	4.21
63.39	457.0	5405.63	5409.90	5409.30	5410.25	0.004031	4.74	96.43	51.30	0.61			4.74	4.27
63.2066*	457.0	5405.46	5409.88	5409.03	5410.17	0.002956	4.28	106.88	52.54	0.53			4.28	4.42
63.0233*	457.0	5405.30	5409.88	5408.69	5410.10	0.001966	3.78	120.75	52.31	0.44			3.78	4.58
62.84	457.0	5405.13	5409.88	5408.30	5410.06	0.001287	3.35	136.37	51.20	0.36			3.35	4.75
62.6	457.0	5405.13	5409.89	5408.06	5410.02	0.000913	2.94	155.67	55.28	0.31			2.94	4.76
62.475*	457.0	5405.13	5409.78	5408.44	5410.00	0.001658	3.72	122.75	47.73	0.41			3.72	4.65
62.35	457.0	5405.13	5409.54	5408.60	5409.95	0.003346	5.12	89.33	35.53	0.57			5.12	4.41
62.175*	457.0	5405.10	5409.46	5408.72	5409.89	0.003946	5.21	87.74	39.23	0.61			5.21	4.36
62	457.0	5405.08	5409.36	5408.77	5409.81	0.004648	5.38	84.99	41.01	0.66			5.38	4.28
61.75*	457.0	5405.03	5409.00	5408.69	5409.65	0.007277	6.47	70.66	36.28	0.82			6.47	3.97
61.5	457.0	5404.98	5408.82	5408.40	5409.48	0.006571	6.50	70.34	32.92	0.78			6.50	3.84
61.25*	457.0	5404.82	5408.75	5408.26	5409.29	0.005509	5.88	77.66	37.41	0.72			5.88	3.93
61	457.0	5404.66	5408.78	5407.95	5409.12	0.003305	4.69	97.51	45.26	0.56			4.69	4.12
60.75*	457.0	5404.53	5408.74	5407.65	5409.03	0.002501	4.34	105.33	44.49	0.50			4.34	4.21
60.5	457.0	5404.39	5408.69	5407.48	5408.97	0.002163	4.25	108.32	49.88	0.47	0.31		4.22	4.30
60.25*	457.0	5404.26	5408.53	5407.54	5408.90	0.003054	4.89	93.49	38.06	0.55			4.89	4.27
60	457.0	5404.13	5408.25	5407.59	5408.79	0.004701	5.89	77.62	32.83	0.67			5.89	4.12
59.75*	457.0	5404.00	5408.19	5407.41	5408.66	0.004195	5.51	82.93	35.63	0.64			5.51	4.19
59.5	457.0	5403.88	5408.04	5407.34	5408.55	0.004807	5.69	80.26	36.07	0.67			5.69	4.16
59.25*	457.0	5403.84	5407.92	5407.31	5408.43	0.004944	5.72	79.84	36.84	0.69			5.72	4.08
59	457.0	5403.80	5407.81	5407.24	5408.29	0.004827	5.58	81.91	38.47	0.67			5.58	4.01
58.82*	457.0	5403.67	5407.76	5407.06	5408.20	0.004137	5.36	85.19	39.40	0.63			5.36	4.09
58.64*	457.0	5403.54	5407.70	5406.90	5408.13	0.003733	5.23	87.32	46.20	0.60			5.23	4.16
58.46	457.0	5403.41	5407.64	5406.69	5408.06	0.003575	5.19	88.09	49.19	0.59			5.19	4.23
58.23*	457.0	5403.30	5407.56	5406.62	5407.97	0.003623	5.18	88.21	54.80	0.59			5.18	4.26
58	457.0	5403.19	5407.45	5406.60	5407.89	0.003876	5.29	86.32	56.74	0.61			5.29	4.26
57.8825*	457.0	5403.17	5407.42	5406.53	5407.83	0.003563	5.20	87.91	83.25	0.59			5.20	4.25
57.765*	457.0	5403.16	5407.38	5406.48	5407.79	0.003364	5.16	88.59	110.62	0.58			5.16	4.22
57.6475*	457.0	5403.14	5407.34	5406.41	5407.75	0.003287	5.17	88.33	118.92	0.57			5.17	4.20
57.53	457.0	5403.12	5407.52	5406.38	5407.64	0.001155	3.21	220.61	145.51	0.34	1.21		2.07	4.40

Profile Output Table - No Name Arroyo Reconstructed Channel 25yr-6hr
 HEC-RAS Plan: Postmine River: No Name Reach: Reach 1 Profile: PF 3

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Vel Lt (ft/s)	Vel Rt (ft/s)	Vel Total (ft/s)	Max Chnl Depth (ft)
57.38	457.0	5403.07	5407.47	5406.17	5407.62	0.001078	3.65	183.12	100.62	0.35	1.66	1.39	2.50	4.40
57.23	457.0	5403.06	5407.35	5405.91	5407.59	0.001509	3.93	122.19	57.27	0.40	0.20	1.27	3.74	4.29
57	457.0	5403.03	5407.05	5406.21	5407.52	0.003926	5.47	83.60	39.72	0.62			5.47	4.02
56.75*	457.0	5402.90	5406.88	5406.20	5407.41	0.004516	5.79	78.93	33.25	0.66			5.79	3.98
56.5	457.0	5402.77	5406.68	5406.12	5407.28	0.005088	6.22	73.53	62.00	0.70	0.13	0.40	6.22	3.91
56.375*	457.0	5402.67	5406.58	5406.09	5407.21	0.005307	6.40	72.29	73.70	0.72	0.51	0.80	6.32	3.90
56.25*	457.0	5402.58	5406.48	5406.04	5407.14	0.005464	6.54	73.03	92.53	0.73	0.81	1.12	6.26	3.90
56.125*	457.0	5402.48	5406.48	5405.98	5407.05	0.004626	6.22	94.53	119.36	0.68	0.91	1.29	4.83	4.00
56	457.0	5402.38	5406.50	5406.06	5406.97	0.003707	5.76	117.37	145.59	0.61	1.06	1.31	3.89	4.12
55.875*	457.0	5402.38	5406.53	5406.22	5406.90	0.002982	5.29	140.20	163.06	0.55	1.13	1.21	3.26	4.15
55.75*	457.0	5402.38	5406.56	5405.88	5406.83	0.002314	4.77	164.87	167.28	0.49	1.19	1.09	2.77	4.18
55.625*	457.0	5402.38	5406.57	5405.82	5406.79	0.001884	4.38	187.44	175.22	0.44	1.20	1.01	2.44	4.19
55.5	457.0	5402.38	5406.58	5405.77	5406.75	0.001547	4.02	211.17	185.08	0.40	1.18	0.93	2.16	4.20
55.375*	457.0	5402.38	5405.87	5405.61	5406.66	0.006884	7.14	65.62	139.36	0.81	0.81	1.30	6.96	3.49
55.25*	457.0	5402.38	5405.91	5405.47	5406.54	0.005374	6.37	73.58	157.42	0.72	0.78	1.21	6.21	3.53
55.125*	457.0	5402.38	5405.92	5405.34	5406.44	0.004450	5.81	80.67	173.74	0.66	0.75	1.12	5.66	3.54
55	457.0	5402.38	5405.92	5405.26	5406.37	0.003805	5.36	87.31	192.21	0.61	0.71	1.05	5.23	3.54
54.875*	457.0	5402.38	5406.12	5405.28	5406.24	0.001320	3.33	233.85	205.05	0.37	1.08	0.66	1.95	3.74
54.75*	457.0	5402.38	5405.26	5405.26	5406.13	0.011024	7.48	61.06	134.92	0.99			7.48	2.88
54.625*	457.0	5402.37	5405.27	5405.27	5406.13	0.010829	7.46	61.29	145.27	0.99	0.16		7.46	2.90
54.5	457.0	5402.37	5405.32	5405.32	5405.72	0.006056	5.70	125.26	164.13	0.74	1.57		3.65	2.95
54.25*	457.0	5402.29	5405.05	5405.12	5405.55	0.007561	6.32	112.98	148.18	0.83	1.77		4.04	2.76
54	457.0	5402.20	5404.91	5404.95	5405.36	0.007130	6.25	120.81	155.13	0.80	1.91	0.59	3.78	2.71
53.8233*	457.0	5402.10	5404.60	5404.75	5405.19	0.011204	7.03	104.81	159.21	0.98	2.06	0.69	4.36	2.50
53.6466*	457.0	5402.01	5404.60	5404.58	5404.92	0.006684	5.48	141.48	189.49	0.76	1.87	1.24	3.23	2.59
53.47	457.0	5401.91	5404.61	5404.38	5404.78	0.003901	4.22	186.23	217.69	0.59	1.65	1.38	2.45	2.70
Max							9.14							
Min							2.34							
Avg							5.53							
													Avg	5.47

Only the reconstructed channel reaches were included in determining the maximum, minimum, and average velocities. The reconstructed reaches are from Station 81.50 to 72.23 and from Station 71.00 to 67.00.

Profile Output Table - No Name Arroyo Reconstructed Channel 100yr-6hr
 HEC-RAS Plan: Postmine River: No Name Reach: Reach 1 Profile: PF 4

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Vel Lt (ft/s)	Vel Rt (ft/s)	Vel Total (ft/s)	Max Chnl Depth (ft)
92	824.0	5430.37	5437.80	5432.63	5437.84	0.000110	1.62	594.21	213.67	0.12	0.26	0.32	1.39	7.43
91.8925*	824.0	5430.22	5437.78	5432.98	5437.84	0.000174	1.97	488.32	199.23	0.15	0.33	0.34	1.69	7.56
91.785*	824.0	5430.07	5437.74	5433.39	5437.83	0.000297	2.46	383.04	179.35	0.19	0.44	0.33	2.15	7.67
91.6775*	824.0	5429.92	5437.66	5433.87	5437.82	0.000551	3.22	268.24	135.33	0.26	0.59		3.07	7.74
91.57	824.0	5429.77	5437.50	5434.40	5437.80	0.001162	4.44	195.47	59.20	0.36	0.80		4.22	7.73
91.465*	824.0	5429.59	5437.39	5434.93	5437.78	0.001574	5.06	175.12	74.45	0.42	1.02		4.71	7.80
91.36*	824.0	5429.42	5437.23	5435.34	5437.74	0.002212	5.86	154.71	98.87	0.49	1.30		5.33	7.80
91.255*	824.0	5429.25	5436.98	5435.70	5437.70	0.003275	6.92	133.12	95.45	0.59	1.82		6.19	7.73
91.15	824.0	5429.07	5436.02	5436.02	5437.57	0.008586	10.09	88.35	45.95	0.91	2.35		9.33	6.95
91.0533*	824.0	5428.81	5434.14	5435.16	5437.24	0.026568	14.12	58.34	26.41	1.56			14.12	5.33
90.9566*	824.0	5428.55	5433.38	5434.54	5436.89	0.035780	15.03	54.84	28.11	1.79			15.03	4.83
90.86	824.0	5428.29	5432.86	5434.05	5436.49	0.042763	15.28	53.93	35.85	1.93			15.28	4.57
90.6	824.0	5427.43	5432.16	5433.26	5435.49	0.029108	14.66	56.22	42.15	1.64			14.66	4.72
90.45*	824.0	5426.88	5431.03	5432.30	5434.93	0.038282	15.85	51.98	39.16	1.87			15.85	4.15
90.3	824.0	5426.33	5429.95	5431.32	5434.27	0.045490	16.68	49.40	23.42	2.02			16.68	3.61
90.2*	824.0	5426.29	5429.10	5430.44	5433.70	0.064141	17.20	47.91	29.01	2.36			17.20	2.81
90.1*	824.0	5426.25	5428.50	5429.75	5432.94	0.078192	16.91	48.73	35.54	2.55			16.91	2.25
90	824.0	5426.21	5428.03	5429.09	5432.00	0.082525	15.99	51.54	42.78	2.57			15.99	1.82
89.875*	824.0	5425.98	5428.14	5429.01	5430.89	0.044033	13.30	61.96	42.33	1.94			13.30	2.16
89.75*	824.0	5425.75	5428.32	5428.86	5430.23	0.024154	11.10	74.24	42.31	1.48			11.10	2.57
89.625*	824.0	5425.52	5429.14	5428.76	5429.95	0.006598	7.22	114.15	46.49	0.81			7.22	3.62
89.5	824.0	5425.29	5428.91	5428.67	5429.84	0.007743	7.73	106.54	43.87	0.87			7.73	3.62
89.4166*	824.0	5425.08	5428.98	5428.50	5429.74	0.005791	6.98	118.05	45.55	0.76			6.98	3.90
89.3333*	824.0	5424.87	5429.02	5428.30	5429.66	0.004348	6.40	128.74	45.47	0.67			6.40	4.15
89.25	824.0	5424.66	5429.04	5428.06	5429.60	0.003431	6.02	136.94	44.06	0.60			6.02	4.38
89.125*	824.0	5424.40	5429.19	5427.70	5429.49	0.001784	4.36	189.18	61.76	0.44			4.36	4.79
89	824.0	5424.13	5429.24	5427.46	5429.44	0.001320	3.58	230.16	80.83	0.37			3.58	5.11
88.8266*	824.0	5423.95	5429.24	5427.60	5429.41	0.001229	3.34	246.97	91.88	0.36			3.34	5.29
88.6533*	824.0	5423.77	5429.23	5427.70	5429.38	0.001184	3.17	260.29	101.91	0.35			3.17	5.46
88.48	824.0	5423.59	5429.22	5427.64	5429.36	0.001201	3.06	268.97	111.60	0.35			3.06	5.62
88.2400*	824.0	5423.60	5429.10	5427.49	5429.32	0.001371	3.75	219.56	73.94	0.38			3.75	5.50
88	824.0	5423.60	5428.70	5427.51	5429.24	0.002999	5.92	139.11	41.03	0.57			5.92	5.10
87.875*	824.0	5423.66	5428.59	5427.57	5429.20	0.003516	6.25	131.80	40.62	0.61			6.25	4.93
87.75*	824.0	5423.72	5428.46	5427.62	5429.14	0.004206	6.64	124.07	40.11	0.67			6.64	4.74
87.625*	824.0	5423.78	5428.28	5427.65	5429.07	0.005197	7.14	115.48	39.40	0.73			7.14	4.50
87.5	824.0	5423.84	5427.68	5427.68	5428.94	0.010282	9.02	91.37	36.75	1.01			9.02	3.83
87.3333*	824.0	5423.84	5427.29	5427.46	5428.73	0.012724	9.63	85.53	36.74	1.11			9.63	3.45
87.1666*	824.0	5423.84	5427.08	5427.26	5428.53	0.012984	9.65	85.36	37.11	1.12			9.65	3.24
87	824.0	5423.84	5426.90	5427.08	5428.34	0.013033	9.62	85.65	37.38	1.12			9.62	3.06
86.74	824.0	5423.82	5427.11	5426.90	5428.05	0.007913	7.77	106.00	43.83	0.88			7.77	3.29
86.62*	824.0	5423.73	5427.33	5426.80	5427.85	0.004876	5.78	142.68	64.75	0.69			5.78	3.60
86.5	824.0	5423.64	5427.34	5426.86	5427.76	0.005158	5.17	159.47	89.45	0.68			5.17	3.70
86.3849*	824.0	5423.55	5427.33	5426.44	5427.69	0.002969	4.83	170.58	69.49	0.54			4.83	3.78
86.27	824.0	5423.47	5427.11	5426.23	5427.64	0.003517	5.84	141.13	65.74	0.60			5.84	3.64
86.1349*	824.0	5423.31	5426.94	5426.28	5427.58	0.004505	6.39	128.90	46.32	0.68			6.39	3.63
86	824.0	5423.15	5426.57	5426.31	5427.47	0.007431	7.61	108.33	43.75	0.85			7.61	3.42
85.8*	824.0	5422.90	5426.55	5426.05	5427.29	0.005584	6.90	119.38	45.24	0.75			6.90	3.65
85.6	824.0	5422.64	5426.54	5425.82	5427.15	0.004324	6.29	130.92	46.97	0.66			6.29	3.90
85.35*	824.0	5422.58	5426.41	5425.73	5427.04	0.004525	6.41	128.52	46.56	0.68			6.41	3.83
85.1*	824.0	5422.52	5426.25	5425.63	5426.93	0.004852	6.59	125.11	45.89	0.70			6.59	3.73
84.85	824.0	5422.46	5426.09	5425.52	5426.80	0.005220	6.78	121.57	45.07	0.73			6.78	3.63
84.6833*	824.0	5422.36	5426.08	5425.49	5426.68	0.004750	6.22	132.50	52.75	0.69			6.22	3.72
84.5166*	824.0	5422.27	5426.04	5425.55	5426.58	0.004979	5.92	139.30	62.41	0.70			5.92	3.77
84.35	824.0	5422.17	5425.98	5425.49	5426.49	0.005043	5.73	143.72	82.91	0.69			5.73	3.81
84.2333*	824.0	5422.17	5426.11	5425.07	5426.37	0.002217	4.12	200.14	84.33	0.47			4.12	3.94
84.1166*	824.0	5422.17	5426.15	5424.96	5426.33	0.001534	3.43	240.02	100.97	0.39			3.43	3.97
84	824.0	5422.17	5426.13	5424.74	5426.31	0.001361	3.45	238.51	115.24	0.38			3.45	3.95
83.75	824.0	5422.39	5426.09	5424.85	5426.28	0.001448	3.49	236.36	189.95	0.39			3.49	3.70
83.625*	824.0	5422.08	5426.15	5424.12	5426.23	0.000481	2.21	372.14	127.20	0.23			2.21	4.07
83.5	824.0	5421.77	5426.18	5423.49	5426.21	0.000169	1.45	566.79	165.97	0.14			1.45	4.41
83.3849*	824.0	5421.42	5426.12	5423.69	5426.21	0.000423	2.29	360.21	105.78	0.22			2.29	4.70
83.27	824.0	5421.08	5425.68	5424.45	5426.16	0.002718	5.56	148.32	45.29	0.54			5.56	4.60
83	824.0	5420.96	5425.62	5424.41	5426.08	0.002659	5.40	152.59	47.73	0.53			5.40	4.66
82.8825*	824.0	5420.96	5425.74	5424.05	5425.99	0.001416	4.07	202.31	61.17	0.39			4.07	4.78
82.765*	824.0	5420.96	5425.78	5423.87	5425.95	0.000955	3.36	245.25	74.10	0.33			3.36	4.82
82.6475*	824.0	5420.97	5425.80	5423.76	5425.93	0.000730	2.91	282.69	86.72	0.28			2.91	4.83
82.53	824.0	5420.97	5425.81	5423.58	5425.92	0.000606	2.61	315.16	98.98	0.26			2.61	4.84
82.3999*	824.0	5420.95	5425.74	5423.58	5425.90	0.000819	3.22	256.16	73.44	0.30			3.22	4.79
82.27	824.0	5420.93	5425.49	5423.94	5425.86	0.001967	4.91	167.84	47.55	0.46			4.91	4.56
82.1349*	824.0	5421.01	5425.31	5424.18	5425.82	0.002974	5.73	143.85	44.37	0.56			5.73	4.30
82	824.0	5421.09	5424.89	5424.43	5425.73	0.006076	7.37	111.75	40.59	0.78			7.37	3.80

Profile Output Table - No Name Arroyo Reconstructed Channel 100yr-6hr
 HEC-RAS Plan: Postmine River: No Name Reach: Reach 1 Profile: PF 4

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Vel Lt (ft/s)	Vel Rt (ft/s)	Vel Total (ft/s)	Max Chnl Depth (ft)
81.875*	824.0	5421.00	5424.82	5424.40	5425.65	0.006260	7.30	112.89	43.03	0.79			7.30	3.82
81.75*	824.0	5420.92	5424.73	5424.38	5425.56	0.006681	7.32	112.51	45.06	0.82			7.32	3.81
81.625*	824.0	5420.83	5424.62	5424.33	5425.48	0.007257	7.44	110.82	46.21	0.85			7.44	3.79
81.5	824.0	5420.75	5424.29	5424.29	5425.36	0.010178	8.29	99.34	45.34	0.99			8.29	3.54
81.25	824.0	5420.52	5423.67	5423.93	5425.00	0.016424	9.27	88.88	122.70	1.22			9.27	3.15
81.125*	824.0	5420.39	5424.34	5423.71	5424.82	0.004307	5.58	147.64	64.76	0.65			5.58	3.95
81	824.0	5420.26	5424.44	5423.37	5424.72	0.002297	4.29	191.95	77.85	0.48			4.29	4.17
80.875*	824.0	5420.13	5424.27	5423.34	5424.68	0.003183	5.11	161.29	64.26	0.57			5.11	4.14
80.75	824.0	5420.01	5424.02	5423.34	5424.61	0.004535	6.17	133.62	51.91	0.68			6.17	4.01
80.5	824.0	5419.78	5423.37	5423.35	5424.41	0.009776	8.18	100.76	45.53	0.97			8.18	3.59
80.25*	824.0	5419.54	5423.13	5423.09	5424.17	0.009733	8.16	100.93	45.56	0.97			8.16	3.59
80	824.0	5419.29	5422.88	5422.84	5423.92	0.009791	8.18	100.70	45.51	0.97			8.18	3.59
79.775*	824.0	5419.07	5422.66	5422.63	5423.70	0.009824	8.19	100.65	45.58	0.97			8.19	3.59
79.55	824.0	5418.85	5422.44	5422.42	5423.48	0.009885	8.20	100.52	45.64	0.97			8.20	3.59
79.465*	824.0	5418.77	5422.36	5422.33	5423.39	0.009796	8.16	100.92	45.79	0.97			8.16	3.59
79.38*	824.0	5418.69	5422.28	5422.22	5423.30	0.009598	8.10	101.70	45.98	0.96			8.10	3.59
79.295*	824.0	5418.60	5422.21	5422.14	5423.21	0.009402	8.04	102.50	46.18	0.95			8.04	3.61
79.21*	824.0	5418.52	5422.14	5422.06	5423.13	0.009229	7.98	103.25	46.38	0.94			7.98	3.62
79.125*	824.0	5418.44	5422.07	5421.95	5423.04	0.008911	7.88	104.56	46.63	0.93			7.88	3.63
79.04	824.0	5418.36	5422.01	5421.87	5422.95	0.008665	7.80	105.66	46.87	0.92			7.80	3.65
78.77	824.0	5418.10	5421.74	5421.65	5422.72	0.009024	7.95	103.70	46.08	0.93			7.95	3.64
78.5	824.0	5417.83	5421.51	5421.39	5422.46	0.008865	7.82	105.32	47.31	0.92			7.82	3.68
78.375*	824.0	5417.71	5421.39	5421.26	5422.35	0.009032	7.88	104.63	47.25	0.93			7.88	3.68
78.25*	824.0	5417.58	5421.25	5421.13	5422.23	0.009182	7.93	103.89	47.01	0.94			7.93	3.67
78.125*	824.0	5417.46	5421.14	5421.02	5422.11	0.009054	7.90	104.24	46.88	0.93			7.90	3.68
78	824.0	5417.34	5420.89	5420.87	5421.97	0.010085	8.34	99.45	49.43	0.99	0.94		8.29	3.55
77.7966*	824.0	5417.14	5420.72	5420.72	5421.75	0.009380	8.21	104.77	57.75	0.96		1.70	7.87	3.58
77.5933*	824.0	5416.94	5420.71	5420.51	5421.51	0.006734	7.35	126.05	69.06	0.82		2.25	6.54	3.77
77.39	824.0	5416.74	5420.77	5420.24	5421.32	0.004294	6.26	160.23	82.63	0.67		2.33	5.14	4.03
77.2666*	824.0	5416.62	5420.50	5420.21	5421.23	0.005901	7.06	130.62	67.75	0.77		2.19	6.31	3.88
77.1433*	824.0	5416.50	5420.22	5420.06	5421.14	0.007722	7.72	111.28	57.06	0.87		1.65	7.40	3.72
77.02*	824.0	5416.38	5420.05	5419.91	5421.02	0.008577	7.91	104.82	49.09	0.92		0.98	7.86	3.67
76.8966*	824.0	5416.26	5419.95	5419.80	5420.91	0.008699	7.88	104.62	45.81	0.92			7.88	3.69
76.7733*	824.0	5416.14	5419.83	5419.67	5420.79	0.008612	7.86	104.82	45.66	0.91			7.86	3.69
76.65	824.0	5416.02	5419.63	5419.55	5420.67	0.009649	8.18	100.71	44.97	0.96			8.18	3.61
76.4666*	824.0	5415.84	5419.47	5419.37	5420.48	0.009339	8.07	102.11	45.45	0.95			8.07	3.63
76.2833*	824.0	5415.66	5419.31	5419.19	5420.30	0.009110	7.99	103.09	45.70	0.94			7.99	3.65
76.1	824.0	5415.48	5419.04	5419.04	5420.11	0.010169	8.29	99.42	45.98	0.99			8.29	3.56
75.984*	824.0	5415.36	5418.70	5418.85	5419.96	0.013236	9.00	91.53	45.03	1.11			9.00	3.34
75.868*	824.0	5415.25	5418.59	5418.69	5419.78	0.012490	8.77	93.98	46.10	1.08			8.77	3.34
75.752*	824.0	5415.13	5418.50	5418.54	5419.61	0.011250	8.44	97.73	48.51	1.03	0.51		8.43	3.37
75.6359*	824.0	5415.02	5418.23	5418.41	5419.45	0.012884	8.91	95.68	55.55	1.10		2.01	8.61	3.21
75.52	824.0	5414.90	5418.64	5418.22	5419.26	0.005275	6.59	143.20	72.28	0.73		2.52	5.75	3.74
75.3466*	824.0	5414.74	5418.55	5418.14	5419.17	0.005088	6.56	145.32	74.00	0.72		2.43	5.67	3.81
75.1733*	824.0	5414.57	5418.48	5418.03	5419.08	0.004839	6.50	149.05	77.11	0.70		2.33	5.53	3.91
75	824.0	5414.41	5418.42	5417.94	5419.00	0.004575	6.42	154.59	82.71	0.69		2.22	5.33	4.01
74.8*	824.0	5414.21	5418.34	5417.75	5418.91	0.004184	6.29	151.97	72.85	0.66		2.23	5.42	4.13
74.6*	824.0	5414.01	5418.29	5417.54	5418.82	0.003626	6.02	155.49	68.19	0.62		2.19	5.30	4.28
74.4	824.0	5413.81	5418.26	5417.37	5418.74	0.003103	5.73	161.35	65.71	0.58		2.14	5.11	4.45
74.2*	824.0	5413.62	5418.20	5417.16	5418.67	0.003023	5.50	150.52	55.19	0.56		0.59	5.47	4.58
74	824.0	5413.43	5418.18	5416.97	5418.60	0.002653	5.19	158.76	112.87	0.53			5.19	4.75
73.9166*	824.0	5413.34	5418.18	5416.88	5418.57	0.002442	5.01	164.46	70.26	0.51			5.01	4.84
73.8333*	824.0	5413.26	5418.18	5416.78	5418.54	0.002230	4.85	169.75	94.05	0.49			4.85	4.92
73.75	824.0	5413.17	5418.18	5416.69	5418.52	0.002023	4.71	174.84	97.69	0.47			4.71	5.01
73.5	824.0	5412.92	5418.15	5416.48	5418.46	0.001714	4.46	184.80	84.89	0.43		0.30	4.46	5.23
73.375*	824.0	5412.80	5418.17	5416.38	5418.43	0.001277	4.18	223.49	90.38	0.38	0.62	1.20	3.69	5.37
73.25	824.0	5412.68	5418.18	5416.23	5418.41	0.000988	4.02	242.63	79.18	0.34	1.12	1.79	3.40	5.50
73	824.0	5412.44	5418.16	5415.96	5418.38	0.000953	3.92	239.77	76.08	0.33	1.35	0.17	3.44	5.72
72.77	824.0	5412.20	5418.18	5415.80	5418.34	0.000711	3.27	270.15	88.88	0.29	0.90		3.05	5.98
72.615*	824.0	5412.05	5418.18	5415.45	5418.33	0.000647	3.12	269.37	79.38	0.28	0.49		3.06	6.13
72.46	824.0	5411.90	5418.18	5415.13	5418.32	0.000556	2.94	280.00	81.94	0.26			2.94	6.28
72.23	824.0	5411.77	5418.09	5416.11	5418.29	0.001183	3.57	230.86	73.49	0.35			3.57	6.32
72.1150*	824.0	5411.79	5417.89	5416.47	5418.26	0.002377	4.88	168.98	56.79	0.50			4.88	6.10
72	824.0	5411.82	5416.79	5416.79	5418.12	0.010278	9.25	89.05	33.44	1.00			9.25	4.97
71.78	824.0	5411.71	5416.06	5416.54	5417.72	0.023163	10.34	79.72	48.20	1.42			10.34	4.35
71.6866*	824.0	5411.68	5415.86	5416.31	5417.50	0.024238	10.27	80.21	50.81	1.44			10.27	4.18
71.5933*	824.0	5411.66	5415.74	5416.14	5417.23	0.022262	9.81	84.02	53.42	1.38			9.81	4.08
71.5	824.0	5411.63	5415.62	5415.97	5417.00	0.020840	9.43	87.41	55.58	1.32			9.43	3.99
71.375*	824.0	5411.47	5415.11	5415.53	5416.71	0.022164	10.13	81.34	49.01	1.39			10.13	3.64
71.25*	824.0	5411.31	5414.72	5415.15	5416.43	0.021082	10.49	78.58	43.54	1.38			10.49	3.41
71.125*	824.0	5411.15	5414.44	5414.85	5416.18	0.018296	10.58	77.91	38.02	1.30			10.58	3.29

Profile Output Table - No Name Arroyo Reconstructed Channel 100yr-6hr
 HEC-RAS Plan: Postmine River: No Name Reach: Reach 1 Profile: PF 4

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Vel Lt (ft/s)	Vel Rt (ft/s)	Vel Total (ft/s)	Max Chnl Depth (ft)
71	824.0	5410.99	5414.41	5414.67	5416.01	0.013178	10.17	82.71	38.19	1.12	1.69		9.96	3.42
70.875*	824.0	5410.89	5414.13	5414.55	5415.81	0.017685	10.45	81.03	45.81	1.29	2.27		10.17	3.23
70.75	824.0	5410.79	5413.95	5414.36	5415.56	0.017290	10.26	83.62	48.17	1.27	2.72		9.85	3.16
70.6166*	824.0	5410.69	5413.93	5414.18	5415.27	0.014903	9.32	89.82	50.80	1.18	1.89		9.17	3.24
70.4833*	824.0	5410.58	5414.49	5413.89	5415.05	0.004425	6.00	140.22	64.12	0.67	1.28	0.61	5.88	3.91
70.35	824.0	5410.48	5414.59	5413.48	5414.94	0.002203	4.78	180.77	70.52	0.49	0.74	1.66	4.56	4.11
70.175*	824.0	5410.35	5414.48	5413.55	5414.89	0.003105	5.12	161.71	67.38	0.56	0.62		5.10	4.13
70	824.0	5410.22	5414.43	5413.48	5414.83	0.003017	5.08	162.61	67.11	0.56	0.38		5.07	4.21
69.75*	824.0	5410.04	5414.32	5413.43	5414.75	0.003239	5.31	160.94	70.51	0.58	1.39		5.12	4.28
69.5	824.0	5409.85	5414.22	5413.50	5414.67	0.003790	5.47	162.58	76.23	0.62	2.18		5.07	4.37
69.3333*	824.0	5409.72	5414.18	5413.30	5414.60	0.003183	5.28	168.50	75.60	0.57	1.87		4.89	4.46
69.1666*	824.0	5409.59	5414.14	5413.14	5414.55	0.002771	5.22	170.65	73.24	0.54	1.61		4.83	4.55
69	824.0	5409.46	5414.08	5413.00	5414.50	0.002607	5.30	167.76	70.15	0.53	1.41		4.91	4.62
68.75*	824.0	5409.27	5414.11	5412.85	5414.40	0.002028	4.47	202.87	84.81	0.46	1.64		4.06	4.84
68.5	824.0	5409.08	5414.03	5412.67	5414.35	0.002420	4.53	181.91	93.24	0.50			4.53	4.95
68.375*	824.0	5408.98	5414.08	5412.57	5414.29	0.001502	3.86	237.33	89.11	0.40	1.98		3.47	5.10
68.25	824.0	5408.88	5414.07	5412.46	5414.27	0.001234	3.73	249.15	84.50	0.37	1.99		3.31	5.19
68.13	824.0	5408.78	5414.08	5411.92	5414.24	0.000876	3.48	272.15	79.26	0.32	1.93		3.03	5.30
67.99	824.0	5408.64	5414.09	5411.42	5414.22	0.000561	2.90	295.42	85.84	0.26	0.79		2.79	5.45
67.89*	824.0	5408.58	5414.07	5411.59	5414.22	0.000693	3.04	271.23	74.82	0.28			3.04	5.49
67.79	824.0	5408.51	5414.06	5411.66	5414.21	0.000735	3.06	269.01	76.60	0.29			3.06	5.55
67.65	824.0	5408.41	5413.97	5411.88	5414.19	0.001203	3.73	221.16	67.73	0.36			3.73	5.56
67.4	824.0	5408.21	5413.93	5411.85	5414.16	0.001160	3.84	214.66	60.78	0.36			3.84	5.72
67.2*	824.0	5407.99	5413.82	5411.99	5414.12	0.001539	4.39	187.65	53.43	0.41			4.39	5.83
67	824.0	5407.77	5413.55	5412.36	5414.06	0.002966	5.74	143.64	44.32	0.56			5.74	5.78
66.75*	824.0	5407.70	5413.45	5412.30	5413.99	0.003079	5.86	140.69	43.50	0.57			5.86	5.75
66.5	824.0	5407.63	5413.33	5412.26	5413.90	0.003421	6.08	135.42	42.81	0.60			6.08	5.70
66.255*	824.0	5407.58	5413.07	5412.25	5413.79	0.004383	6.81	121.04	38.53	0.68			6.81	5.49
66.01	824.0	5407.52	5412.67	5412.20	5413.64	0.006448	7.88	104.51	33.98	0.79			7.88	5.15
65.84*	824.0	5407.39	5412.21	5412.10	5413.48	0.009263	9.03	91.23	32.86	0.96			9.03	4.82
65.67*	824.0	5407.25	5411.94	5411.94	5413.30	0.010117	9.35	88.10	32.50	1.00			9.35	4.69
65.5	824.0	5407.12	5411.36	5411.65	5413.06	0.013980	10.47	78.70	31.35	1.16			10.47	4.24
65.25*	824.0	5406.85	5411.71	5411.38	5412.69	0.006980	7.95	103.64	37.10	0.84			7.95	4.86
65	824.0	5406.58	5411.55	5411.32	5412.50	0.007832	7.81	105.52	42.29	0.87			7.81	4.97
64.8*	824.0	5406.58	5411.44	5411.14	5412.33	0.007041	7.58	108.66	42.54	0.84			7.58	4.85
64.6*	824.0	5406.58	5411.30	5410.95	5412.19	0.006882	7.57	108.86	42.18	0.83			7.57	4.72
64.4	824.0	5406.58	5411.06	5410.79	5412.04	0.007596	7.93	103.94	40.31	0.87			7.93	4.48
64.175*	824.0	5406.38	5411.27	5410.40	5411.76	0.003717	5.62	146.60	56.27	0.61			5.62	4.89
63.95	824.0	5406.17	5411.37	5410.07	5411.63	0.001851	4.11	202.85	118.53	0.44		0.24	4.06	5.20
63.7633*	824.0	5405.99	5411.29	5410.06	5411.59	0.002207	4.39	187.78	70.87	0.48			4.39	5.30
63.5766*	824.0	5405.81	5411.20	5410.08	5411.54	0.002575	4.70	175.44	67.47	0.51			4.70	5.39
63.39	824.0	5405.63	5411.10	5410.04	5411.49	0.002850	5.00	164.81	62.29	0.54			5.00	5.47
63.2066*	824.0	5405.46	5411.09	5409.81	5411.43	0.002323	4.67	176.30	63.21	0.49			4.67	5.63
63.0233*	824.0	5405.30	5411.08	5409.48	5411.37	0.001767	4.36	189.16	61.11	0.44			4.36	5.78
62.84	824.0	5405.13	5411.08	5409.13	5411.33	0.001353	4.09	201.67	58.16	0.39			4.09	5.95
62.6	824.0	5405.13	5411.09	5408.81	5411.29	0.001001	3.62	230.83	81.16	0.34		0.37	3.57	5.96
62.475*	824.0	5405.13	5410.95	5409.25	5411.26	0.001649	4.53	185.92	67.10	0.43		0.61	4.43	5.81
62.35	824.0	5405.13	5410.58	5409.62	5411.20	0.003698	6.37	134.29	60.75	0.62		0.84	6.14	5.44
62.175*	824.0	5405.10	5410.53	5409.65	5411.13	0.003725	6.22	135.50	58.80	0.63		0.73	6.08	5.43
62	824.0	5405.08	5410.47	5409.66	5411.05	0.003867	6.14	136.84	55.63	0.63		0.95	6.02	5.39
61.75*	824.0	5405.03	5410.14	5409.60	5410.92	0.005536	7.08	117.12	47.12	0.75		0.78	7.04	5.11
61.5	824.0	5404.98	5409.85	5409.46	5410.75	0.006513	7.63	108.02	40.79	0.81		0.42	7.63	4.87
61.25*	824.0	5404.82	5409.86	5409.20	5410.54	0.004876	6.66	123.81	46.89	0.71		0.40	6.66	5.04
61	824.0	5404.66	5409.94	5408.79	5410.37	0.002619	5.30	162.86	69.18	0.53	1.15	0.41	5.06	5.28
60.75*	824.0	5404.53	5409.90	5408.54	5410.30	0.002127	5.11	171.00	71.13	0.49	0.92	0.94	4.82	5.37
60.5	824.0	5404.39	5409.86	5408.37	5410.25	0.001947	5.07	175.31	66.81	0.47	0.76	1.46	4.70	5.47
60.25*	824.0	5404.26	5409.63	5408.49	5410.17	0.003118	5.93	140.35	50.74	0.58	0.68	0.35	5.87	5.37
60	824.0	5404.13	5409.20	5408.63	5410.04	0.005738	7.39	111.55	39.08	0.77	0.10		7.39	5.07
59.75*	824.0	5404.00	5409.15	5408.43	5409.87	0.005033	6.83	120.59	42.96	0.72			6.83	5.15
59.5	824.0	5403.88	5409.00	5408.39	5409.74	0.005495	6.92	119.59	46.56	0.74		0.94	6.89	5.12
59.25*	824.0	5403.84	5408.84	5408.29	5409.61	0.005481	7.03	118.13	46.75	0.75		0.99	6.98	5.00
59	824.0	5403.80	5408.74	5408.16	5409.46	0.005043	6.86	122.21	49.79	0.72		1.16	6.74	4.94
58.82*	824.0	5403.67	5408.67	5407.99	5409.37	0.004723	6.74	123.85	59.66	0.70		1.04	6.65	5.00
58.64*	824.0	5403.54	5408.58	5407.80	5409.28	0.004674	6.70	124.00	96.01	0.70		0.93	6.65	5.04
58.46	824.0	5403.41	5408.47	5407.78	5409.19	0.004969	6.79	122.00	117.01	0.71		0.82	6.75	5.06
58.23*	824.0	5403.30	5408.58	5407.71	5409.01	0.002918	5.57	210.07	178.28	0.56	1.26	0.79	3.92	5.28
58	824.0	5403.19	5408.59	5407.66	5408.92	0.002225	5.06	248.23	182.53	0.49	1.37	0.74	3.32	5.40
57.8825*	824.0	5403.17	5408.64	5407.56	5408.87	0.001599	4.45	293.62	183.14	0.42	1.42	0.64	2.81	5.47
57.765*	824.0	5403.16	5408.66	5407.47	5408.83	0.001206	3.97	335.60	183.30	0.37	1.42	0.59	2.46	5.50
57.6475*	824.0	5403.14	5408.68	5407.42	5408.81	0.000937	3.57	376.05	183.51	0.32	1.41	0.55	2.19	5.54
57.53	824.0	5403.12	5408.69	5407.37	5408.79	0.000749	3.24	414.97	183.92	0.29	1.38	0.50	1.99	5.57

Profile Output Table - No Name Arroyo Reconstructed Channel 100yr-6hr
 HEC-RAS Plan: Postmine River: No Name Reach: Reach 1 Profile: PF 4

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Vel Lt (ft/s)	Vel Rt (ft/s)	Vel Total (ft/s)	Max Chnl Depth (ft)
57.38	824.0	5403.07	5408.59	5406.82	5408.77	0.001036	4.32	358.19	181.53	0.36	1.39	1.77	2.30	5.52
57.23	824.0	5403.06	5408.47	5406.83	5408.74	0.001277	4.47	270.27	170.97	0.39	1.00	1.59	3.05	5.41
57	824.0	5403.03	5408.44	5407.29	5408.70	0.001689	4.61	274.61	171.42	0.43	1.44	0.77	3.00	5.41
56.75*	824.0	5402.90	5408.43	5407.25	5408.66	0.001418	4.46	306.41	192.26	0.40	1.37	0.84	2.69	5.53
56.5	824.0	5402.77	5407.23	5407.23	5408.49	0.008226	9.06	95.73	139.74	0.93	1.31	1.36	8.61	4.46
56.375*	824.0	5402.67	5407.36	5407.36	5408.04	0.004698	7.24	177.31	156.54	0.71	1.72	1.31	4.65	4.69
56.25*	824.0	5402.58	5407.07	5407.30	5407.95	0.006320	8.12	156.74	154.10	0.82	1.80	1.59	5.26	4.49
56.125*	824.0	5402.48	5406.90	5407.15	5407.85	0.007119	8.52	154.10	163.18	0.87	1.84	1.82	5.35	4.42
56	824.0	5402.38	5406.71	5407.00	5407.75	0.008082	8.94	150.96	168.24	0.92	1.92	2.11	5.46	4.33
55.875*	824.0	5402.38	5406.59	5406.89	5407.65	0.008624	9.12	149.57	164.79	0.95	2.05	2.10	5.51	4.21
55.75*	824.0	5402.38	5406.47	5406.82	5407.54	0.009089	9.26	149.27	162.06	0.97	2.18	2.08	5.52	4.08
55.625*	824.0	5402.38	5406.37	5406.70	5407.40	0.009156	9.22	153.24	163.16	0.96	2.28	2.04	5.38	3.99
55.5	824.0	5402.38	5406.56	5406.56	5407.14	0.005242	7.36	207.12	183.52	0.74	2.15	1.69	3.98	4.18
55.375*	824.0	5402.38	5406.45	5406.45	5406.99	0.005004	7.04	210.68	189.22	0.72	2.05	1.60	3.91	4.07
55.25*	824.0	5402.38	5406.34	5406.34	5406.85	0.004863	6.77	213.62	193.57	0.71	1.98	1.62	3.86	3.96
55.125*	824.0	5402.38	5406.22	5406.22	5406.71	0.004875	6.57	214.96	198.16	0.71	1.95	1.52	3.83	3.84
55	824.0	5402.38	5406.18	5406.18	5406.58	0.004222	6.04	231.23	204.68	0.66	1.88	1.39	3.56	3.80
54.875*	824.0	5402.38	5405.93	5406.02	5406.50	0.006512	7.02	195.58	198.99	0.80	2.08	1.19	4.21	3.55
54.75*	824.0	5402.38	5405.95	5405.93	5406.41	0.005459	6.48	215.07	201.76	0.74	2.10	0.94	3.83	3.57
54.625*	824.0	5402.37	5405.89	5405.85	5406.33	0.005557	6.43	217.48	202.82	0.74	2.16	0.63	3.79	3.52
54.5	824.0	5402.37	5405.83	5405.77	5406.25	0.005721	6.41	219.28	203.79	0.75	2.22	0.17	3.76	3.46
54.25*	824.0	5402.29	5405.60	5405.60	5406.09	0.006515	6.93	207.83	199.87	0.80	2.36	0.95	3.96	3.31
54	824.0	5402.20	5405.34	5405.40	5405.91	0.008036	7.59	194.61	191.95	0.88	2.63	1.53	4.23	3.13
53.8233*	824.0	5402.10	5404.96	5405.17	5405.71	0.012535	8.53	167.69	187.80	1.08	2.95	1.73	4.91	2.86
53.6466*	824.0	5402.01	5405.05	5404.93	5405.40	0.006266	6.25	232.84	221.36	0.77	2.43	1.79	3.54	3.04
53.47	824.0	5401.91	5405.06	5404.73	5405.27	0.003902	4.97	290.65	249.39	0.61	2.11	1.72	2.84	3.15
Max							10.45	Avg						
Min							2.90							
Avg							6.39							

Only the reconstructed channel reaches were included in determining the maximum, minimum, and average velocities. The reconstructed reaches are from Station 81.50 to 72.23 and from Station 71.00 to 67.00.

Attachment 35.C

Approximate Original Contour Technical Report – No Name Permit
28 March 2008

FINAL REPORT

APPROXIMATE ORIGINAL CONTOUR TECHNICAL REPORT- NAVAJO MINE EXTENSION PROJECT

Prepared for
BHP Billiton
300 West Arlington, Suite 200
Farmington, NM

March 28, 2008

URS

URS Corporation
8181 E. Tufts Avenue
Denver, Colorado 80237
Project No. 22236776
(Binder No. 10370)

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Attachment A Technical Memorandum from URS to BHP Billiton dated September 28, 2007, Baseline Channel Inventory and Drainage Density Survey for Pinabete and No Name Arroyos (NMEP Area 4 South and northern section of Area 5).

Attachment B Drainage Density Field Survey of Area 4S Photo Log

INTRODUCTION

BHP Navajo Coal Company (BNCC) plans to develop an expansion surface coal project in northern New Mexico, the Navajo Mine Extension Project (NMEP). The NMEP is located in San Juan County on the Navajo Indian Reservation adjacent to BNCC's Navajo Mine, within the BHP Navajo Coal Company Lease Area. The NMEP will include BNCC lease Areas 4 South (4S) and 5; however, this project focuses on Area 4S.

An Approximate Original Contour (AOC) reclamation surface was developed within Area 4S of the BNCC mine lease. The AOC is being developed in order to satisfy regulatory, corporate and commercial requirements that BNCC must comply with before beginning mining within the area. To develop the AOC, the existing drainage conditions must be approximated and recreated. These include the Pinabete Arroyo and its tributary channels. Additionally, during mining the drainage upstream of the southern pit boundary will be temporarily diverted and conveyed into the adjacent No Name Arroyo. Post-mining, the surface water drainage from the reclaimed mine area will flow into the re-established Pinabete Arroyo and drainage channels.

FIELD INVESTIGATION

A field investigation was completed from August 27 to 29, 2007, to conduct a drainage density survey of the Pinabete and No Name Arroyos within the NMEP Area 4S. The field investigation included examining the Pinabete and No Name Arroyos and their major tributaries to develop inputs for the AOC analysis. Data gathered included drainage density, tributary lengths and associated areas, sinuosity, width to depth ratios, length between channels (Head to ridge length), and length between meanders in steep channel sections (A-channel length).

Several drainage areas were identified for the field investigation prior to and during the field survey based on their identified hydrologic features, soil types, channel and surrounding areas relief. This included review of three to four separate watersheds over the three-day period.

DESIGN BASIS

The *Carlson Natural Regrade with GeoFluvTM* model software (Natural Regrade) software was utilized to develop the AOC reclamation surface. This is a computer model that applies fluvial geomorphic principles to develop a landscape design that generally mimics the natural landscape, as it would evolve over time under existing physical and climatic conditions. The product of the model represents the guide to design and build a suitable stable landform. The model generally follows the morphologic principles developed by Dave Rosgen (Rosgen, 1996). The input variables include:

- Boundary Conditions
- Watershed Characteristics
- Hydrologic/Hydraulic Parameters

The majority of the above parameters were developed from field data, including the drainage density, channel sinuosity, ridge to head length and A-channel length.

Boundary Conditions

Project limits include identification of the overall regrade boundary, potential drainage basin, location of the main channel and elevations and the head and mouth of the main channel. The project limits were set by the BNCC Lease Boundary for Area 4S.

Watershed Characteristics

Watershed characteristics include the identification of a reference watershed, drainage density, establishment of angles for channel confluences, and classification of stream orders.

A reference watershed was chosen for the area that would have the same general characteristics, soil type, relief, drainage pattern and precipitation as that which is proposed for the post reclamation area. Drainage Basin 18 was used as the reference watershed because it was the most typical of the watersheds in the Project area.

Drainage density is a measurement of channel spacing and is generally the ratio of the total length of channel to the drainage area. The drainage density of the Project area was evaluated during the field investigation. Several drainage basins were examined, including, Drainage Basins 18 and 28. Drainage Basin 18 was relatively flat with the majority being alluvial deposits, Drainage Basin 28 has steeper slopes and rock outcrops. The drainage densities for Drainage Basins 18 and 28 were 20 and 260 feet per acre (ft/acre) respectively. Drainage Basin 18 was considered to be within an alluvial deposit. The soil type within an alluvial deposit is the most representative of the post-mining soil condition.

As part of the reclamation model, a representative drainage density had to be evaluated for the site. The appropriate drainage density should be a function of terrain aspect and slope as well as precipitation and soils. The overall reference drainage density is between 25 and 80 ft/acre based on the location within the regraded site, the lower being on the south and the higher being to the north.

The channel confluences with the reclaimed or AOC surface were modified to have sufficient angle and velocity to transport sediment through the confluence and to enter the main channel at the concave outer bank of the meander where possible.

Hydrologic/Hydraulic Parameters

The Natural Regrade model estimates widths and depths for the channel based on precipitation during the 2-year, 1-hour and the 50-year, 6-hour storm events. Precipitation depths for these storm events are estimated based on the location and the elevation of the proposed reclamation site. The precipitation depths estimated for the proposed reclamation area are 0.62 and 2.67 inches for the 2-year and 50-year storms, respectively.

Natural Regrade defaults to the Rational Method to estimate peak discharges for the channels. Comparing the values from three methods, the Rational Method, the preliminary SEDCAD™ model, and the SCS unit-hydrograph method suggest that the values from the SCS method appear to be the most representative of the current hydrologic conditions. For offsite basins, SCS unit discharge rates were utilized for estimating the upstream watershed contribution to channels. However, for channels originating within the geofluvial boundary the Rational Method is used for comparing hydrographs of the basin and, are appropriate for the smaller basin where both

SEDCAD™ and the SCS method do not apply. Natural Regrade utilizes the peak discharges estimated by the rational method to size the onsite channels. To adjust for the inaccuracy of the Rational Method, the coefficient was reduced based on the results of the SCS methodology. The resulting coefficient utilized was 0.75. Using this coefficient, the Natural Regrade model calculated channel widths and depths that were representative of the existing hydrologic conditions.

The Natural Regrade model uses the permissible velocity method utilizes a parameter called the maximum discharge velocity. The velocity is defined based on the soil materials that will be utilized in the channel bed formation. Based on review of the soil type and the previously utilized velocities for this area, a velocity of 4.5 feet per second (fps) was utilized based on previous studies by the Natural Regrade software developer.

APPROXIMATE ORIGINAL SURFACE

Following the design basis outlined above, a surface configuration was developed to reflect the post-mining topography of the project site. The site was broken down into seven major drainage basins, three on the west and two on the east side of the Pinabete reconstruction, and two contributing runoff offsite.

The limits of seven basins on the project site were established. These included three on the west side of the Pinabete reconstruction, two on the east side, and two watersheds that convey runoff offsite. The overall site drainage density was estimated as 30 ft/acre.

A cut and fill analysis was completed to evaluate the AOC in comparison with the PMT. The Natural Regrade software was utilized to evaluate the excavation requirements. The overall cut and fill for the site was estimated as 82,000,000 cubic yards (Mcy) and 73Mcy respectively. The average depth of cut and fill for the entire surface is approximately 25 and 28 feet respectively. The overall percent difference in cut versus fill is approximately 10 percent.

BHP Navajo Coal Company (BNCC) requested URS Corporation (URS) develop an Approximate Original Contour (AOC) reclamation surface within Area 4 South (4S) of the BNCC mine lease. The AOC is being developed in order to satisfy regulatory, corporate and commercial requirements that BNCC must comply with before beginning mining within the area.

URS has performed a field investigation, evaluated the existing pre-mine hydrologic and hydraulic conditions, developed a pre-graded and preliminary regraded surface (AOC) from the provided Post Mining Topography (PMT), as well as developed initial cut and fill quantities.

1.1 PROJECT BACKGROUND

BNCC plans to expand a surface coal project in northern New Mexico, the Navajo Mine Extension Project (NMEP). The NMEP is located in San Juan County on the Navajo Indian Reservation adjacent to BNCC's Navajo Mine, within the BHP Navajo Coal Company Lease Area. The NMEP will include BNCC lease Areas 4S and 5; however, this project focuses on Area 4S.

BNCC provided URS with the Post Mining Topography (PMT) for Area 4S as the basis for developing the post-mining drainage network, as part of the AOC. The PMT included the disturbed surface along with the location of ash deposition, box cuts, spoils piles, and ramps for the ultimate pit configuration. The proposed mining activities disrupt the current hydrology of the site, excavating over existing channels and drainage basins. To develop the AOC, the existing drainage conditions must be approximated and recreated. These include the Pinabete Arroyo and its tributary channels.

The Pinabete Arroyo currently runs through the proposed mining area. During mining, the drainage upstream of the southern pit boundary will be temporarily diverted and conveyed into the adjacent No Name Arroyo and the drainage from the active mine area will be contained within the mine site. Post-mining, the surface water drainage from the reclaimed mine area will flow into re-established Pinabete Arroyo and drainage channels. The regrade for the Pinabete Arroyo will serve as the main drainage channel through the reclaimed site and all of the adjacent regraded areas are tributary to this channel.

BHP Billiton has previously used the *Carlson Natural Regrade with GeoFluvTM* model software (Natural Regrade) to develop designs for post-mining reclamation. This program, developed by Carlson Software, was recommended by BNCC for use within this project and was utilized for the development of the AOC. For the program, several watershed, hydrologic, hydraulic, and channel morphologic parameters are required as input to the model. These parameters were developed during a field investigation and through discussions with both the software developer and personnel from BHP Billiton who had previously utilized the model.

1.2 REPORT ORGANIZATION

This report presents the design basis for the developed of the AOC surface. The report has been organized into the following sections:

- Section 1 – Introduction
- Section 2 – Field Investigation
- Section 3 – Design Criteria

- Section 4 – AOC Surface
- Section 5 – References

2.1 FIELD INVESTIGATION

A field investigation was completed from August 27 to 29, 2007, to conduct a drainage density survey of the Pinabete and No Name Arroyos within the NMEP Area 4S. The results of the investigation were previously submitted to BNCC within the technical memorandum dated September 28, 2007, but are summarized within this section to provide clarification for the development of the AOC. For reference, the September 28, 2007 Technical Memorandum is presented as Attachment A of this report.

The field investigation included examining the Pinabete and No Name Arroyos and their major tributaries to develop inputs for the Natural Regrade model. Data gathered included drainage density, tributary lengths and associated areas, sinuosity, width to depth ratios, length between channels (Ridge to Head length), and length between meanders in steep channel sections (A-channel length).

Several drainage areas were identified for the field investigation prior to and during the field survey based on their identified hydrologic features, soil types, channel and surrounding areas relief. This included review of three to four separate watersheds over the three-day period.

2.1.1 Day 1- Reconnaissance and Selection of Representative Drainages

The URS team performed an overall reconnaissance of the area by driving through the project area from north to south over the watersheds of both the arroyos. The first basin explored was Drainage Basin 18. This drainage basin is located immediately downstream of Burnham Road and drains to the Pinabete Arroyo directly downstream of cross section P-3. A Global Positioning System (GPS) receiver was used to mark the drainage features of the tributary channels within Drainage Basin 18.

The channels within Drainage Basin 18 were fairly flat and narrow, with rectangular shapes, having a bottom width varying from less than 1-foot to over 10-feet and sideslopes from 1H:1V to 3H:1V. The main channel extended approximately 5,000 feet to the southwest from the discharge point into the Pinabete, the total length of channel within the basin is 18,400 feet. During the last day of the site visit, the contributing drainage area was estimated. The drainage area is approximately 322 acres. The estimated drainage density was 60 feet per acre (ft/acre).

From the field investigation, it was estimated that there were minimal channels having a classification of A or B, with the majority of the channels classified as C. For this reason, it was difficult to measure A-channel length. Additionally due to the flat area and small changes in grade between channels, there were no measured Ridge to Head lengths that were deemed representative.

The soil within channel was alluvial deposits and bedrock outcrops. The area within the channel identified contained large rock fragments along the channel bottom, extending into the channel side slopes. The channel was unstable resulting in continuous erosion in areas unlined with rock, as presented in Photos 7, 8 and 9, within the attached photo log (Attachment B).

2.1.2 Day 2- A-Channel and Head to Ridge Lengths

During the second day of the field activities, the URS team identified several features within Drainage Basin 22, located adjacent to Drainage Basin 18, and within a northeast portion of Drainage Basin 21. Within both Drainage Basins 22 and the northeast area of Drainage Basin 21, the team identified ridges and valleys where A-channel lengths could be evaluated and the overall terrain contained a greater amount of elevation change including ridges and valleys with concave to convex channels.

The channel lengths were measured and GPS points were taken along the channel alignments to estimate elevation change and length of the A channels. The areas with identifiable ridges and valleys contained a slightly different soil type with less alluvial sands and a greater volume of gravel sized rocks. These areas were found to have a more stable channel formation, narrower with a reduced amount of rilling. The estimated average A-channel length and Ridge to Head length was approximately 30 and 150 feet respectively, with one outlying Ridge to Head length of 650 feet.

At the end of the second day, the URS team examined the two additional basins, Drainage Basin 21 within the Pinabete watershed and Drainage Basin 1 within the No-Name watershed that had been identified as potential sources for information prior to the site visit. Both of these basins had fairly flat topography with no measurable ridges and valleys.

The URS team conducted a foot survey along the Pinabete Arroyo to identify the contributing drainage areas that would be representative a post mine surface after modeling.. The URS team identified Drainage Basin 28 as a potential representative basin for this purpose. This basin was approximately 1 mile downstream, to the northeast of Drainage Basin 18. At the end of the second day, the evaluation of the drainage density in Basin 28 was initiated.

2.1.3 Day 3- Drainage Basin 28 and Input Elevations

On the third day, the URS team continued to measure the length of the channels within Drainage Basin 28. The channels within this basin were steeper than those previously measured, having slopes varying from 2 to 20 percent. The channels were narrow in comparison with those within Drainage Basin 18. The channels generally had a trapezoidal shape, varying bottom width from 0.5 to 4 feet, and 1H:1V to 2H:1V sideslopes. The main channel extended approximately 1,080 feet to the outfall into the Pinabete, the total length of channel within the basin is 2,350 feet. During the last day of the site visit, the contributing drainage area was estimated. The drainage area is approximately 16.8 acres. The estimated drainage density was 140 ft/acre.

Based on our examination in the field, the majority of the channels contained an A-channel reach and a measurable Ridge to Head length. Measurements were taken as deemed necessary on the channels. The estimated average A-channel length and Head to Ridge Length was approximately 20 and 100 feet, respectively.

The soil within this area, adjacent to Drainage Basin 28, was similar to the soil in Drainage Basin 22 identified during the second field day with lower fraction of alluvial deposits and more gravel-sized rocks. For the majority of the channels, it was noted that within the transition between the concave to convex area there were larger rock fragments. Generally, this basin seemed to be more stable than Drainage Basin 18.

During the last part of Day 3, the URS team took GPS data at the estimated upstream and downstream elevation of the main channel within regrade area. Because it was difficult to estimate the exact area, the URS team walked a significant portion of the channel. The upstream and downstream elevations were estimated using GPS readings at 5440 feet and 5310 feet mean sea level (MSL), respectively.

The Natural Regrade software was utilized to develop the AOC reclamation surface. This is a computer model that applies fluvial geomorphic principles to develop a landscape design that generally mimics the natural landscape, as it would evolve over time under existing physical and climatic conditions. The software identifies the type of drainage network that would tend to form over a long period of time given the site's earth materials, relief, and climate to achieve a stable landform. The product of the model represents the guide to design and build a suitable stable landform. The model generally follows the morphologic principles developed by Dave Rosgen (Rosgen, 1996). The input variables include:

- Boundary Conditions
 - Disturbance Limits;
 - Drainage Basins;
 - Local stream base level to which the area within the boundary drains for the main channel; and,
 - Elevation at the head and mouth of the "main" drainage channel.
- Watershed Characteristics
 - Reference Watershed;
 - Length between channels, ridge to head length; and,
 - Meander wavelength within reaches steeper than 4 percent, A-channel length.
 - Target drainage density; and,
 - Stream Classification -Width to depth ratio and sinuosity.
- Hydrologic/Hydraulic Parameters
 - Precipitation from the 2-year, 1-hour and 50-year, 6-hour storm events to determine the bankfull and flood-prone flows;
 - Runoff Coefficient;
 - Offsite Drainage Basins; and,
 - Maximum discharge velocity.

The majority of the above parameters were developed from field data, including the drainage density, channel sinuosity, ridge to head length and A-channel length.

3.1 BOUNDARY CONDITIONS

Project limits include identification of the overall regrade boundary, potential drainage basin, location of the main channel and elevations and the head and mouth of the main channel. The project limits were set by the BNCC Lease Boundary for Area 4S.

The main channel that currently runs through the project limits is the Pinabete Arroyo. Following mining, this channel will be restored and will serve as the main channel through the regrade area. The elevation at the edge of the project limits for both the head and the mouth of the Pinabete was estimated during the field investigation to be 5440 and 5310 feet MSL, respectively. Elevations were estimated using GPS equipment with a tolerance of approximately 0.5 feet.

Contemporaneous reclamation is planned for the site during mining. As part of the contemporaneous reclamation plan the Pinabete Arroyo and tributary drainage basins were laid out to best manage stormwater. A review of the existing drainage basins within the project area was completed during the field investigation. Currently, there are several large drainage basins

contributing to the Pinabete Arroyo. Channels will be constructed concurrently with the conclusion of mining within portions of Area 4S. The Pinabete channel will not be finalized until all mining is completed, as such runoff contributing to the Pinabete will need to be stored in ponds. To minimize the number of ponds required during reclamation the number of confluences with the Pinabete was reduced.

3.2 WATERSHED CHARACTERISTICS

3.2.1 Reference watershed

As part of development of parameters for Natural Regrade, a reference watershed is chosen that will represent the post reclamation area. This watershed has the same general characteristics, soil type, relief, drainage pattern and precipitation as that which is proposed for the post reclamation area. As described within Section 2.1, a field investigation was completed. Prior to the field investigation, several watersheds or drainage basins were identified as potentially representative of the topography in Area 4S. These drainage basins were used as reference watersheds including Drainage Basins 1, 18, 21, 22, and 28 were then evaluated for suitability as reference watersheds during the field reconnaissance. Ultimately, Drainage Basin 18 was used as the reference watershed because it was the most typical of the watersheds in the Project area. Drainage Basin 18 was considered to be within an alluvial deposit. The soil type within an alluvial deposit is the most representative of the post-mining soil condition.

The length from the ridge of a drainage basin to the head of a channel defines the length between channels and drainage basins within the model. This parameter was measured within the field and an average value of 110 feet was utilized.

Within Rosgen's channel classification, channels are classified based on slope and overall channel geometry. A-channels are those which have a slope greater than 4 percent, and tend to occur at the headwaters of a channel or near the ridge lines. During the field investigation measurements were taken of the typical length of the A-channels along with the length of the channel meanders. The length input into the model was 80 feet.

3.2.2 Drainage Density

Drainage density is a measurement of channel spacing and is generally the ratio of the total length of channel to the drainage area. Across the United States, drainage density varies from three to 1300 miles per square mile. The larger the number the higher density or closer together the channels are. Studies have shown that there is a correlation between drainage-density, precipitation and evaporation.

The drainage density of the Project area was evaluated during the field investigation. Lengths were measured from the estimated head to the mouth of the channel. For this study channels were defined as having a minimum 6-inch width and 2 inch depth. Areas with drainages having dimensions smaller than this were not considered within the evaluation of drainage density. Two drainage basins, 18 and 28, were evaluated for drainage density during the site visit. Resulting drainage densities were from 20 to 260 ft/acre.. Drainage Basin 18 is on the southern portion of the site and has mild slopes, minimal bedrock outcrops with alluvial sand deposits. Drainage Basin 18 is representative of the topography of the southern portion of Area 4S as a whole. The

drainage density of Drainage Basin 18 was approximately 20 ft/acre. Drainage Basin 28, on the northeast portion of the site has a significant amount of relief, rock channel bottoms and many bedrock outcrops, resulting in a drainage density of approximately 260 ft/acre.

3.2.3 Channel Confluences

The channel confluences within the reclaimed surface area were evaluated due to the potential for rapid changes in flow, sediment discharge, and changes in hydraulic geometry. There was concern of sediment transport at the channel confluences based on the angle and placement of the incoming channel. Sediment transport studies examining the angle of channel confluences have been completed by others. The *Sediment transport and bed morphology at river confluences* paper by James L. Best describes how the confluence angle and ratio of discharges between the tributary and main channels controls the sediment deposition (Best, 2006). As the confluence angle and discharge increase, the sediment contribution from the confluence channel is transported around rather than in the center of the confluence. Additionally, studies including the *Field Investigation of Flow Structure and Channel Morphology at Confluent Meander Bends* by Riley and Rhoads have shown that natural stream and river confluences tend to occur on the concave outer bank of the meander bends (Riley and Rhoads, 2007).

The channel confluences with the reclaimed or AOC surface were modified to have sufficient angle and velocity to transport sediment through the confluence and to enter the main channel at the concave outer bank of the meander where possible.

3.2.4 Stream Classification

As previously described, the model utilizes principles described by Rosgen. The Rosgen classification for a natural channel is based on slope, width to depth ratio, entrenchment ratio, sinuosity, and streambed particle size. The Rosgen classification scheme describes channels as A through G using multiple and single thread channels to differentiate between geological settings (Rosgen, 1996).

Channels A and A+ are narrower channels that exist in slopes greater than 4 percent. Multiple thread D and single-thread F and G are transitional formed channels that exist as the channel develops a more stable form and are generally associated with high erosion rates, sediment transport and deposition. B type channels have relatively low sinuosity, with stepped transitions generally related to resistant rock strata generally occurring in narrow canyons with limited sinuosity. Types C and E differ through their width-to-depth ratio and sinuosity. An E channel generally has a lower width to depth ratio, is generally stable but is sensitive to disturbance of bank material and vegetation. A Type C channel tends to migrate laterally through cutbank erosion and subsequent deposition.

Based on these classifications channel types A, C and E are generally utilized in developing stable reclamation designs. The model defaults create A and A+ channels at slopes greater than 4 percent and Bc for slopes less than 4 percent, however, this can be modified.

For the design of the Pinabete Arroyo reconstruction, the pre-mining channel conditions were evaluated along with the transition phases of the channel, and the overall objectives defined by BNCC. Based on this evaluation, it was assumed that the existing Pinabete Arroyo is a Type C5c channel. This designates that the channel has a slope less than one percent, the sinuosity

ratio is greater than 1.2, and the width to depth ratio is greater than 12. This channel type is transitional and possibly more stable in another phase. A more stable channel would have higher sinuosity and result in larger radius of curvature than the current condition. A Type C5c channel was utilized for the current design, with an understanding that the channel may tend to degrade and channel banks may erode slightly, forming a deeper low flow section. This channel type utilizes the following channel characteristics:

- Width to Depth Ratio
 - 12 – When the slope is greater than 4 percent
 - 16 – When the slope is less than 4 percent
- Sinuosity Ratio
 - 1.2 – When the slope is greater than 4 percent
 - 1.5 – When the slope is less than 4 percent

These channel characteristics were utilized for all tributary areas to the Pinabete regrade area. The only modification was the subridge spacing on sinusoidal channels, which is applicable for channels with slopes less than 4 percent with floodplains adjacent to the channel.

3.3 HYDROLOGIC/HYDRAULIC PARAMETERS

3.3.1 Precipitation-Bank and Flood Prone

The Natural Regrade model estimates widths and depths for the channel based on precipitation during the 2-year, 1-hour and the 50-year, 6-hour storm events. Precipitation depths for these storm events are estimated based on the location and the elevation of the proposed reclamation site. The precipitation depths estimated for the proposed reclamation area are 0.62 and 2.67 inches for the 2-year and 50-year storms, respectively.

3.3.2 Runoff Coefficient

Natural Regrade defaults to the Rational Method to estimate peak discharges for the channels. Peak discharges for the design storm can also be input at the head of the channel but is not distributed along the length of the channel. The default runoff coefficient for the model is 0.89.

During the development of the conceptual AOC, the Rational Method was utilized to estimate the peak discharge contributing to the head of the onsite channels, with the exception of the Pinabete Arroyo. This resulted in tributary channels that had flood prone widths similar to that of the Pinabete Arroyo. Therefore, it was concluded that the Rational Method was over-estimating the contributing discharge to the channels. Typically, the Rational Method is not recommended for areas larger than 90 acres. In addition, the rational runoff coefficient is not constant across storm events. It varies with the storm event being evaluated, i.e. 0.5 for the 2-year and 0.65 for the 50-year. As a result URS decided to utilize a different method to estimate peak discharges for tributary channels.

To estimate a peak discharge that resulted in flood prone widths similar to those seen in the field, several methodologies for estimating peak discharge were compared. These included the preliminary SEDCAD™ models developed for the Pinabete and No Name Arroyos and the Soil Conservation Service (SCS) Curve Number method. The purpose of the SEDCAD™ model

development is for evaluating potential surface water Probable Hydrologic Consequences (PHC) of the proposed NMEP.

SEDCAD™

Preliminary SEDCAD™ models have been developed for both the Pinabete and No Name Arroyos under the pre-mining and during-mining conditions. The results of the model were compared and the average peak discharge per acre was found to be 0.05 cubic feet per second per acre (cfs/acre) for the 50-year, 6-hour and 0.012 cfs/acre for the 2-year, 1-hour storm events.

SCS Unit Hydrograph Method

The SCS methodology estimates the storm runoff from a drainage basin based on basin size, curve number and lag time. Basin area was delineated using the existing 10-foot contours. SCS curve numbers were estimated based on the soil properties soil condition (type and cover), and assuming an antecedent moisture condition of Type II.

The land use was assumed to be arid to semiarid rangelands with a pinion/juniper cover type and a SCS hydrologic soil group classification of D. The soil condition was assumed to be “good”, with a Type II antecedent moisture condition. The resulting curve number was 85. The method used to calculate sub-basin lag times were estimated by the SCS Curve Number Method.

The rainfall depths previously estimated (0.62 and 2.67 for the 2-year 1-hour and 50-year 6-hour, respectively) were distributed assuming a frequency storm which is typical of the storm event that occurs within the mine area. Rainfall distributions and drainage basin characteristics were then input into the USACE HEC-HMS (Version 3.0.0) rainfall/runoff computer program to calculate the peak discharges for each basin.

Comparing the values from the three methods, the Rational Method, the preliminary SEDCAD™ model, and the SCS unit-hydrograph method indicated that the values from the SCS method appear to be more reasonable for the existing hydrologic conditions. For offsite basins, SCS unit discharge rates were utilized for estimating the upstream watershed contribution to channels. However for channels originating within the geofluvial boundary the Rational Method is used for comparing hydrographs of the basin is appropriate for the smaller basin where both SEDCAD™ and the SCS method do not apply. Natural Regrade utilizes the peak discharges estimated by the Rational Method to size the onsite channels. To adjust for the inaccuracy of the Rational Method, the coefficient was reduced based on the results of the SCS methodology. The resulting coefficient utilized was 0.75. Using this coefficient, the Natural Regrade model calculated channel widths and depths that were representative of the existing hydrologic conditions.

3.3.3 Offsite Contributing Areas

Several channels have upstream drainage basins that contribute runoff to the GeoFluv regraded area, including the Pinabete Arroyo and tributary channels on the east, west and south sides of the regrade area. As part of the initial site investigation, drainage basin boundaries were identified for drainage basins contributing to the proposed regrade area, these are summarized below:

- The Pinabete Arroyo has a drainage basin that is approximately 5 square miles; a portion, about 4,000 acres, is upstream of the Project area, including a portion (4000 acres;)
- The northeast corner of the site drains to the north and into the Pinabete Arroyo downstream of the Project site. This is approximately 277 acres;
- The central portion of the site on the east side has several drainage basins that contribute to the Pinabete Arroyo and were accounted for and integrated in the best as possible configuration into the regraded channels or allowed to flow overland. This includes a total of approximately 301 acres to Panel 3 and 2100 acres to Panel 4 (Figure 2). A portion of this upstream watershed area will be temporarily diverted to and flow within a diversion that will connect to the Pinabete Diversion;
- The southern portion of the site has several drainage basins that contribute to the southern portion of Panel 4 (Figure 2). Drainage channels from these basins will be tied into existing drainages and low points. All contributing runoff will be accounted for in the overall channel capacity required. This is approximately 675 acres;
- Several drainage basins on the southwest side drain into the No Name Arroyo, approximately 101 total acres; these have been included within the regrade but will not drain into the Pinabete.

For the upper watershed contributing to the regraded Pinabete Arroyo, two methodologies were compared to evaluate the contributing runoff. The first methodology was SEDCAD™, which estimated a preliminary value of approximately 180 cubic feet per second (cfs) and 4500 (cfs) for the 2-year, 1-hour and 50-year, 6-hour storm events, respectively. Based on discussions with the Natural Regrade software developer, Nicholas Bugosh, and examining the measured bankfull height and width of the Pinabete Arroyo, it was inferred that the discharge of 180 cfs did not adequately describe the bankfull capacity of the existing channel (Bugosh, 2007a).

Therefore, a normal depth calculation was performed to estimate the representative bankfull discharge for the Pinabete Arroyo at the eastern boundary of the regrade area. Several surveyed channel cross-sections at Pinabete monitoring station P2 were used to estimate the bankfull depth as well as the longitudinal slope of the existing arroyo (Attachment A). The bankfull depth was estimated to be 4-feet with a channel slope of approximately 0.5 percent. Based on these inputs and assuming a Manning's "n" of 0.030, the bankfull discharge was estimated to be about 1,350 cfs. The 1,350 cfs, which represents the 2-year, 1-hour discharge, along with the previously estimated 50-year, 6-hour discharge of 4,500 cfs were then used within the model.

3.3.4 Maximum Discharge Velocity

There are several methods for developing what is considered a stable channel (static equilibrium). These include the permissible velocity approach and the permissible tractive force approach. For the velocity approach, the channel is assumed to be stable if the mean channel velocity is lower than the maximum permissible velocity. The tractive force approach examines the channel stresses developed at the interface between water and the material at the channel boundary. Permissible tractive force has been defined as the maximum force that will not result erosion of the channel bed material.

The Natural Regrade model uses the permissible velocity method utilizes a parameter called the maximum discharge velocity. Maximum discharge velocity is based on channel bed soil

materials. Based on review of the soil type and the previously utilized velocities for this area, a velocity of 4.5 feet per second (fps) was utilized. Additionally, this value was developed as representative of minimal channel erosion in the preliminary studies completed in the development of the Natural Regrade model (Bugosh 2007b).

Section Four provides a brief description of the layout of channels and drainage basins within the proposed AOC, the developed drainage density, and the overall earthwork to develop the surface as compared with the PMT.

4.1 SURFACE CONFIGURATION

Following the design basis outlined above, a surface configuration was developed to reflect the post-mining topography of the project site. The site was broken down into seven major watersheds, three on the west and two on the east side of the Pinabete reconstruction, and two contributing runoff offsite. Figure 2 presents the designed AOC.

On the west side, there is one major channel within that contributes runoff to the Pinabete, this channel is directed from the north to the south of the site with several contributing channels along the way. The channel was directed against the natural basin flowpath to reduce the gradient of the channel, facilitate contemporaneous reclamation, and optimize the overall earthwork required within this area. This basin has been designated West 2. Directly to the south, there is a small watershed which contributes directly to the Pinabete reconstruction this is designated the West 1 basin. The West-Pinabete watershed is immediately east of West 2. West 2 and West-Pinabete are separated by a ridge. This ridge was located as an area where ash fill can be placed. Runoff to the east of this ridge runs directly into the Pinabete reconstruction through a series of channels.

On the east side of the Pinabete reconstruction, the basins are divided into East 1 and East 2. The southern most basin is East 1. This basin includes one major channel and several tributary channels that direct upstream runoff across the reclamation and into the Pinabete reconstruction. The main channel is separated from the Pinabete by a ridge. This area has several significant watersheds that contribute runoff from offsite. Channel alignments were based on identified offsite low-points for the contributing runoff. Basin East 2 contains one main channel and two tributary channels that direct runoff from the north portion of the site into the Pinabete reconstruction. Basins East 1 and East 2 are separated by a ridge.

Finally, there are two basins, offsite north and offsite south that convey runoff offsite. These are on the boundary of the post-mining drainage basin for the Pinabete reconstruction. The offsite north basin contributes runoff into the undisturbed reach of the Pinabete Arroyo downstream of the lease boundary and offsite south basin contributes runoff to the No Name drainage channel to the west of the post-mining drainage basin.

4.1.1 Drainage Density

As part of the reclamation model, a representative drainage density had to be evaluated for the site. The appropriate drainage density should be a function of terrain aspect and slope as well as precipitation and soils. For example, runoff from relatively flat terrain would not be expected to have the same energy and shear stress as if it were from steep terrain and, would not have as complex of a stream pattern. Higher drainage densities, greater than 200 ft/acre, resulted in a large number of channels that didn't necessarily reflect the general current site conditions, particularly in the southwest quadrant of the least area where the terrain is fairly flat. The overall reference drainage density is between 25 and 80 ft/acre based on the location within the regraded site, the lower being on the south and the higher being to the north.

The limits of seven basins on the project site were established. These basins included three on the west side of the Pinabete reconstruction, two on the east side, and two watersheds that convey runoff offsite. The drainage density was defined by the total straight length of the channels (in feet) within the watershed divided by the area of the watershed (in acres), resulting in a unit of ft/acre. The length of the Pinabete was only included in the overall drainage density for the entire site. Table 4.1 summarizes the results of this analysis.

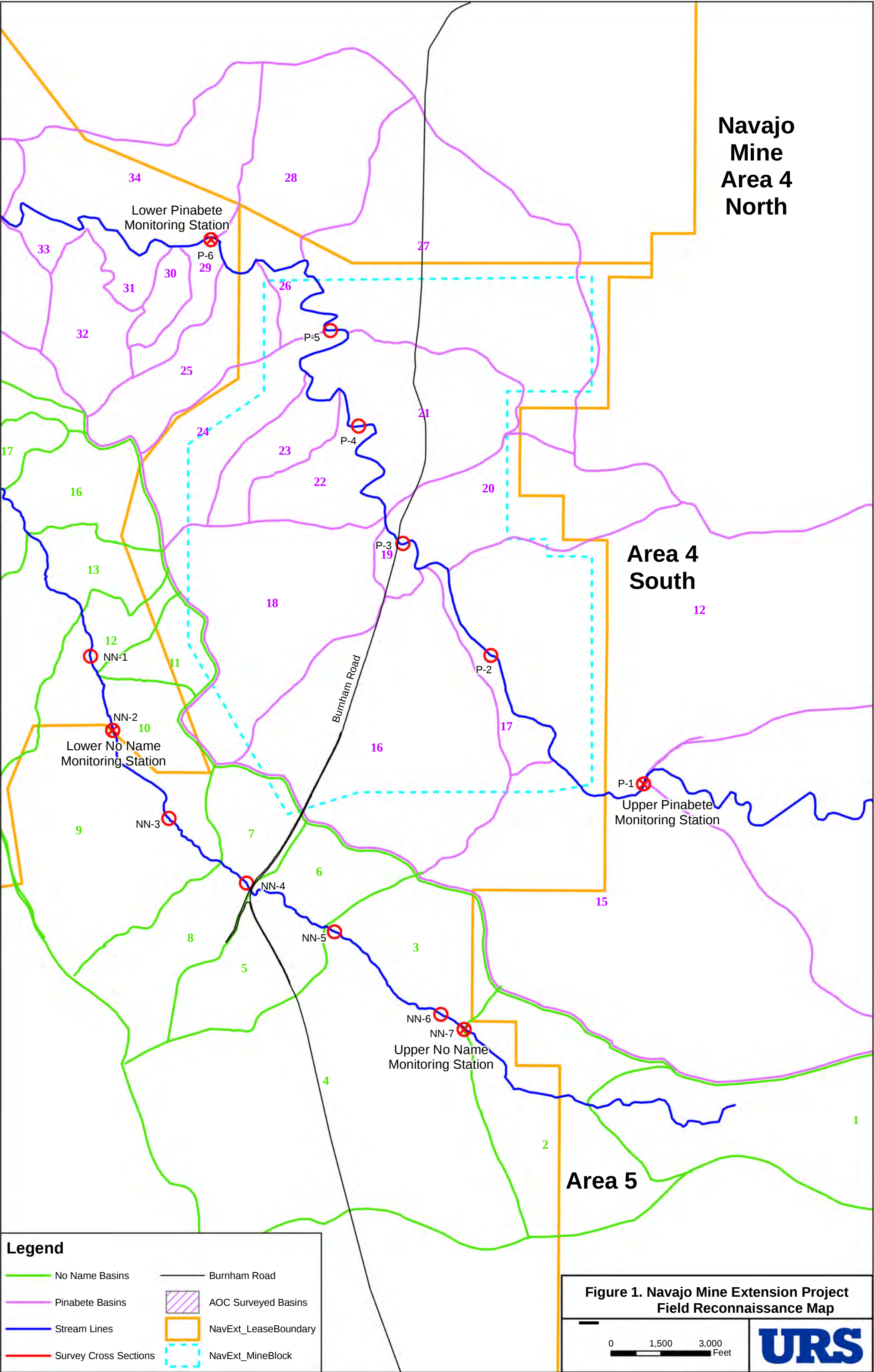
Table 4.1
Drainage Density Analysis

Basin	Drainage Density (ft/acre)
Entire Site	30
West 1 Watershed	12
West 2 Watershed	29
West- Pinabete Watershed	14
East 1 Watershed	37
East 2 Watershed	26
Offsite-North	15
Offsite-South	25

4.2 CUT AND FILL ANALYSIS

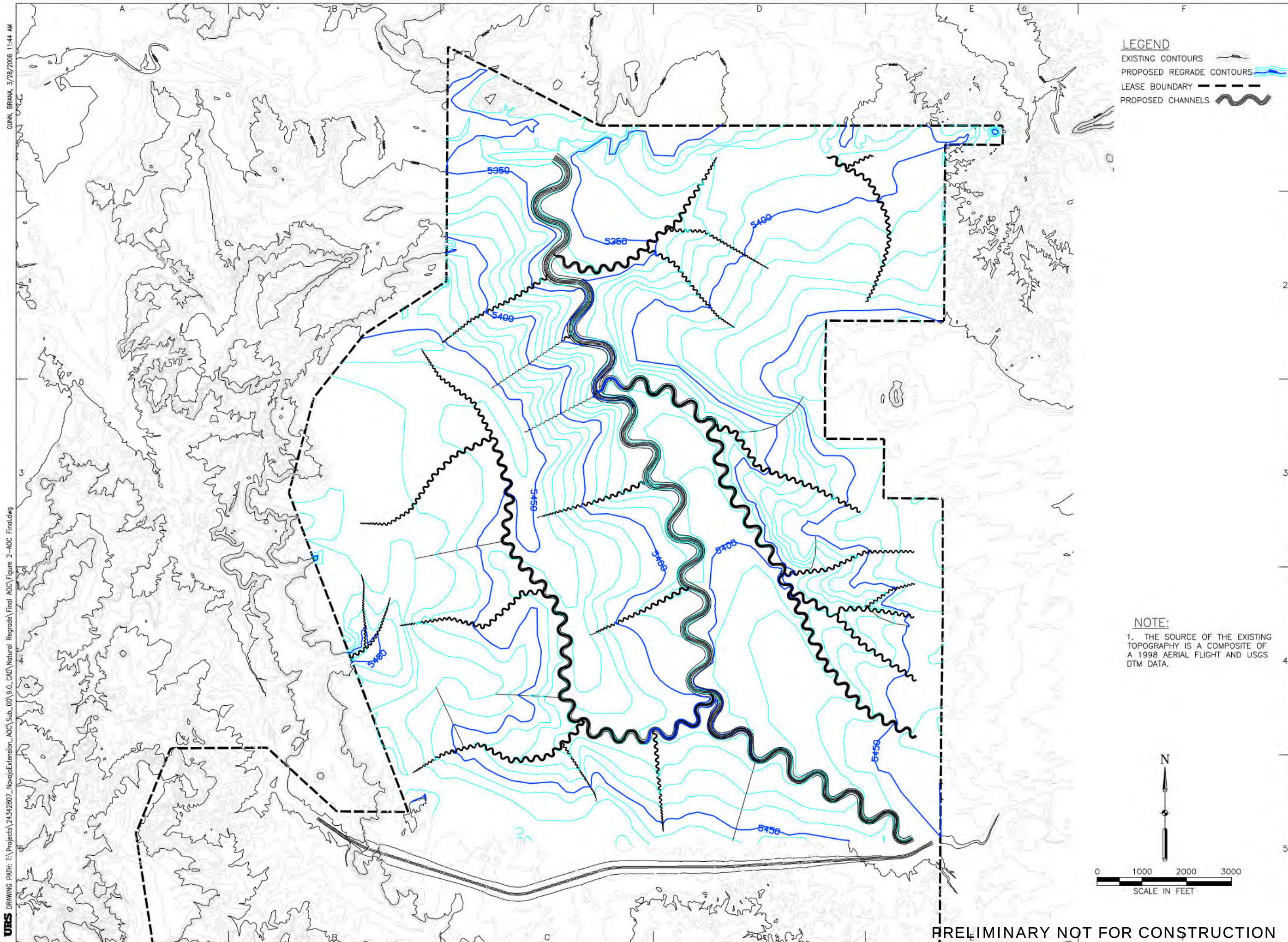
A cut and fill analysis was completed to evaluate the AOC in comparison with the PMT. The Natural Regrade software was utilized to evaluate the excavation requirements. The limits of the cut and fill boundaries were based on the limits of the four dragline pits (panels), the centerline of the Pinabete reconstruction, and the centerline of the ramps to be utilized during mining. Carlson Civil Design 2008™ was used to estimate the cut and fill quantities developing a grid file for each surface and then comparing them, the surface for the AOC-AOC Pregrade Final Rev 4.grd, and the grid file for PMT was PMT.grd. Overall cut and fill is 81,000,000 cubic yards (Mcy) and 73 Mcy respectively, with a percent difference in cut versus fill is approximately 10 percent. The average depth of cut and fill for the entire surface is approximately 25 and 28 feet respectively.

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URS DRAWING PATH: T:\Projects\24342807_NovajoExtension_AOC\Sub_00\9.0_CAD\Natural Regrade\Final AOC\Figure 2-AOC Final.dwg



LEGEND
EXISTING CONTOURS
PROPOSED REGRADE CONTOURS
LEASE BOUNDARY
PROPOSED CHANNELS

NOTE:
1. THE SOURCE OF THE EXISTING TOPOGRAPHY IS A COMPOSITE OF A 1998 AERIAL FLIGHT AND USGS DTM DATA.

N

0 1000 2000 3000
SCALE IN FEET

URS
URS Center
8181 East Tufts Avenue
Denver, Co. 80237-2637
303 694-2770 (phone)
303-694-3946 (fax)

2

3

4

5

REVISIONS

NO.	DESCRIPTION	DATE
△		
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URS PROJECT NO:	24342807
DRAWN BY:	BWG
DESIGNED BY:	BWG
CHECKED BY:	SS
DATE CREATED:	3/21/2008
PLOT DATE:	3/28/2008
SCALE:	1"=1000'
ACAD VER:	17.1S (LMS TECH)
SHEET TITLE	

APPROXIMATE ORIGINAL CONTOURS

FIG. 2

PRELIMINARY NOT FOR CONSTRUCTION

Attachment A
Technical Memorandum From URS To BHP Billiton Dated September 28, 2007

TECHNICAL MEMORANDUM

Date:	September 28, 2007
From:	Bud Brock, PE; Samrat Mohanty, PhD; URS Albuquerque; Briana Gunn, PE; Bill Sabatka, EIT; URS Denver
To:	Brent Musslewhite, Collete Brown, BHP Navajo Coal Company
Subject:	Baseline Channel Inventory and Drainage Density Survey for Pinabete and No Name Arroyos (NMEP Area IV South and northern section of Area V)

Introduction

From August 27 to August 29, 2007, two URS teams independently conducted a baseline channel inventory survey and a drainage density survey on the Pinabete and No Name Arroyos within the Navajo Mine Extension Project (NMEP) Area IV South and Area V. The Pinabete Arroyo is the main drainage path for Area IV South, bisecting the lease by flowing from the southeast corner to the northwest corner. The No Name Arroyo is the main drainage path for Area V, and flows from east to west along its northern boundary, just south of Area IV South. The Pinabete Arroyo is proposed to be diverted into the No Name Arroyo during the mining operation of Area IV South. Figure 1 is a map of the study area.

The baseline channel inventory was performed by the team of Bud Brock and Samrat Mohanty as part of the effort to obtain hydrologic information necessary for evaluation of Probable Hydrologic Consequences (PHC) of the proposed mining operations in Area IV South of the NMEP. The drainage density survey was completed by the team of Briana Gunn and Bill Sabatka to estimate input parameters for the development of the Approximate Original Contours (AOC) for Area IV South.

Baseline Channel Inventory

The specific objectives of the Baseline Channel Inventory effort are:

- Perform reconnaissance of Pinabete Arroyo and No Name Arroyo, including their major tributaries and associated floodplains to describe pre-mining conditions.
- Evaluate channel stability for both the major arroyos.
- Estimate channel characteristics, such as sinuosity and Manning's n values, for use in later modeling efforts.
- Perform limited conceptual classification of bed and bank soils.

Field Reconnaissance Methodology

The URS team performed reconnaissance of the Pinabete Arroyo between the Upper Pinabete Monitoring Station, P-1, and Lower Pinabete Monitoring Station, P-6, and of the No Name Arroyo between Upper No Name Monitoring Station, NN-7, and Lower No Name Monitoring Station, NN-1, as well as their major tributaries and floodplains.

Key channel features identified included road crossings, culverts, dams, tributary junctions, bedrock outcrops, head cuts, bend points, and locations of convex segments within the channel flow path. The conditions of the channels along each course were described, including vegetative conditions in the channel and on the overbanks, the occurrence of steep bank slopes, evidence of bank failure, extent of scouring and deposition along the stream, and the classification of stream bed sediments. Photographs of the channel conditions were taken as part of the channel baseline survey for future reference during the Surface Water PHC project. A representative sample of the photos is presented in the text.

Limited soil classifications were performed on the channel bed and bank soils. Physical characteristics such as gradation, texture, moisture, plasticity, and density were noted for soils at selected locations. Locations were chosen based on their proximity to the monitoring stations, survey cross-sections, and any location with a perceived change in soil type.

Observations on No Name Arroyo

The No Name Arroyo is a fairly “young” arroyo, currently undergoing significant evolution. Overall, the No Name Arroyo is fairly straight for the reach located within the NMEP and flows in a general northwesterly direction. There are numerous small bends and turns in the channel, but they are minor and have little effect on the overall direction of the stream. The exception is the last major bend in the channel, approximately 900 feet upstream of NN-2. At this location, the channel takes a bend of approximately 30-degrees to the north. From here the channel continues on a north-by-northwesterly direction until the confluence point with Chaco River.

The stream characteristics for No Name Arroyo can be divided into two distinct sections, upstream (east) of Burnham Road and downstream (west) of Burnham Road. For the majority of the stream reach upstream of the Burnham Road, there is a narrow, shallow, and discontinuous low flow channel with the capacity to convey runoff from the frequent storm events (1 to 5 year storm events). The low flow channel varies from 1 to 4 feet in depth and 2 to 10 feet in width. Bends in the channel are up to, and in a few locations exceed, 90-degrees. Flows resultant from the larger storm events overtop the low flow channel and are conveyed in a wide ‘U’ shaped shallow concentrated flow area. The shallow concentrated flow area ranges from approximately 50 to 100 feet wide, with some locations approaching 200 feet. The soil has minimal alluvial deposits consisting primarily of a clayey loam. Vegetation in the shallow concentrated flow area consists of low to medium grass with scattered low to medium brush for an effective ground cover of



No Name Arroyo Low Flow Channel
Upstream of Burnham Road

60% to 80%. The Manning's n value for the channel is estimated to be 0.04. The two areas where the channel does not conform to these general statements are described below.

The area from NN-7 to approximately 500 feet downstream, the channel is incised at a depth of 2 to 4 feet and a width of 10 to 20 feet and has significant braiding. With the exception of the rare major storm events, flow is confined to the channel. The vegetation in the channel is consistent with the downstream section; however, the effective ground cover is approximately 50% in the channel resulting in an estimated Manning's n value of 0.035.

Immediately upstream of Burnham Road is the other location where the No Name Arroyo characteristics deviate from the typical channel section described above. Burnham Road acts as a retention structure creating a ponding area on the upstream side of the road. No crossing culverts were found. The gradient of the road slopes downward from north to south with a small dip in the road just south of the effective ponding area before the gradient of the road starts in an upward slope. This dip in the road acts as an overflow location for the ponding area and corresponds to a sandstone outcrop that limits the erosion of the roadway. The ponding area has an effective ponding depth of approximately 4 to 6 feet before flow will inundate the overflow location. It is assumed this ponding area was intentionally created to serve as a cattle watering pond. The bottom of ponding area is covered with clayey soil. There is little to no vegetation in the bottom of the ponding area; however, heavy brush is present on the upstream half of the pond overbanks. This heavy brush extends into and up the channel feeding the pond for



No Name Arroyo Shallow Concentrated Flow Area Upstream of Burnham Road



No Name Arroyo Upstream of NN-7



No Name Arroyo Ponding Area Upstream of Burnham Road Looking Upstream

approximately 500 feet creating an effective ground cover of almost 100% resulting in an estimated Manning's n value for this part of the channel of 0.15.

Vegetation in the overbank area is fairly consistent along the stream reach and is composed primarily of low grass with interspersed low brush covering approximately 5% to 30% of the ground. The soil in the overbank area is fairly consistent with that in the channel, with the exception of the presence of more gravel. There are few medium to large size rocks in the channel or overbank area. The Manning's n value is estimated to be approximately 0.035 for the overbank area.

The overbank areas consist of a gently sloping floodplain area leading to widely spaced rolling hills. The hills range up to approximately 100 feet high and are composed primarily of fractured sandstone gravel intermixed with loose soils. Tributaries in the area are typically shallow concentrated or sheet flow with only a few of the tributaries having incising at the main channel with a head cut depth of 1 to 3 feet. Upstream of the tributary head cut, the flow regime consists of shallow concentrated and sheet flow.

For the majority of the stream reach downstream of Burnham Road, the channel is well defined with incised depths up to 15 feet, steep to vertical side slopes, and bends ranging from 10 to 45-degrees. The soils in the channel banks are collapsible clayey silt. There is a significant amount of fractured sandstone in the bottom of the channel that has washed into the arroyo from the outcroppings to the north or from discrete outcroppings in the channel banks. There are a few scattered locations where fractured sandstone outcroppings are present in the channel banks, almost always on the north side. Sandstone outcroppings were noted in the channel bottom at two locations, approximately 200 feet upstream of NN-2 and approximately 1,500 feet downstream of NN-4. Vegetation in the overbank area is fairly consistent along the stream reach and is composed primarily of low grass with interspersed low brush covering approximately 5% to 30% of the ground surface. The soil in the overbank area is fairly consistent with that in the channel, with the exception of the presence of more gravel. There are few medium to large size rocks in the channel and overbank areas. The Manning's n value is estimated to be approximately 0.035 for this overbank area. Vegetation and Manning's n values in the channel varies from upstream to downstream and are discussed per section below.



No Name Arroyo Sandstone Outcropping
Upstream of NN-2

Immediately downstream of Burnham Road, the channel is difficult to discern due to the thick vegetation consisting of dense salt cedar, brush, and grass constituting an effective ground cover of approximately 100%. Approximately 500 feet downstream of Burnham

Road, the channel flairs out and becomes visible. The channel cross section in this area displays a benched condition. From the channel bank, it drops approximately 8 to 15 feet where it hits a small bench, roughly 5 feet wide. It then drops another 2 to 5 feet to the low flow portion of the channel, which is generally 2 to 5 feet wide. Overall, the channel width varies from approximately 15 to 40 feet wide. This general channel configuration continues downstream for approximately 500 feet to near the location of NN-4. The channel is fairly straight in the area with bends not exceeding 10 to 20 degrees. Due to the thick vegetation, the Manning's n for this portion of the channel is estimated to be 0.15.

From NN-4 to downstream approximately 1,000 feet, the channel is 10 to 12 feet deep and 10 to 20 feet wide. Vegetation in the channel is very thick constituting a ground cover of approximately 80%. Bends are more pronounced and frequent but do not exceed approximately 45 degrees. Due to the thick vegetation, the Manning's n value for this portion of the channel is estimated to be 0.10.



No Name Arroyo at Approximately NN-4

From approximately 1,000 feet downstream of NN-4 to approximately 500 feet downstream of NN-3, the channel is 8 to 10 feet deep and 10 to 20 feet wide. Vegetation in the channel still consists of salt cedar, brush, and low to medium grasses, but the density has decreased to an effective ground cover of approximately 50%. Bends are still fairly frequent but do not exceed approximately 45 degrees. The Manning's n value for this portion of the channel is estimated to be 0.05.

At approximately 500 feet downstream of NN-3, the channel dissipates over the course of approximately 200 feet as it exits a tight meander. The flow regime reverts to shallow concentrated and overland flow for a stretch of approximately 2,000 feet. Where a defined channel exists for this stretch of the arroyo, it is heavily braided, no more than 3 feet deep, and in excess of 30 feet wide. There are stretches where a definitive channel is not present and runoff reverts to sheet flow conditions. Vegetation in the channel and overland flow area is thicker than the downstream channel reaches, consisting of low to medium grasses and weeds, brush, and some salt cedar constituting a ground cover of approximately 50%. The Manning's n value for this portion of the channel is estimated to be 0.04. The overland flow terminates at a major head cut in the channel located approximately 1,000 feet upstream of NN-2. The head cut is approximately 30 feet wide and 12 feet deep. Downstream of the head cut, there is a definable channel as described in the following paragraph.

From the head cut to NN-2, braiding is frequent and the side slopes are vertical. The channel is approximately 8 to 12 feet deep and approximately 10 to 30 feet wide. The top edge of the channel banks tend to be sharp, indicating the channel is relatively new. Bends are fairly minor and range from less than 10 degrees to a maximum of 45 degrees. Vegetation in the channel consists primarily of low grass with some salt cedar and low brush constituting a ground cover of approximately 30%. The Manning's n value for this portion of the channel is estimated to be 0.03.



No Name Arroyo Head Cut Approximately 1,000 Feet Upstream of NN-2

From NN-2 to NN-1, the channel banks are vertical or nearly vertical in most locations. In the locations where the channel banks are not vertical, they range to a side slope of approximately 3H:1V. The top edge of the channel banks have been rounded over by erosion, indicating the incision has been in place for a few years. There is little to no braiding in the channel. Channel depths, widths, vegetative cover, Manning's n value, and bends are consistent with the preceding section.



No Name Arroyo from NN-2 to NN-1

The overbank areas consist of a gently sloping floodplain area with a varied width from 50 to 200 feet leading to a fairly dense clustering of steep hills. The hills are generally up to approximately 100 feet high and are composed primarily of fractured sandstone overlain by loose soils. The majority of the hills have at least one side consisting of a vertical face of fractured sandstone. Tributaries in the area are typically incised at the main channel and upstream for up to 200 feet with a head cut depth of 2 to 5 feet. Upstream of the tributary head cut, the flow regime consists of shallow concentrated and sheet flow.

Observations on Pinabete Arroyo

The Pinabete Arroyo is a well defined and established channel. The overall trend of the channel is fairly straight through the NMEP area flowing in a general north-by-northwesterly direction. Right before the channel exits the mine area, there are a series of bends that result in an almost 90 degree change in the overall direction of the channel leaving it flowing in a west-by-northwesterly direction until its confluence with the Chaco River.

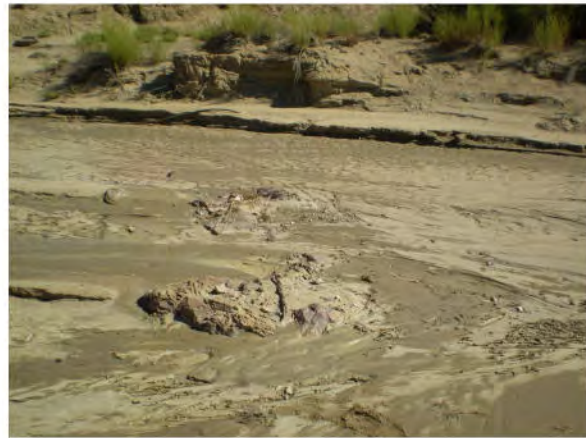
The stream characteristics for the Pinabete Arroyo are fairly consistent through the study area. Typically, the channel is 4 to 10 feet deep and 20 to 80 feet wide with side slopes in the range of 4H:1V to 10H:1V. At the bend points, the side slopes on the outside of the bend transition to vertical. Vegetation in the channel is almost solely confined to the channel banks and consists of low grass, some small brush, and the occasional salt cedar clump. The soil in the channel is primarily silty sand with very little to no clay content. There are a couple of locations where bedrock is exposed in the channel. These are at Burnham Road and approximately half way between P-1 and P-2. Otherwise, the channel is basically devoid of rock of any size, with the exception of the sandstone outcroppings at the bend points. The estimated Manning's n value for the channel is 0.022.

Although the general trend of the arroyo is fairly straight, the sinuosity of the channel is relatively high. There are numerous bend points with angles greater than 90 degrees, with a large percent of the bends approaching 180 degrees. Typically, between the major bend points the channel is fairly straight or has a gentle meander. There are a few locations on the stream reach where the sinuosity is very high, as one bend ties directly into the next and the bends approach or are in excess of 90 degrees. These areas are from P-1 downstream for 1,500 feet, upstream and downstream of P-3 for approximately 1,500 feet, and a 2,500 stretch of the channel centered approximately half way between P-5 and P-6.

Tributaries to the Pinabete Arroyo are typically incised near the confluence point to the main channel. The incising extends



Pinabete Arroyo Typical Channel



Pinabete Arroyo Exposed Bedrock
Between P-1 and P-2



Pinabete Arroyo Typical Bend Point
Upstream of Burnham Road

up the tributary for no more than approximately 300 feet where it terminates in a small head cut of 2 to 5 feet deep.

The overbank area can be divided into two sections, upstream (east) and downstream (west) of Burnham Road. As with the No Name Arroyo, the overbank area upstream of Burnham Road consists primarily of gently rolling hills up to approximately 100 feet high composed primarily of fractured sandstone gravel intermixed with loose soils. The soil in the overbank area is fairly consistent with that in the channel, with the exception of the presence of more gravel. Vegetation is composed primarily of low grass with interspersed low brush covering approximately 5% to 30% of the ground. There are few medium to large size rocks in overbank area. The Manning's n value is estimated to be approximately 0.035 for the overbank area.



Pinabete Arroyo Typical Bend Point
Downstream of Burnham Road

Downstream of Burnham Road, the overbank area is also similar to that of the No Name Arroyo. Typically, a gently sloping floodplain area up to 200 feet wide leads to steep hills up to approximately 100 feet high. The hills generally have at least one vertical face of exposed sandstone with the other sides composed of fractured sandstone and soil. The soil in the overbank area is fairly consistent with that in the channel, with the exception of the presence of more gravel. Vegetation is composed primarily of low grass with interspersed low brush covering approximately 5% to 50% of the ground. There are numerous medium to large size rocks in overbank area consisting of sandstone that has eroded off the nearby hills. The Manning's n value is estimated to be approximately 0.05 for this overbank area.

Drainage Density Survey

This 3-day effort included field reconnaissance of the Pinabete and No Name Arroyos and their major tributaries, developing drainage density data by measuring tributary lengths and areas, measurement of A-channel lengths, and head to ridge lengths.

Several drainage areas for the Pinabete and No Name Arroyos were identified prior to field survey where drainage parameters could be estimated. These locations were selected based on identified hydrologic features and soil types, as well as



Pinabete Arroyo near Confluence of Main
Tributary Channel from Drainage Basin 18

recommendations from environmental staff of BNCC. Pinabete Drainage Basins 18 and 21, and No Name Basin 1 were selected for reconnaissance. Drainage basin designations are based on a SedCAD model developed by BNCC, and are shown on Figure 1. A sampling of the photographs taken during the drainage density survey are presented in the text.

Day – 1

The URS team performed an overall reconnaissance of the area was performed by driving through the project area from north to south over the watersheds of both the arroyos. The first basin explored was Drainage Basin 18. This drainage basin is located immediately downstream of Burnham Road and drains to the Pinabete Arroyo directly downstream of cross section P-3. A GPS receiver was used to mark the drainage features of the tributary channels within Drainage Basin 18.

The tributary channels within Drainage Basin 18 are fairly flat and narrow, rectangular in shape, have a bottom width varying from less than 1 foot to over 10 feet, and side slopes from 1H:1V to 3H:1V. The main tributary channel within Drainage Basin 18 extends approximately 5,000 feet to the southwest from the confluence with the Pinabete Arroyo. The total length of all the tributary channels within the Drainage Basin 18 is 18,400 feet. The contributing drainage area is estimated to be 322 acres. The estimated drainage density is 60 feet per acre (ft/acre).

During the field investigation, the team observed that there were very few channels that could be classified as type A or B, with the majority of the channels consistent with type C. For this reason, only a few A-channel lengths were



Main Tributary Channel from Drainage Basin 18
near Confluence with Pinabete Arroyo



Top Segment of Drainage Basin 18
Main Tributary Channel



Top Ridge within Drainage Basin 18
Note Increased Gravel Content

measured within Drainage Basin 18. However, due to the flatness of the area and the small changes in grade between channels, none of the measured head to crest lengths were considered representative of the project area.

The soil within the tributaries is alluvial deposits with very few bedrock outcrops. The channel contains small to large fractured sandstone fragments along the channel bottom, extending into the channel side slopes. The channel bank is unstable, resulting in sustained erosion except for the areas with high rock concentrations.

Day – 2

During the second day, Drainage Basin 22 and the north end of Drainage Basin 21 were identified to have distinct ridges and valleys containing concave to convex channels where A-channel lengths could be evaluated, and the overall terrain contained a greater amount of elevation change.

In these areas, the tributary channel lengths were measured and coordinates were recorded along the tributary alignments to estimate elevation change and A-channel lengths. Within these areas a soil type that was slightly different than that within Drainage Basin 18 was identified. The soil type has less alluvial sands and a greater volume of gravel. These areas have a more stable channel configuration, which is narrower with a reduced amount of riling. The estimated average A-channel length and head to ridge length are approximately 30 feet and 150 feet, respectively; with one outlying head to ridge length of approximately 650 feet.

Towards the end of the second day, the southern portion of Pinabete Drainage Basin 21 and No Name Drainage Basin 1 were examined. Both these areas have



Center of Tributary Channel 18R1
in Drainage Basin 18



Channel 18 on South Bank of Pinabete Arroyo



Bedrock Outcrop within Main Tributary Channel
of Drainage Basin 18 after Rainfall Event

fairly flat topography with no measurable ridges and valleys, and were therefore not further evaluated.

An attempt was made to identify additional contributing drainage areas in the Pinabete watershed that would be representative of the surface generated by the Natural Regrade model. During this process, Drainage Basin 28 was identified. This basin is approximately 1 mile downstream of Drainage Basin 18.

Day – 3

On the third day, measurements of the lengths of the tributaries within Drainage Basin 28 were conducted. The tributaries within this basin have slopes varying from 2 to 20 percent, which is steeper than tributaries measured in the preceding basins. The tributaries are more narrow in comparison to those within Drainage Basin 18. The tributary channels generally have a trapezoidal shape, a bottom width varying from 0.5 to 4 feet, and 1H:1V to 2H:1V side slopes. The main tributary channel extends approximately 1,080 feet to the confluence with the Pinabete Arroyo. The total length of all tributaries within Drainage Basin 28 is 2,350 feet. The contributing drainage area is approximately 16.8 acres. The estimated drainage density is 140 ft/acre.

The majority of the tributaries were found to contain an A-channel reach with a measurable head to ridge length. Measurements were taken along the tributary channels. The estimated average A-channel length and head to ridge length are approximately 20 and 100 feet, respectively.

The soil type within Drainage Basin 28 is similar to Drainage Basin 22 with a lower amount of alluvial deposits and a large amount of gravel. For the majority of the tributaries, gravel is present at the transition



Typical A-Channel in Drainage Basin 28



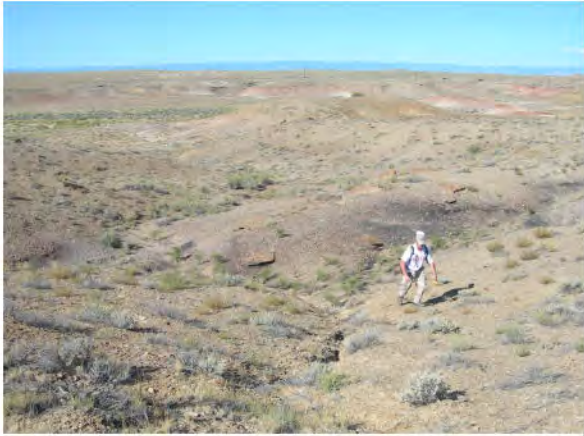
Typical Upstream Channel Segment
in Drainage Basin 28



Typical A-Channel in Drainage Basin 18

between the concave to convex areas. Overall, this basin appears to be more stable than Drainage Basin 18.

GPS data were recorded at the estimated upstream and downstream elevation of the Pinabete Arroyo in the NMEP to be used as input in the Natural Regrade model. The upstream and downstream elevations are estimated to be 5,440 feet and 5,310 feet (Mean Sea Level), respectively.



Typical Geomorphologic Formations
within Drainage Basin 28



Southern Boundary of the Regrade
Area Looking North

Attachment B
Drainage Density Field Survey of Area 4S Photo Log



Photo 1: Pinabete Arroyo near Confluence of the Main Channel from Drainage Basin 18
(Looking Upstream)



Photo 2: Main Channel of Drainage Basin 18 near Confluence with Pinabete Arroyo
(Looking Upstream)



Photo 3: Top Segment of Drainage Basin 18 Main Channel (Looking Upstream)



Photo 4: Top of Ridge within Basin 18 (Looking towards the Channel); Note: Increased Gravel Content



Photo 5: Center of Channel 18 R1 in Drainage Basin 18 (Looking Upstream)



Photo 6: Channel 18 on South Bank of Pinebete Arroyo (Looking Upstream).



Photo 7: Bedrock Outcrop within Main Channel of Basin 18 (Flow after Rainfall Event)



Photo 8: Near Channel 18 (Looking North)



Photo 9: Near Channel 18 (Looking Northeast) at Likely Alluvial Deposits



Photo 10: Typical A-Channel (Looking Upstream towards Ridge)



Photo 11: Typical A-channel in Drainage Basin 28 (Looking Upstream towards Ridge)



Photo 12: Coal Outcrop within a Tributary Basin of Pinabete Arroyo



Photo 13: Typical Upstream Channel Segment within Basin 28

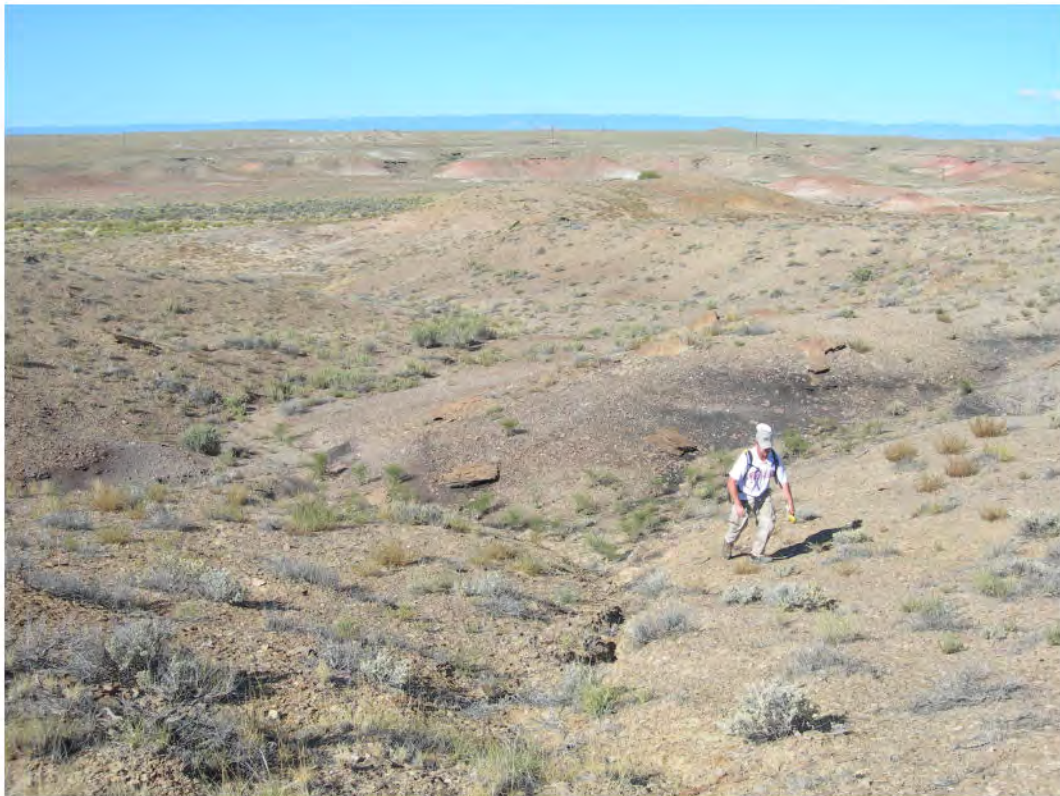


Photo 14: Typical Geomorphologic Formations within Basin 28



Photo 15: Southern Boundary of the Regrade area (Looking Upstream)

Table 35.2-1 HEC-RAS Results Summary No Name Arroyo Undisturbed and Reconstructed Channel Flow Velocities

Storm event	Undisturbed			Reconstructed		
	Q (cfs)	Maximum velocity (fps)	Average velocity (fps)	Q(cfs)	Maximum velocity (fps)	Average velocity (fps)
2-year	101	7.36	4.07	75	5.49	3.74
10-year	412	10.07	5.50	278	8.67	4.79
25-year	655	11.46	6.05	457	9.14	5.47
100-year	1,011	12.56	6.59	824	10.45	6.19

cfs = cubic feet per second

fps = feet per second