Arroyo Grande Creek Waterway Management Program
Update to 2025 Vegetation Management and Sediment Removal Work Plan

The County of San Luis Obispo Flood Control and Water Conservation District (District) has prepared this update to the 2025 Vegetation Management and Sediment Removal Work Plan (Secondary Plan) with support from Rincon Consultants (Rincon) and Wallace Group (WG) to describe maintenance work that is needed within the project area, pursuant to requirements with the following permits issued for the Arroyo Grande Creek Waterways Management Program (WMP; Project):

- National Marine Fisheries Service (NMFS), Biological Opinion, File No. SPL-2012-00317-JWM
- Regional Water Quality Control Board, Clean Water Act Section 401 Water Quality Certification, WDID No. 34012WQ01
- California Department of Fish and Wildlife, Pending Amendment of Routine Maintenance Agreement Notification No. 1600-2018-0115-R4

This Secondary Plan is an addendum to the 2025 Annual Vegetation Management and Sediment Removal Work Plan (2025 Work Plan) and outlines where sediment management is needed, what quantity of sediment is anticipated be removed, when the activity is intended to occur, and the anticipated equipment and approach for the work.

This work plan addresses the objectives, goals, and requirements defined in the project permits and the *Arroyo Grande Creek Channel Waterway Management Program Habitat Mitigation and Monitoring Plan* (HMMP; SWCA 2019). In accordance with permit requirements, this Secondary Plan includes the following specific information:

- Roughness and sediment objectives for proposed maintenance, including the assumptions and rationale used to develop the objectives.
- Necessary sediment removal for flood protection is not in excess of 20 percent of the channel length in any consecutive two-year period (yearly maximum of 2,740 feet in Arroyo Grande Creek and 640 feet in the Los Berros Creek diversion channel).
- No individual sediment removal site exceeds 500 feet along the channel bed and each sediment removal site is separated by a distance where no sediment removal activities will occur in the same year.
- Necessary maintenance on established habitat features (log structures and alcoves).

In accordance with permit requirements, this Secondary Plan describes work proposed for 2026 and future years. As described in the 2025 Work Plan, the District plans to implement sediment removal, log structure maintenance, and levee repair in order to maintain flood capacity, levee stability, instream habitat quality, and log structure and alcove function and stability. Some elements of the work are proposed to be accelerated to occur in 2025 to address existing deficiencies that have potential to result in emergency action if not addressed prior to the 2025-26 rain season.

The following is a description of the proposed work, organized chronologically starting from Fall 2025 into 2026 and beyond. Attached to this document are the engineering plans for work

proposed to occur in 2025 and hydraulic model results for those proposed work areas. Additional details for work proposed in 2026 will be provided in the 2026 Work Plan, as engineering plans are developed for these work areas.

PROJECT OBJECTIVES

Vegetation Objectives

- Increase riparian canopy cover.
- Create and maintain continuous riparian tree cover throughout the project area.
- Increase riparian species richness and density in the action area.
- Rehabilitate the riparian corridor through the removal of invasive, non-native species.

Roughness and Sediment Objectives

- Maintain a composite channel roughness of 0.04
- Maintain a minimum of fifty percent of the designed freeboard for 10-year capacity (i.e., no less than one foot of freeboard for the 10-year storm event).

PROJECT STATUS

Current conditions in the project area include log structures and sediment management zones that are performing as intended and providing high quality habitat, while other locations have degraded habitat and/or flood capacity concerns. Known issues in the project area include continued instability of the levee breach site downstream from the UPRR bridge, sediment accumulation leading to loss of freeboard, channel avulsion and associated loss of riparian shading, and log structure undermining causing head-cutting and erosion in secondary channels.

All necessary avoidance and minimization measures will be implemented for WMP maintenance activities. These measures include, but are not limited to daytime work hours, flagging sensitive resources for avoidance, and pre-activity surveys for special-status species and nesting birds. The project-approved biologist will conduct pre-activity surveys ahead of all maintenance activities for special-status species with a focus on the detection of California red-legged frog (CRLF; Rana draytonii), south-central California coast steelhead (Oncorhynchus mykiss), tidewater goby (Eucyclogobius newberryi), southwestern pond turtle (Actinemys pallida), least Bell's vireo (Vireo bellii pusillus), tricolored blackbird (Agelaius tricolor), coast horned lizard (Phrynosoma blainvillii), California legless lizard (Anniella pulchra), roosting bats, and nesting birds. All pre-activity survey records and findings will be provided in the Annual Monitoring Status Reports. Further, all appropriate agency notifications will be made by the District immediately following the identification of a State or Federally listed threatened or endangered species within the project area.

Based on monitoring and engineering assessments, sediment removal, log structure maintenance, and levee bank re-stabilization are required to achieve the Project objectives and help prevent future emergency actions.

The work proposed in this Secondary Plan is based on the following activities and assessments:

- Log Structure Monitoring
- Hydraulic Engineering Assessment

- 2023 Emergency Capacity Restoration

Log Structure Monitoring
Recommendations for log structure and alcove maintenance are based on monitoring conducted in 2025 (to-date), either confirming or updating observations from 2024 monitoring.

Hydraulic Engineering Assessment
The Project's hydraulic (HEC-RAS) model has been updated with topographic LiDAR data collected in May 2025. LiDAR data and field observations have been used to evaluate vegetation densities and assign corresponding Manning's n roughness values throughout the creek. The calculation procedures within the HEC-RAS model have been refined to increase accuracy of the model for both high flow (flood-risk) and low flow conditions.

This Secondary Plan uses the HEC-RAS model to evaluate flood risk and available freeboard within the project area. The HEC-RAS model will also be used to evaluate proposed work within the creek as maintenance concepts are defined for the individual work areas. HEC-RAS model results are attached to this Secondary Plan. Relevant findings from the model are included in the description of proposed work for the individual SMZs.

2023 Emergency Levee Breach Site Repair
On January 9, 2023, a significant atmospheric river event generated flows that caused a breach of the south levee at the UPRR bridge and resulted in severe flooding in the Cienega Valley. An emergency levee repair was required since creek flows were spilling through the breach site resulting in flooding of adjacent properties. Due to high flow conditions at the time of the emergency, the repair involved placing fill directly into active floodwaters at the breach site to rebuild the levee and contain creek flows. The only viable solution was to repair the earthen levee utilizing rock slope protection (RSP), with class 3 base material placed in lifts and layered with geotextile fabric. A final layer of geotextile fabric and RSP was placed over the inner slope of the levee to project the repaired levee from scour. However, due to high flows during the emergency response, this protective layer of RSP could not be properly bedded into a foundation of RSP trenched below the toe of the slope as is typically specified in RSP designs. The repair was completed by January 17th, 2023, and required a total of approximately 6,250 cubic yards of fill material.

In 2024, the District observed that the breach site repair had become destabilized and that new scour and erosion along the repair site had resulted in the displacement of RSP along the toe of the levee slope. The District's engineers determined that the condition of the breach site repair was unstable and vulnerable to failure. On June 19, 2024, the District prepared a letter initiating the discussion on the need for stabilization of the breach site by repairing the eroded levee slope.

WORK PROPOSED FOR 2025-SMZ 7

The following work is proposed to occur in 2025, to address existing known deficiencies that have potential to result in a repeated emergency action if not addressed prior to the 2025-26 rain season.

2023 Breach Site Re-Stabilization
The existing condition of the 2023 breach site is a steep and unstable armored levee slope that does not support riparian vegetation along the channel bank. In its current state, the breach site does not support the ecological function of the riparian buffer zone as intended throughout the

AGWMP, which formerly existed at this location prior to the levee breach. The pre-breach condition at this location versus existing condition are shown in Figure 1 and 2 below.

Figure 1: Breach Site Location with Intact Riparian Buffer (January 2021)

Figure 2: Existing Levee Breach Site, Looking South (Cannon, Spring 2024)

In consideration of the loss of ecological function at this location and the need to stabilize the breach site to prevent another emergency situation, the District proposes to restore both the

integrity of the levee and the riparian buffer by anchoring approximately 205 cubic yards (115-linear feet) of 18-inch to 36-inch diameter RSP along the base of the existing RSP from the 2023 emergency repair within the inner levee slope.

This activity will require a stream diversion to ensure appropriate species protection during the stabilization activity as approximately 100 cubic yards of RSP is necessary below the OHWM, which is assumed at 1.5-feet above the low flow thalweg. The activity will establish a more stable slope angle that was not accomplished during the 2023 emergency repair. This work is proposed in order to avoid future emergency repair, a typically more impactful activity to the creek as compared to work conducted according to engineered plan specifications and an appropriately planned and established dewatering plan to ensure minimization of potential impacts.

Stabilization of the levee slope at this location will facilitate restoration of the riparian buffer, which was lost during the 2023 flood condition that initiated the emergency repair activity. RSP voids will be soil-filled and a final layer of soil will be placed over the top of the RSP. Native creek bank and creek bed material excavated for the rock placement will be used to fill voids, and additional soil will be brought to the project area as needed to supplement the native material. Approximately 130 cubic yards of soil will be placed, with approximately 20 cubic yards placed within the RSP voids below the assumed OHWM. The graded surface will be hydroseeded and cottonwood cuttings will be placed within the RSP along the toe of the slope. The vegetated RSP is expected to restore the ecological value provided by the riparian buffer that was lost at this location as a result of the levee breach.

Construction of the proposed RSP repair will be conducted by equipment operating from the top of the levee and within the secondary creek channel in dry and/or dewatered conditions. Work is anticipated to last 15 working days and will be completed by October 31. Stream diversion and dewatering to temporarily dewater the channel during construction is anticipated to be necessary. The proposed Stream Diversion and Dewatering Plan and Fish Relocation Plan are attached to this Secondary Plan and in accordance with the WMP will be implemented under direction of qualified biological monitors and include daily water quality monitoring, daily bio monitoring reports and weekly water quality monitoring reports.

UPRR Bridge Sediment Removal

Sediment has accumulated within the secondary creek channel of SMZ 7, both underneath and adjacent to the UPRR bridge, as well as within the discontinuous segment of the riparian buffer 20-feet upstream and downstream of the UPRR bridge. In the existing condition, the sediment bar has widened and lengthened forming an impediment to flow contiguous with the bridge center pier. The existing condition is shown in Figures 3 through 5 below.

Figure 33: Sediment Accumulation in SMZ 7, Looking Downstream (Wallace Group, June 2025)

Figure 4: Vegetation at Upstream UPRR Bridge Face (Wallace Group, June 2025)

Figure 5: Sediment and Vegetation Blocking the UPRR Bridge Opening, SMZ 7 Looking Downstream (Wallace Group, June 2025)

The proposed sediment removal will allow a balance of flood flows between the primary and secondary channels within the UPRR bridge vicinity and reduce potential for a repeated breach of the levee and/or riparian buffer elsewhere in SMZ 7. Hydraulic modeling indicates that the creek enters pressure flow conditions underneath the UPRR bridge during flood flows, resulting in higher velocities on the downstream side of the bridge. Accumulation of sediment upstream of the central bridge pier and within SMZ 7 near the bridge redistributes flow under the bridge, amplifying velocities along the primary channel. These localized hydraulic conditions likely contributed to the 2023 levee breach. Sediment management at the bridge cannot overcome the known hydraulic constraint of the relatively low bridge soffit; however, it will help reduce the prevalence of damaging velocities during higher flow conditions.

The hydraulic model indicates freeboard between 1 and 2-feet in the 10-year storm.

Approximately 300 CY of sediment along 190 LF of the secondary channel is necessary for SMZ 7, which is proposed to occur at the same time the breach site stabilization work and necessary stream diversion is in place at this location. In accordance with permit conditions, vegetation removal will occur only as necessary and is restricted to within 20-feet upstream and downstream of the bridge in order to clear sediment underneath and adjacent to the bridge.

Adjacent to the riparian buffer, the sediment bar will be graded to a maximum slope of 2.5H:1V to provide a stable slope face at the transition between the buffer and creek channels. The graded surfaces will be hydroseeded with the HMMP seed mix, and temporary irrigation may be used to help establish vegetation on the slopes. Existing established vegetation within the

riparian buffer outside of the 20-foot bridge setback will remain in place to anchor and ensure the stability of the remaining sediment bar outside of the grading area.

Sediment and vegetation removal will be conducted by equipment operating within the secondary channel in dry and/or dewatered conditions and from the top of the levee. The work is anticipated to last 5 working days and is proposed to occur concurrently with the RSP repair work that will require a diversion is in place, with all activities completed by October 31. Although stream diversion and dewatering are not necessary for the sediment removal, as stated above, the District anticipates that the sediment removal work would occur during the time period that the creek is dewatered for the RSP repair.

WORK PROPOSED FOR FUTURE YEARS

Sediment Removal, Log Structure and Alcove Maintenance Alcove re-establishment and repairs to damaged log structures are included within the SMZs where sediment management is recommended, to balance sediment removal with improvements to habitat, a key goal of the WMP.

To limit impacts to flowing waters, sediment removal occurring within the secondary channels, historical primary channels, and alcoves would maintain a 3-foot buffer between excavation areas and actively flowing water within Arroyo Grande Creek to the maximum extent feasible. However, in-stream work requiring diversion/dewatering may be necessary in areas of significant sediment deposition up to the edge of the active channel.

Sediment removal would be conducted by equipment operating within the secondary channels and from the top of the levee. The District intends to identify allowable access routes to each work area to minimize impact to existing established native vegetation on the creek banks. In locations with significant invasive species cover, focused clearing may be conducted to allow for increased success of subsequent native vegetation replanting efforts.

Where streambed substrate is recommended to address undercutting or flanking of Type B (downstream) log structures, a gradation will be recommended based on hydraulic parameter output from the HEC-RAS model (e.g. velocity, shear). This gradation may be comprised of native materials, washed gravel, or a layer of gravel filter with larger soil-filled rock. In all cases, fill material will be appropriate for vegetation establishment.

The following is a description of anticipated work, organized by SMZ. Additional details will be provided in the 2026 Work Plan, as engineering plans are developed for these work areas.

<u>SMZ 1</u>
Sediment has accumulated within Log Structure 1A and up the interior top of the structure where the logs are anchored together. Sediment will be removed in and around the log structure to promote pool formation at the log structure. To minimize disruption to the log structure and the riparian buffer minimal sediment removal will occur from immediately underneath the log structure. The intent is that strategic removal around the log structure will allow sediment that has accumulated within the log structure to be mobilized during a subsequent storm event.

The HEC-RAS model indicates that under existing conditions the creek has more than 2 feet of freeboard along the length of SMZ 1. Sediment removal is anticipated to be limited to restoration of the log structure at this time.

Figure 66: Sediment and Vegetation Covering Log Structure 1A, Looking Downstream (Wallace Group, June 2025)

SMZ 2

Sediment has accumulated within Log Structure 2A, as well as upstream of the structure at the entrance of the secondary channel. Sediment will be removed at the channel entrance and around the Log Structure 2A to restore the elevation of the secondary channel entrance and promote pool formation at the log structure. To minimize disruption to the log structure and the riparian buffer minimal sediment removal will occur immediately underneath the log structure. The intent is that removal around the log structure will allow sediment that has accumulated within the log structure to be mobilized during a subsequent storm event.

The HEC-RAS model indicates that under existing conditions the creek has less than 1-foot of freeboard along the upstream half of SMZ 2, and less than 2-feet of freeboard along the lower half of SMZ 2. The model will be used to evaluate the extents of sediment removal required to restore design capacity in this location. The initial estimate of sediment removal quantities and lengths assumes that sediment removal will be limited to the area in and around Log Structure 2A.

Figure 7: Log Structure 2A, Looking Downstream (Wallace Group, June 2025)

SMZ 3

Log Structure 3B has experienced erosion upstream and around the log structure. The river left root wad is fully exposed and the river left footer log is close to fully exposed. The river right footer log is buried. Backfill may be necessary on the upstream side of Log Structure 3B if head cutting continues to propagate upstream.

The HEC-RAS model indicates that under existing conditions the creek will overtop the southern levee in a 10-year storm, along the upstream and downstream ends of SMZ 3. The model will be used to evaluate the extents of sediment removal required to restore design capacity in this location. The initial estimate of sediment removal quantities and lengths assumes that sediment removal is required along the upstream half of SMZ 3.

The potential need for backfill at Log Structure 3B for erosion stabilization will be balanced with the existing loss of freeboard and likely need for sediment removal at this location. A grading strategy to meet flood risk and habitat objectives will be further developed for this location.

Figure 8: Log Structure 3B, Looking Downstream (Wallace Group, June 2025)

SMZ 5

Sediment has accumulated within the secondary channel throughout SMZ 5. The riparian buffer is densely overgrown and visually appears to be a significant barrier to flow during storm events. Recommendations for this area include sediment removal throughout the secondary channel and confirmation of the existing riparian buffer width with additional topographic survey. Based on visual inspection it appears that the mid-channel buffer width has increased due to sediment accumulation followed by vegetation growth. Lidar mapping indicates that the mid channel bar is upwards of 30-feet wide in this location. Sediment removal along the bar may be warranted to re-establish the mid-channel bar to design conditions.

The HEC-RAS model indicates that under existing conditions the creek will overtop the southern levee in a 10-year storm, along the full length of SMZ 5 and extending upstream towards SMZ 6 and downstream through SMZ 3. The model will be used to evaluate the extents of sediment removal required to restore design capacity in this location. The initial estimate of sediment removal quantities and lengths assumes that sediment removal is required along the full length of SMZ 5.

Figure 9: Sediment and Vegetation at Log Structure 5B, Looking Upstream (Wallace Group, June 2025)

SMZ 7

SMZ 7 will be re-evaluated after completion of the proposed 2025 sediment removal and its subsequent function during the 2025-26 rain season.

Figure 10: Sediment Identified for Removal in the Proposed 2025 Plan, Looking Downstream (Wallace Group, June 2025)

SMZ 8

Sediment has accumulated around Log Structure 8A and in the upstream end of SMZ 8. Sediment will be removed at the channel entrance and around Log Structure 8A to restore the elevation of the secondary channel and promote pool formation at 8A. To minimize disruption to the log structure and the riparian buffer minimal sediment removal will occur immediately underneath the log structure. The intent is that removal around the log structure will allow sediment that has accumulated within the log structure to be mobilized during a subsequent storm event.

The HEC-RAS model indicates that under existing conditions the freeboard along SMZ 8 is less than 2-feet along the northern levee, and less than 1-foot along the southern levee. The model will be used to evaluate the extents of sediment removal required to restore design capacity in this location. The initial estimate of sediment removal quantities and lengths assumes that sediment removal is required along the upstream half of SMZ 8.

Figure 11: Sediment and Vegetation Covering Log Structure 8A, Looking Downstream (Wallace Group, June 2025)

SMZ 9

Sediment has accumulated throughout SMZ 9, primarily at the SMZ entrance and on the downstream side of Log Structure 9B. Sediment will be removed from the secondary channel to restore capacity and to promote pool formation downstream of Log Structure 9B.

The HEC-RAS model indicates that under existing conditions the freeboard is less than 1-foot along the southern levee for the full length of SMZ 9. The model will be used to evaluate the extents of sediment removal required to restore design capacity in this location. The initial estimate of sediment removal quantities and lengths assumes that sediment removal is required along the full length of SMZ 9.

Figure 12: Sediment and Vegetation in Secondary Sediment Channel at Log Structure 9B, Looking Downstream (Wallace Group, June 2025)

SMZ 11

Sediment has accumulated in and around Log Structure 11A at the entrance to SMZ 11. Additionally, LiDAR data indicates that sediment may have accumulated in the primary channel and a shallow breach has formed in the mid-channel bar between the primary channel and the secondary channel. Sediment will be removed in the secondary channel, and if deemed necessary, in the primary channel to restore hydraulic capacity.

The HEC-RAS model indicates that under existing conditions the freeboard is less than 1-foot along the southern levee for the full length of SMZ 11. The model will be used to evaluate the extents of sediment removal required to restore design capacity in this location, and additional topographic data will be collected in the primary flow channel to better define the potential sediment accumulation. The initial estimate of sediment removal quantities and lengths assumes that sediment removal is required along the full length of SMZ 11.

Figure 13: Sediment and Vegetation at Log Structure 11A, Looking Downstream (Wallace Group, June 2025)

SMZ 12 and 13

Sediment has accumulated throughout SMZ 12 & 13, primarily in the upstream end of SMZ 12. Sediment will be removed to restore hydraulic capacity in this location. As this SMZ is very long, work efforts will be limited to lengths as allowed within the permits, targeting the higher priority locations first.

The HEC-RAS model indicates that under existing conditions the freeboard is less than 1-foot along the southern levee for the majority of SMZ 11, and less than 2-feet along the northern levee with isolated areas of freeboard above 2-feet at the northern levee. The model will be used to evaluate the extents of sediment removal required to restore design capacity in this location. The initial estimate of sediment removal quantities and lengths is based on the maximum allowable length of 500-feet in one year, at the upstream end of the SMZ where freeboard is currently the lowest.

Figure 14: Sediment and Vegetation Buildup at Log Structure 12/13A, Looking Downstream (Wallace Group, June 2025)

SMZ 14

In this location, the primary and secondary channels have switched due to sediment deposition in the primary channel. LiDAR data indicates that the creek has breached the mid-channel bar in multiple locations within this SMZ. Log Structure 14A has experienced minor sediment build-up in and around the structure, and sediment has accumulated in the primary flow channel at the log structure. Sediment will be removed in and around Log Structure 14A to encourage the creek to flow in the intended primary channel.

Log Structure 14B has experienced erosion. The two root wads are both fully exposed, and the footer log appears to be exposed but this could not be confirmed because it was submerged at the last inspection (June 2025). This location may require backfill upstream of the footer logs. Based on log structure monitoring observations, the log structure does not currently provide the original design intent of grade control in this location but does provide habitat value with pool formation and cover in the secondary channel. Proposed work around the log structure will be confirmed with subsequent log structure monitoring prior to planned work in 2026.

Figure 15: Exposed Log Structure and Root Wads at 14B, Looking Upstream (Wallace Group, June 2025)

SMZ 15

Log Structure 15A has experienced significant erosion around the river right footer log and the river right bank. The river right footer log is fully exposed and the adjacent bank has a 5 to 6-foot vertical cut around the root wad. Bank grading and stabilization may be warranted in this location to prevent the erosion cutting from moving further into the bank. The vertical bank itself is not stable; however, the overall slope from the existing eroded toe to top of bank is approximately 2.5H:1V, which is similar to the upstream and downstream existing creek banks.

This location will be monitored for erosion through the 2025-26 rain season to evaluate if bank stabilization is warranted. If the creek toe continues to erode, then bank stabilization may be necessary. If the bank erodes to a stable slope but the toe remains at the current location, then bank stabilization may not be necessary. The log structure itself appears stable but will be monitored in conjunction with the creek bank.

If deemed necessary, an appropriate bank stabilization method will be determined with additional hydraulic modeling for this location. Bank stabilization alternatives may include vegetation-based solutions such as natural fiber erosion control blankets, live staking, or vegetated rock (RSP). If RSP is determined warranted, the plan would include placement of RSP along the stabilized bank and adjacent to the log structure as needed to restore grade with the RSP voids filled with soil and seeded to promote revegetation. As use of RSP for bank

stabilization would be considered a permanent impact not discussed as a typical component of the AGWMP, this activity would require additional agency coordination prior to implementing.

Figure 16: Bank Erosion at 15A, River Right Bank looking upstream (Wallace Group, June 2025)

SMZ 16

SMZ 16 has experienced significant erosion around Log Structure 16A. The primary channel bank on river left is an approximate 4-foot vertical erosion cut. This location may warrant bank grading and stabilization to prevent the erosion cutting from moving further into the bank. The erosion is downstream from a localized narrow point in the creek. There is potential that the bank cutting could migrate upstream during high flows as the creek continues to naturally widen. While the existing vertical cut is not stable, the overall slope from the existing toe to top of bank is approximately 2H:1V, which is similar to up and downstream existing creek bank slopes.

This location will be monitored for erosion through the 2025-26 rain season to evaluate if bank stabilization is warranted. If the creek toe continues to erode, then bank stabilization may be necessary. If the bank erodes to a stable slope but the toe remains at the current location, then bank stabilization may not be necessary. The log structure itself appears stable but should be monitored in conjunction with the creek bank.

If deemed necessary, an appropriate bank stabilization method will be determined with additional hydraulic modeling for this location. Bank stabilization alternatives may include vegetation-based solutions such as natural fiber erosion control blankets, live staking, or

vegetated rock (RSP). If warranted, RSP would be placed along the stabilized bank and adjacent to the log structure as needed to restore grade. RSP voids would be filled with soil to promote revegetation. As use of RSP for bank stabilization would be considered a permanent impact not discussed as a typical component of the AGWMP, this activity would require additional agency coordination prior to implementing.

Figure 17: Bank Erosion at 16A, River Right Bank looking upstream (Wallace Group, June 2025)

At the downstream end of SMZ 16 the creek has breached the riparian buffer and is flowing through the secondary channel. The footer logs of Log Structure16B are undermined, and the creek is flowing underneath the logs. To re-establish the primary channel, sediment will be removed in the primary channel, the mid-channel bar will be re-established, and the grade in the secondary channel upstream of Log Structure 16B will be re-established with fill. Re-establishment of the mid-channel bar will provide an opportunity to establish cottonwood cuttings in the riparian buffer.

Figure 18: Log Structure 16B, Looking Downstream (Wallace Group, June 2025)

SMZ 17

The creek has breached the SMZ 17 mid-channel bar in multiple locations and is actively flowing in both the primary and secondary channels. Grading and placement of fill will be required to repair the mid-channel bar and re-establish the primary channel. The graded area of the mid-channel bar repair will provide an opportunity to establish cottonwood cuttings in the riparian buffer. Reestablishing the primary channel and the adjacent riparian habitat is beneficial to maintaining steelhead habitat within the reach of Arroyo Grande Creek.

Figure 19: Log Structure 17B, Looking Upstream (Wallace Group, June 2025)

SMZ 18

In this location, the primary and secondary channels have switched as a result of sediment deposition in the primary channel and breach of the mid-channel bar in SMZ 18. The sediment in the primary channel is proposed to be excavated in a manner to encourage the creek to return to its previous alignment by realigning low flows to the primary channel, while also restoring the as-built project and re-establishing habitat value.

The realignment of the creek to the primary channel and repair of the scoured mid-channel bar would improve habitat value by reconnecting creek flow to the mature riparian canopy beneficial to maintaining steelhead habitat within the reach of Arroyo Grande Creek. Compared to the current thalweg, the designed primary channel's broader width and mature, well-established riparian vegetation provides superior cover and water temperatures for steelhead.
Sediment was previously removed in the primary channel of SMZ 18 as a part of the 2023 emergency capacity restoration work. The thalweg re-established in the primary channel, then subsequently breached the mid-channel bar and is again flowing in the secondary channel. The mid-channel bar breach is approximately midway between log structures 18A and 18B. It appears that a fallen tree has exacerbated the breach and the secondary channel is scoured and deepened in the vicinity of the mid-bar breach. The District will remove downed limbs, logs, and debris in this area as part of the 2025 vegetation management activity. The bar breach location will be reevaluated following the 2025-26 rain season to determine if additional grading is warranted following the debris removal.

The HEC-RAS model indicates that under existing conditions the freeboard is 2-feet or more through nearly all of SMZ 18, with a small area of the southern (east) levee having less than 2-feet freeboard.

Figure 20: Log Structure 18B, Looking Upstream (Wallace Group, June 2025)

SMZ 19

In this location, the primary and secondary channels have switched as a result of sediment deposition in the primary channel. Sediment removal in the former primary channel is necessary throughout SMZ 19. Based on comparison of the current topographic surface to the 2021 cross section, up to 4-feet of cut would be required to re-establish the primary channel elevation. Successful re-establishment of the primary flow channel may also require removal of sediment and vegetation from the mid-channel bar as well. The bar is currently more than 40-feet wide through the middle of the SMZ. This excessively broad bar feature is limiting the hydraulic capacity of the primary channel and likely is a contributing factor to the thalweg shifting through this location.

Another contributing factor to the channel switch at this location appears to be the existence of a low water crossing at the north end of SMZ 19. In the area of the low water crossing the overall creek channel widens and flattens, slowing flow and causing sediment to drop out at the head of the SMZ 19 primary channel. The attached hydraulic model results at SMZ 19 illustrate the substantial reduction in velocity immediately downstream of the low water crossing. It is likely

that this location will need ongoing maintenance for sediment removal without other modifications to the channel configuration and low water crossing. This location will continue to be monitored for sediment deposition.

Log structure 19A is perched above the current thalweg and sediment has accumulated within the log structure, up to the interior top of the structure where the logs are anchored together. To minimize disruption to the log structure and the riparian buffer, minimal sediment will be removed from immediately underneath the log structure. The intent is that the removal of excess sediment will allow accumulated sediment within the log structure to naturally mobilize during a subsequent storm event.

Figure 21: 19A Log Structure and Secondary Flow Channel, Looking Downstream (Wallace Group, June 2025)

Log structure 19B is undermined and requires backfill to restore its intended function of grade control in the upstream secondary channel. Backfill alternatives will be carefully reviewed for this location. Given the depth of undercutting below the structure more significant backfill may be necessary. One alternative is boulders placed on the upstream side of the footer logs to encourage aggradation in the secondary channel. If rock is used at this location, voids between rocks would be filled with soil to promote vegetation.

Figure 22: 19B Log Structure, Looking Upstream (Wallace Group, June 2025)

A phased approach is recommended at SMZ 19 to remove sediment in the designed primary channel first, then divert the creek back into the primary channel. Following successful diversion, the backfill work would be performed in the secondary channel.

PRIORITY RANKING FOR MAINTENANCE AREAS

Each of the identified maintenance areas have been assigned a priority based on habitat and flood risk objectives.

Flood risk was determined from the HEC-RAS model, and ranked as follows:

Flood Risk Ranking	
Low	Freeboard is 2-foot or greater
Medium	Freeboard is between 1 and 2-foot
High	Freeboard is less than 1-foot

Habitat value was ranked based on qualitative observations and quantitative log structure monitoring, accounting for the log structure shelter rating assigned in accordance with the California Salmonid Stream Habitat Restoration Manual, Part III Habitat Inventory Methods (CDFW 2010). Habitat priority is ranked as follows:

Habitat Ranking	
Low	High quality habitat
Medium	Habitat provides some value, but could be improved
High	Degraded or lacking habitat

The highest assigned priority for either flood risk or habitat was used as the priority ranking for the maintenance area.

A summary of work areas and assigned priority rankings is shown in the table on the following page.

			Priority Ranking		
SMZ ID	Log Structure	Proposed Work	Habitat Value	Flood Risk	Ranking
1	1A	Remove sediment in secondary channel	Medium	Low	Medium
2	2A	Remove sediment in secondary channel	Medium	High	High
3	3A	Remove sediment in and around log structure, and within secondary channel	Medium	High	High
3	3B	Backfill erosion upstream of log structure	Low	High	High
5	N/A	Remove sediment in secondary channel	Low	High	High
7	N/A	Stabilize levee breach site	High	High	High
7	N/A	Remove sediment in secondary channel	Low	High	High
8	8A	Remove sediment in secondary channel	Low	Medium	Medium
9	9B	Remove sediment in secondary channel and downstream of log structure	Medium	High	High
11	11A	Remove sediment in and around log structure, and within secondary channel	Medium	High	High
12 & 13	N/A	Remove sediment in secondary channel	Low	High	High
14	14A	Remove sediment in and around log structure, and within secondary channel	Medium	High	High
14	14B	Backfill erosion upstream of log structure	Medium	Medium	Medium
15	15A	Bank stabilization adjacent to log structure	Low	Medium	Medium
16	16A	Bank stabilization adjancent to log structure	Low	Low	Low
16	16B	Remove sediment in primary channel	Medium	Low	Medium
16	16B	Repair breach in mid-channel bar, backfill erosion upstream of log structure	Low	Low	Low
17	17B	Repair multiple breaches in mid-channel bar	Medium	Medium	Medium
18	18B	Repair breach in mid-channel bar, backfill erosion upstream of log structure	High	Medium	High
19	19A	Remove sediment in primary channel	High	Low	High
19	19B	Backfill erosion upstream of log structure	Medium	Low	Medium

SUMMARY OF PROPOSED SEDIMENT REMOVAL AND LOG STRUCTURE MAINTENANCE

SMZ ID	Log Structure & Alcove	Proposed Work	Work Year	Approximate Length (ft)	Approximate Volume (CY)	Volume Type	Priority Ranking
1	1A	Remove sediment in and around log structure, and within secondary channel	2026+	40	60	Cut	Medium
2	2A	Remove sediment in and around log structure, and within secondary channel	2026+	50	50	Cut	High
3	3A	Remove sediment in and around log structure, and within secondary chanenl	2026+	150	50	Cut	High
3	3B	Backfill erosion upstream of log structure	2026+	50	40	Fill	High
5	N/A	Remove sediment in secondary channel	2026+	175	180	Cut	High
7	N/A	Stabilize levee breach site	2025	115	205	Fill	High
7	N/A	Remove sediment in secondary channel	2025	190	300	Cut	High
8	8A	Remove sediment in and around log structure, and within secondary channel	2026+	170	90	Cut	Medium
9	9B	Remove sediment in secondary channel and downstream of log structure	2026+	175	80	Cut	High
11	11A	Remove sediment in and around log structure, and within secondary chanenl	2026+	200	110	Cut	High
12 & 13	N/A	Remove sediment in secondary channel	2026+	500	200	Cut	High
14	14A	Remove sediment in and around log structure, and within original primary channel	2026+	140	100	Cut	High
14	14B	Backfill erosion upstream of log structure	2026+	60	80	Fill	Medium
15	15A	Bank stabilization adjacent to log structure	2026+	100	150	Cut/Fill	Medium
16	16A	Bank stabilization adjancent to log structure	2026+	100	150	Cut/Fill	Low
16	16B	Remove sediment in primary channel	2026+	90	100	Cut	Medium
16	16B	Repair breach in mid-channel bar, backfill erosion upstream of log structure	2026+	70	175	Fill	Low
17	17B	Repair multiple breaches in mid-channel bar	2026+	500	400	Fill	Medium
18	18B	Repair breach in mid-channel bar, backfill erosion upstream of log structure	2026+	200	200	Fill	High
19	19A	Remove sediment in primary channel	2026+	280	600	Cut	High
19	19B	Backfill erosion upstream of log structure	2026+	80	100	Fill	Medium
		Totals for 2025		**305**	**505**	**Cut + Fill**	
		Totals for 2026+		**3,130**	**2,915**	**Cut + Fill**	

NOTE: Length and volume for work proposed in 2025 is based on engineering drawings. All other lengths and volumes are approximate to be refined with subsequent engineering design.

ATTACHMENTS

2025 HEC-RAS Model Results

UPRR Breach Site Stabilization Project Plans

AGWMP Diversion and Dewatering Plan (updated 2025)

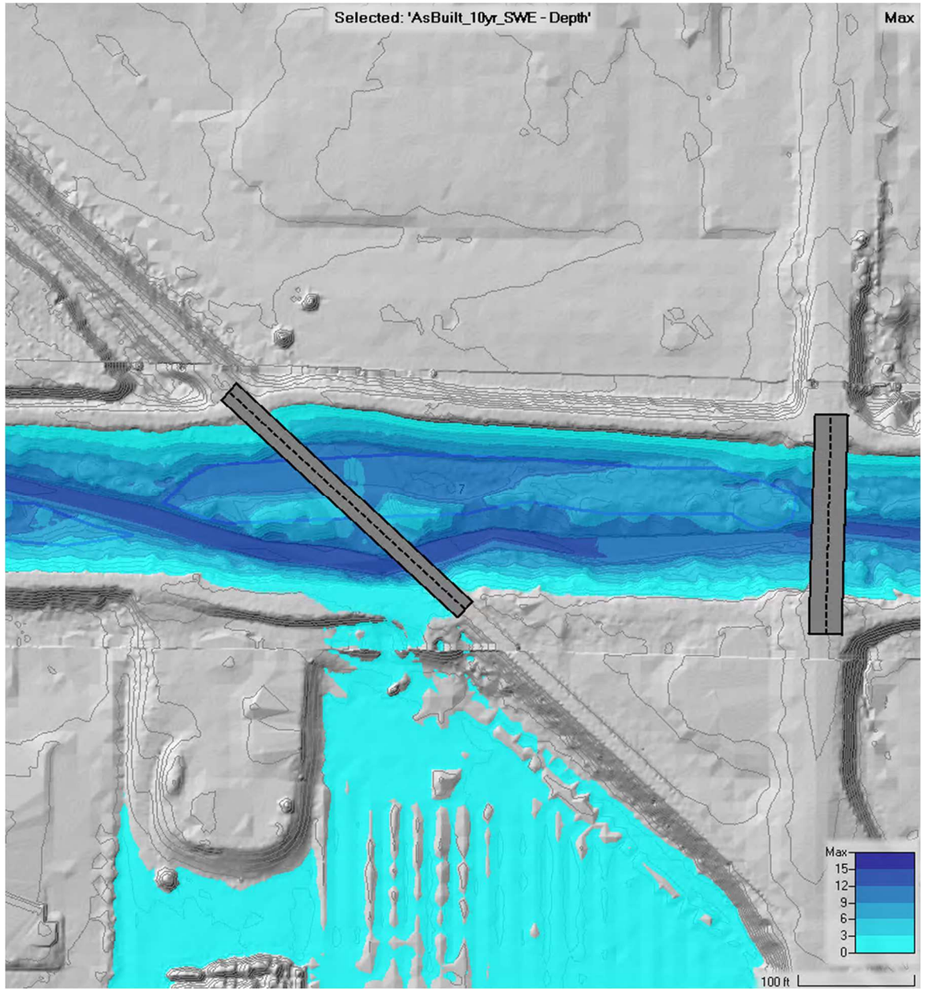
AGWMP Fish Removal and Rescue Plan

Arroyo Grande Creek Waterway Management Plan
WG Project No. 0019-0118

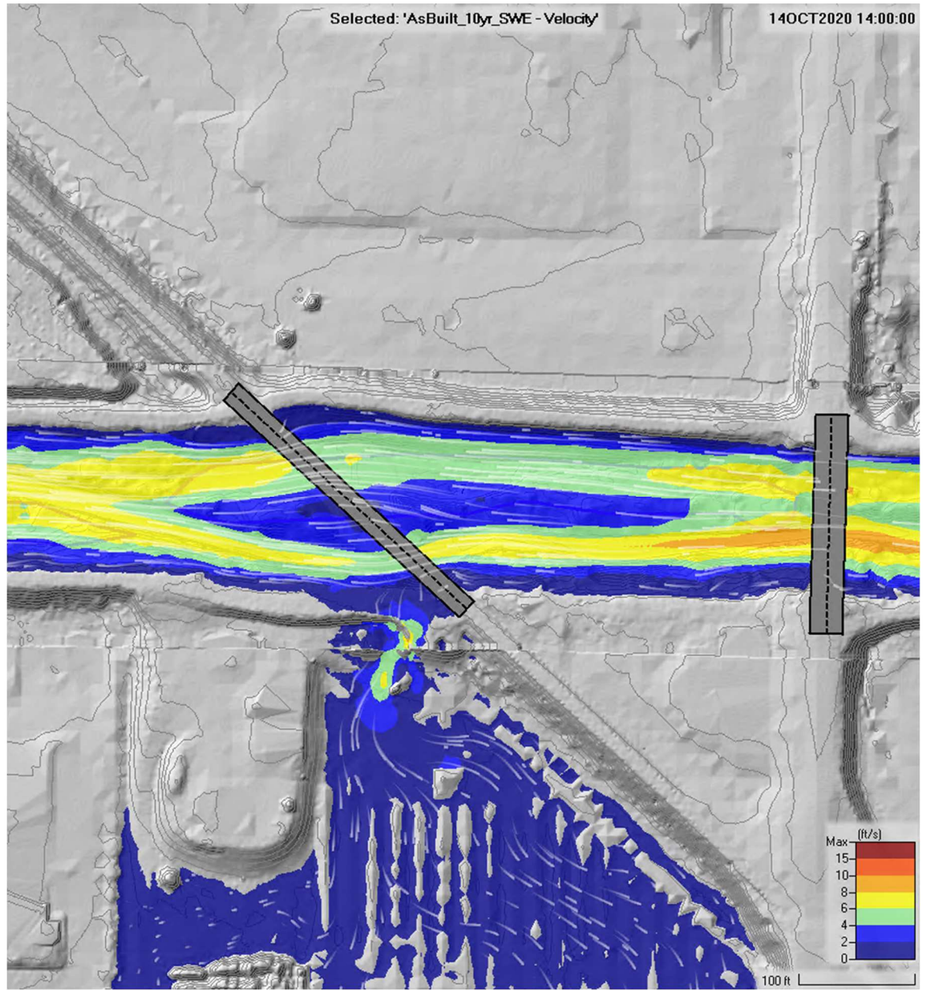
HEC-RAS MODEL RESULTS (2025-07-30 MODEL RUN, SWE CALCULATION SET)

SMZ 7/UPRR Bridge:

10-year Maximum Depth, Existing (ft):



10-year Maximum Velocity, Existing (fps)



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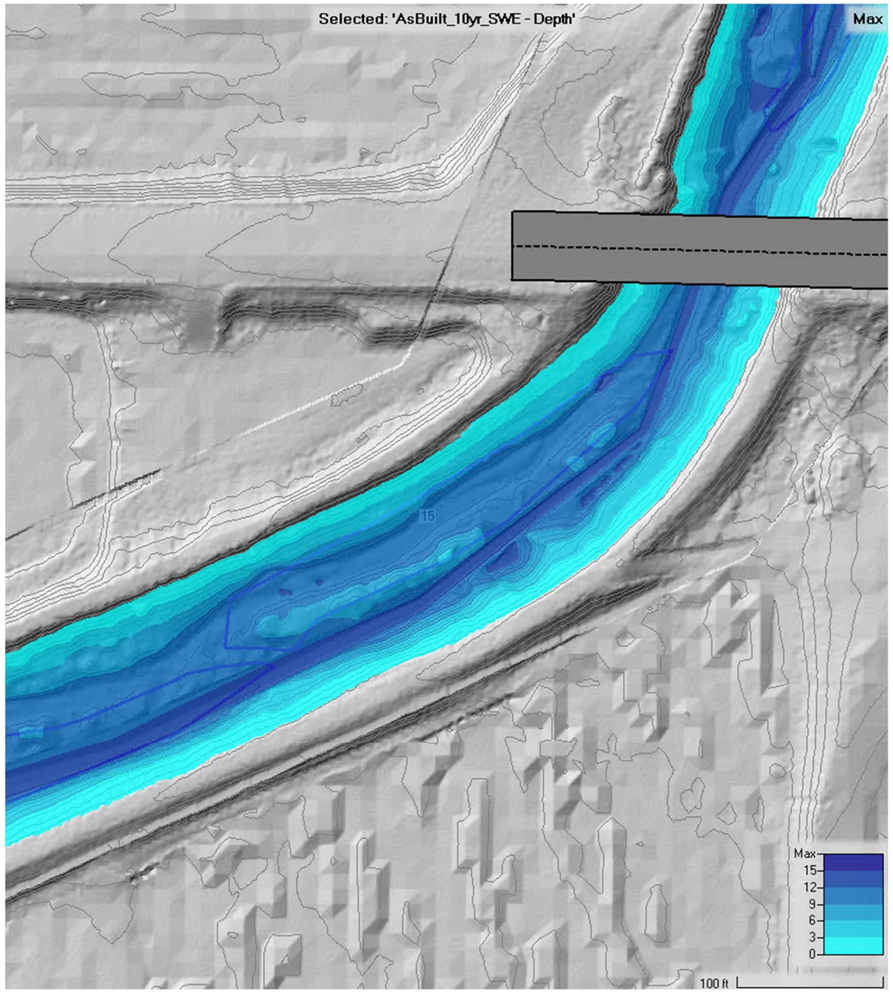
SMZ 7/UPRR Bridge:

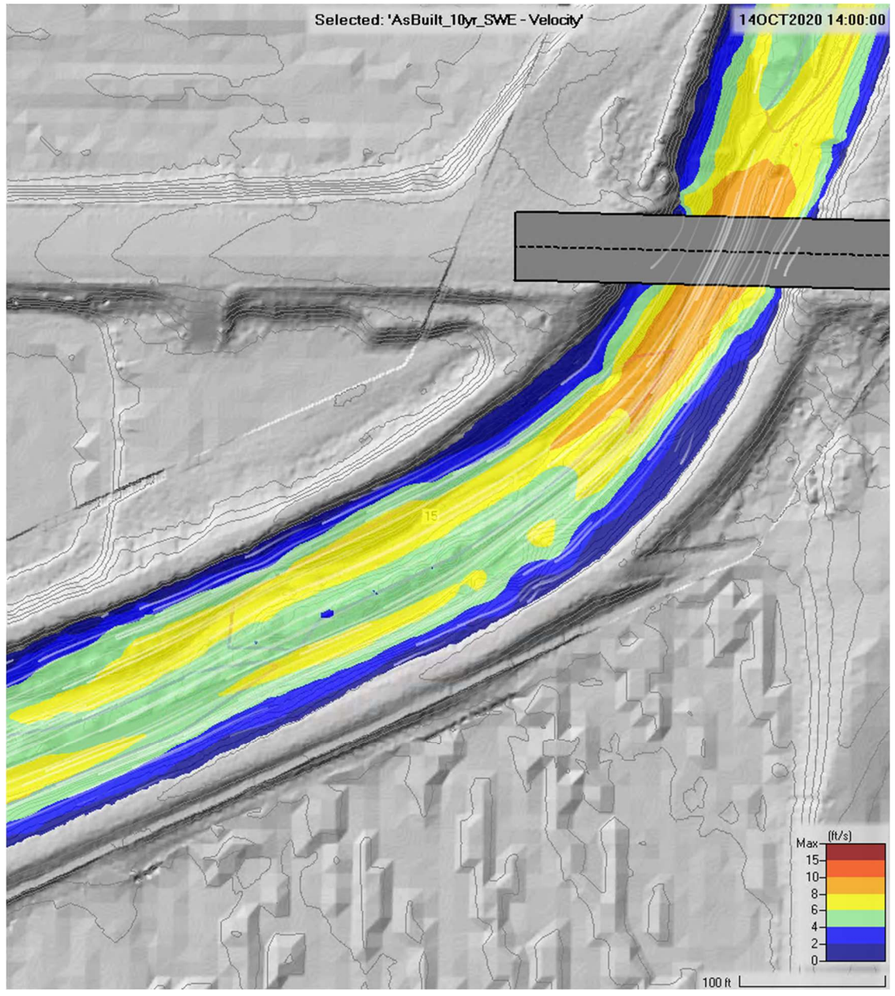
10-year Maximum WSE, Existing (ft):

SMZ 15, Hwy 1 Bridge:

10-year Maximum Depth, Existing (ft):



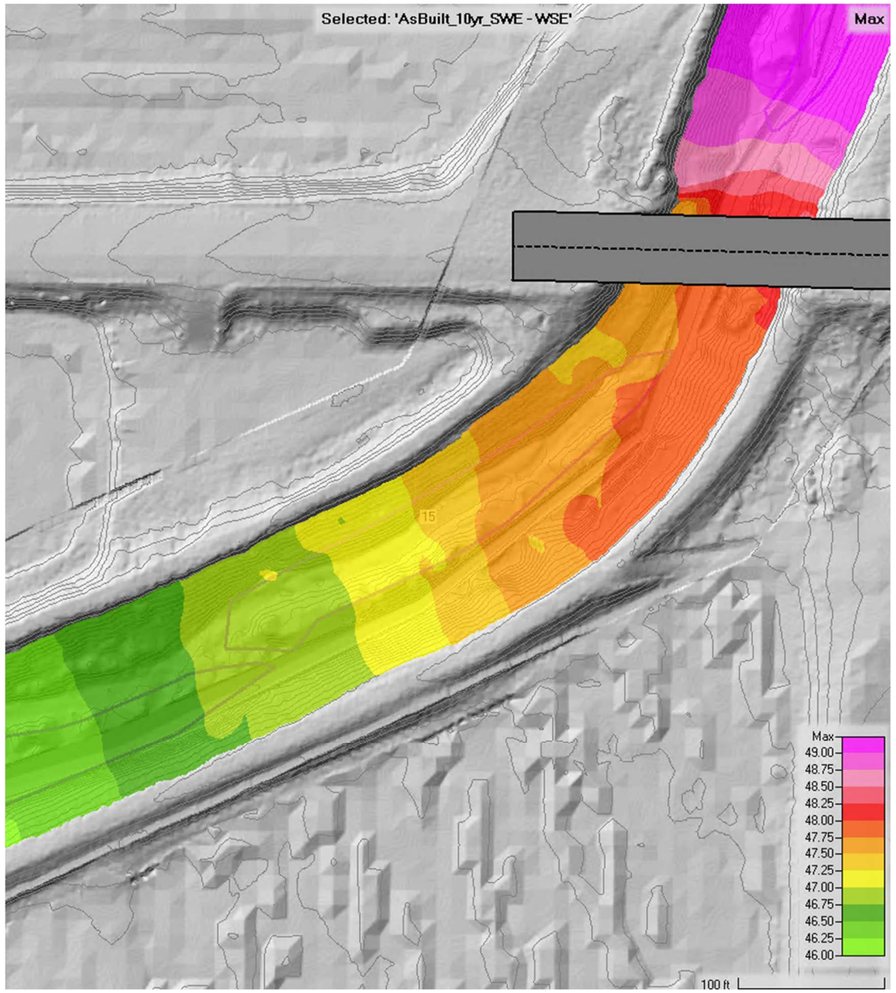
10-year Maximum Velocity, Existing (fps):



Notes: SMZ 15 is immediately downstream of the Hwy 1 Bridge.

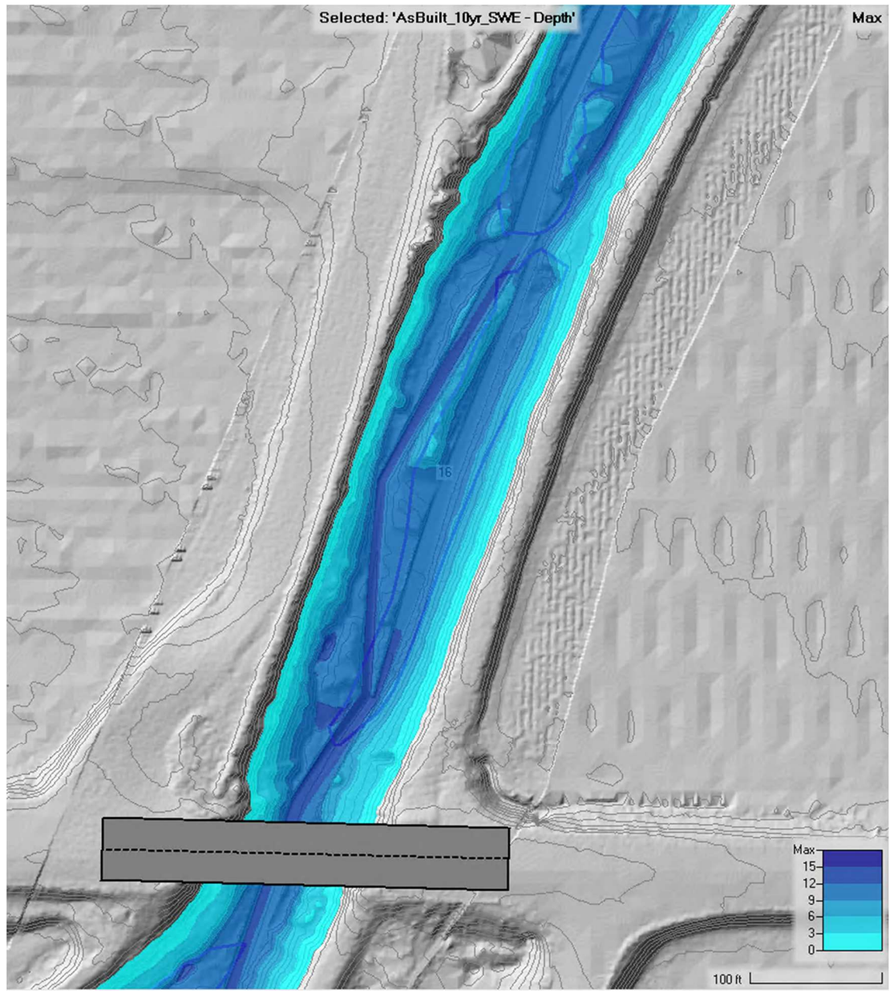
SMZ 15, Hwy 1 Bridge:

10-year Maximum WSE, Existing (ft):

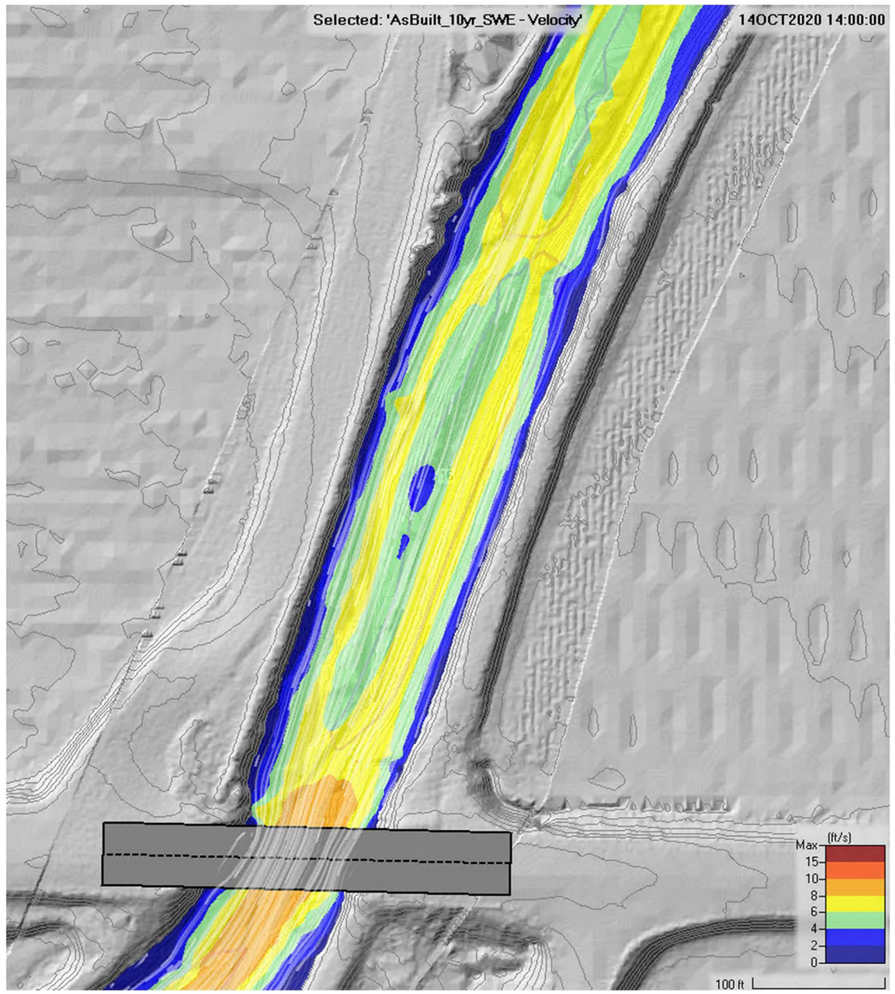


SMZ 16, Hwy 1 Bridge:

10-year Maximum Depth, Existing (ft):



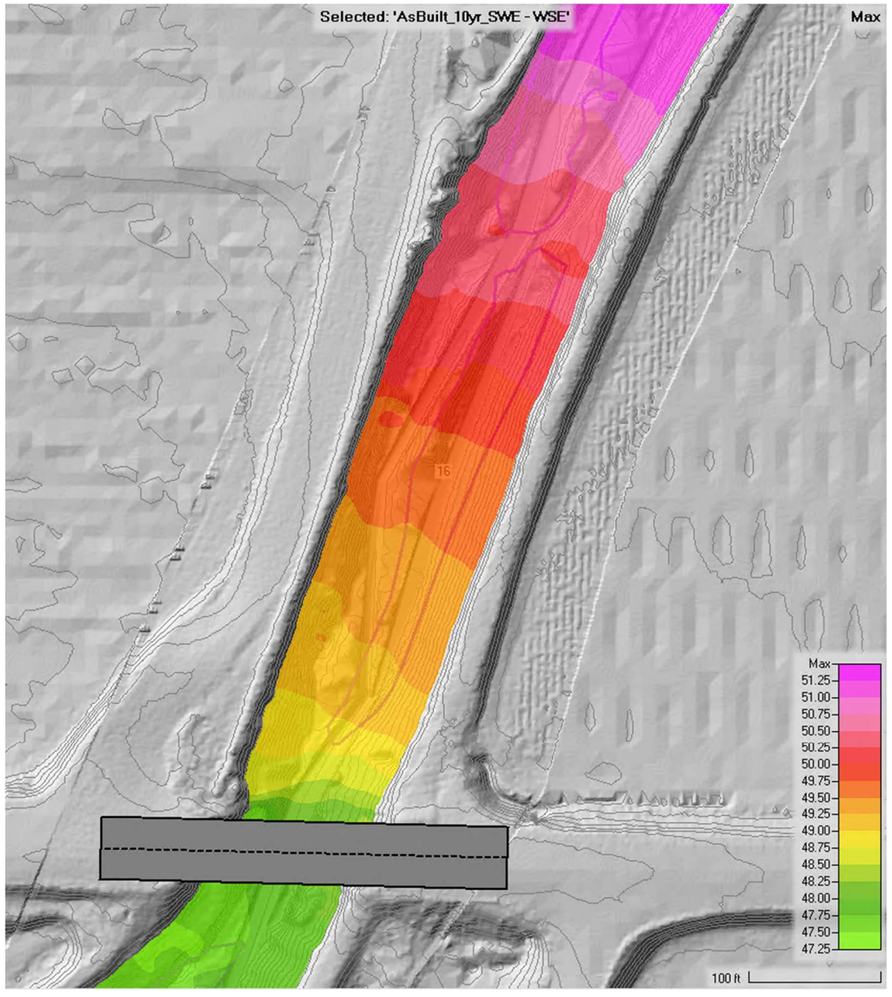
10-year Maximum Velocity, Existing (fps):



Notes: SMZ 16 is immediately upstream of the Hwy 1 Bridge.

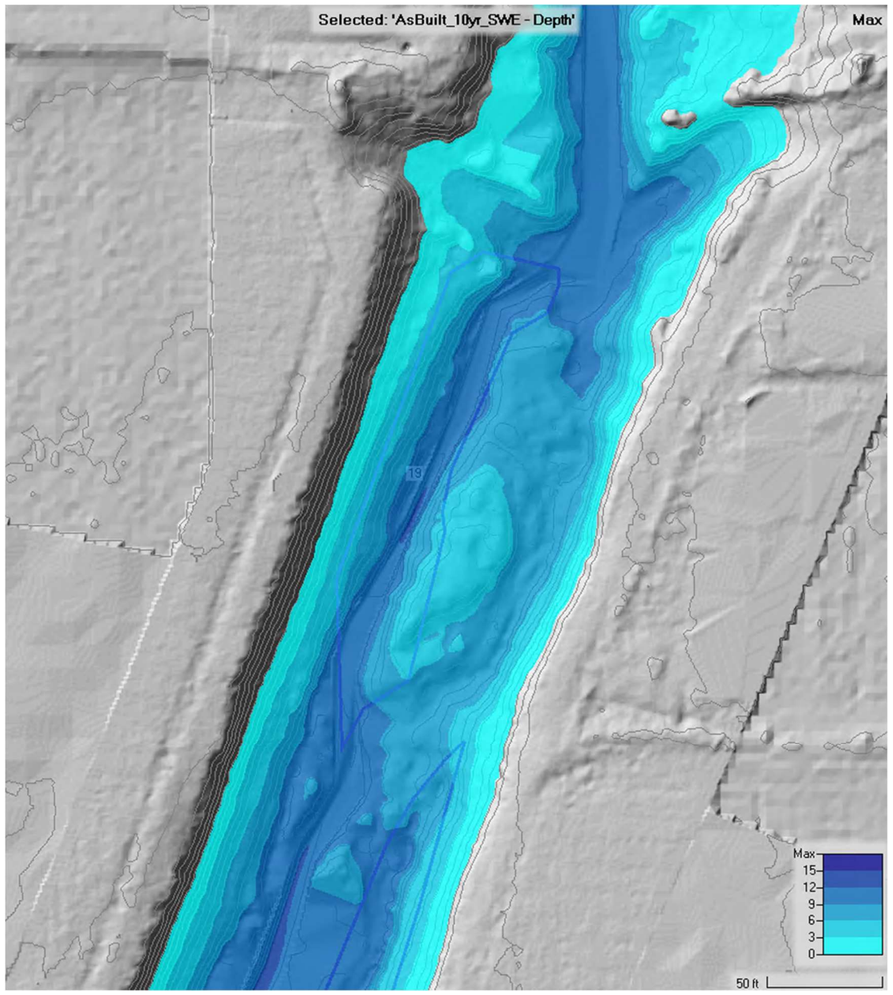
SMZ 16, Hwy 1 Bridge:

10-year Maximum WSE, Existing (ft):

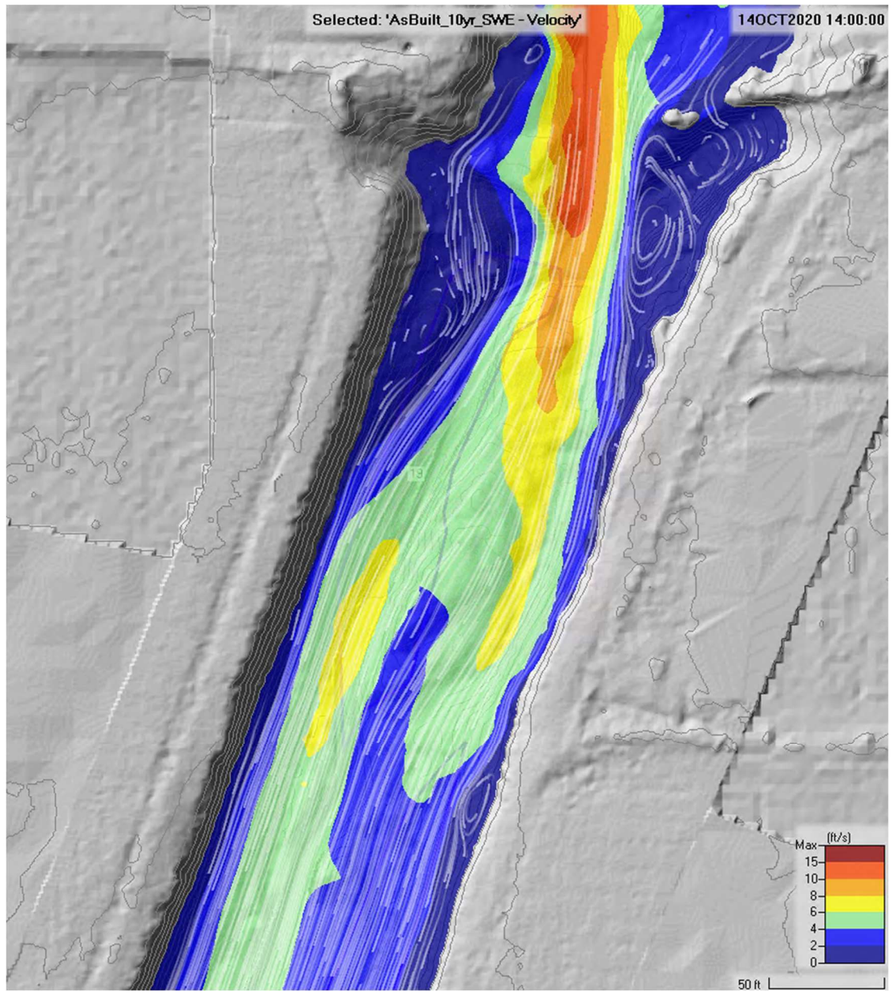


SMZ 19:

10-year Maximum Depth, Existing (ft):

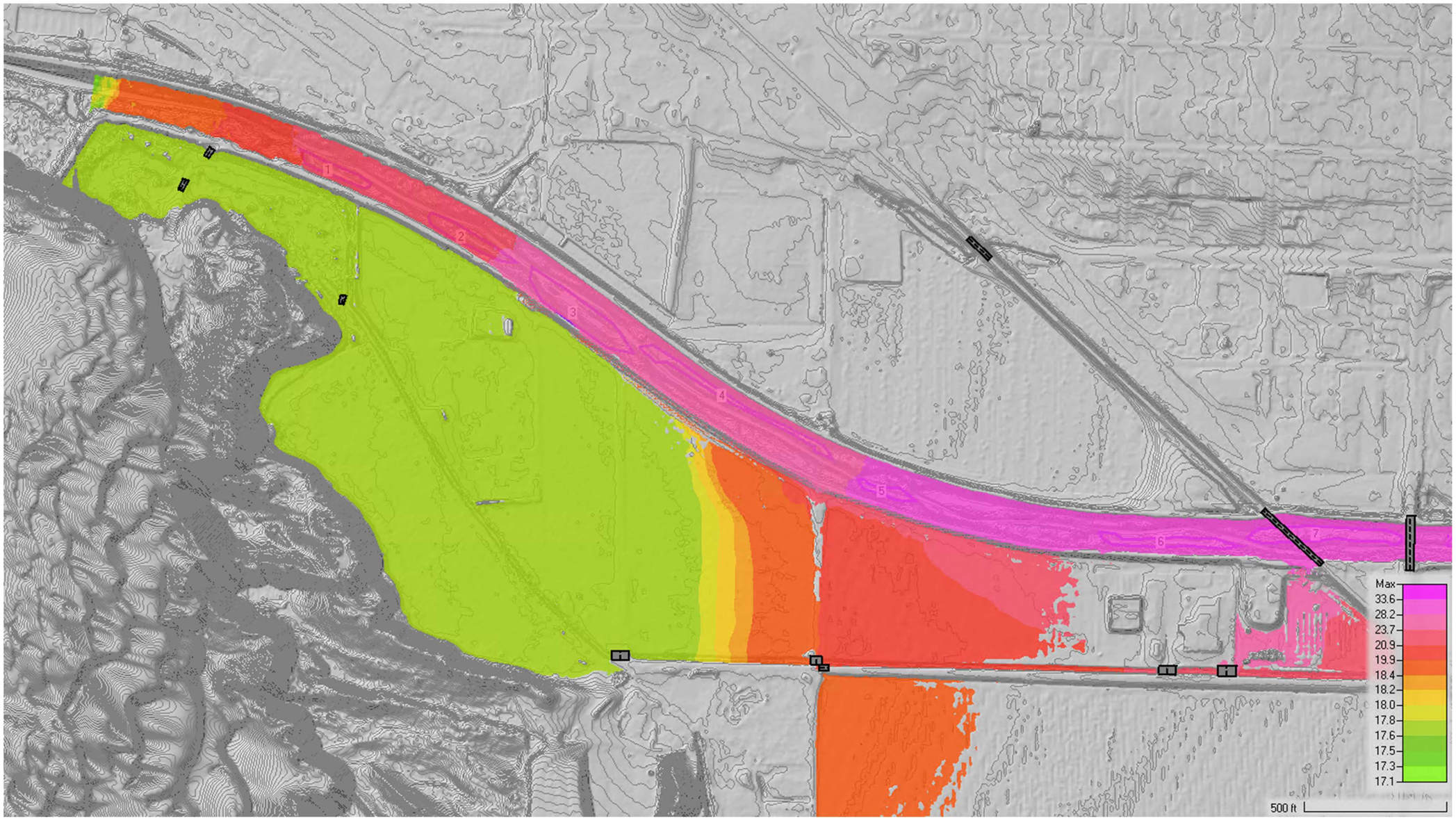


10-year Maximum Velocity, Existing (fps):

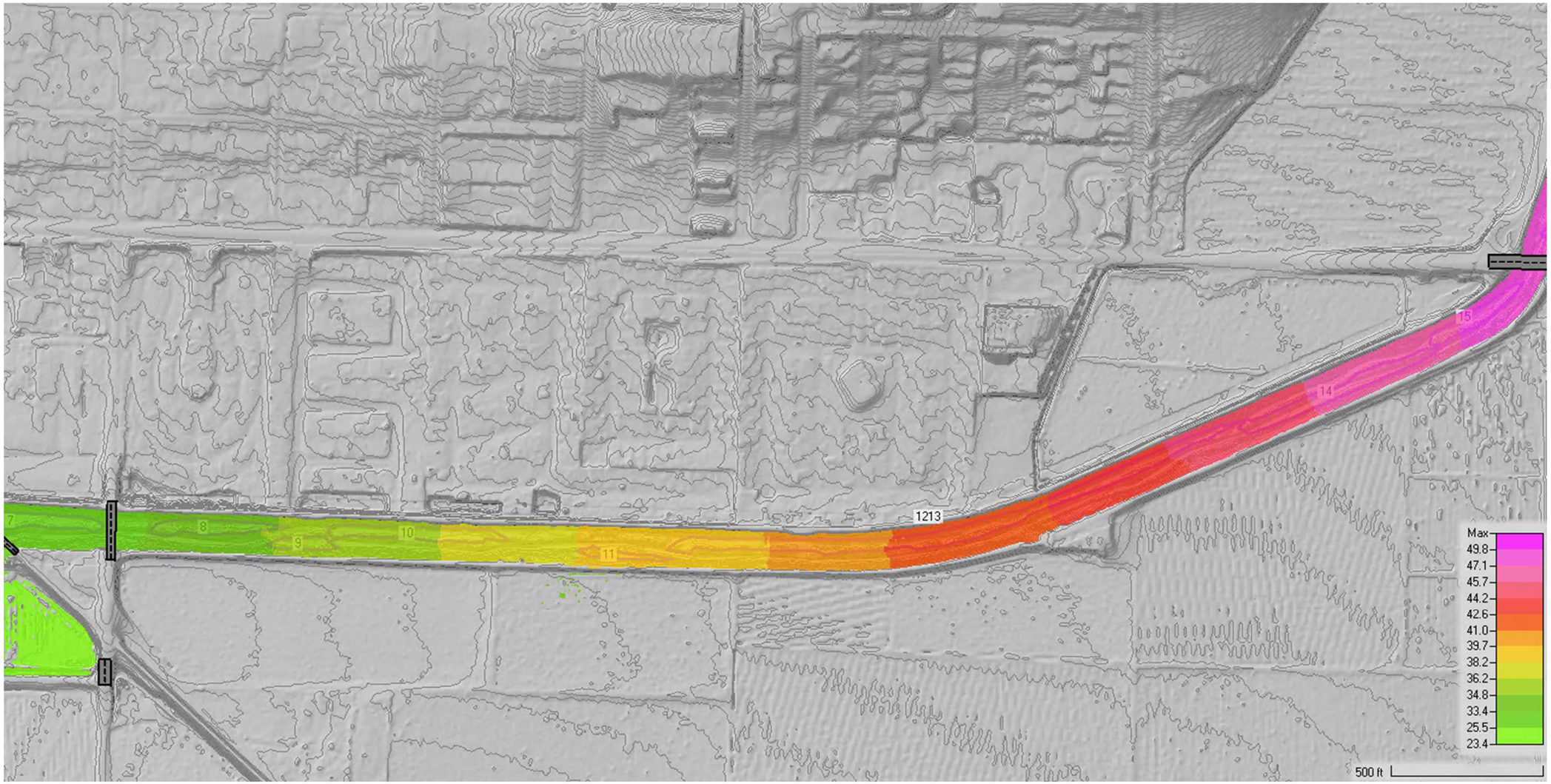


Notes: model indicates decrease in velocity at upstream end of SMZ 19 in location of low water crossing

10-year Existing Conditions Maximum Water Surface Elevations, SMZ 1 to SMZ 7 (ft):

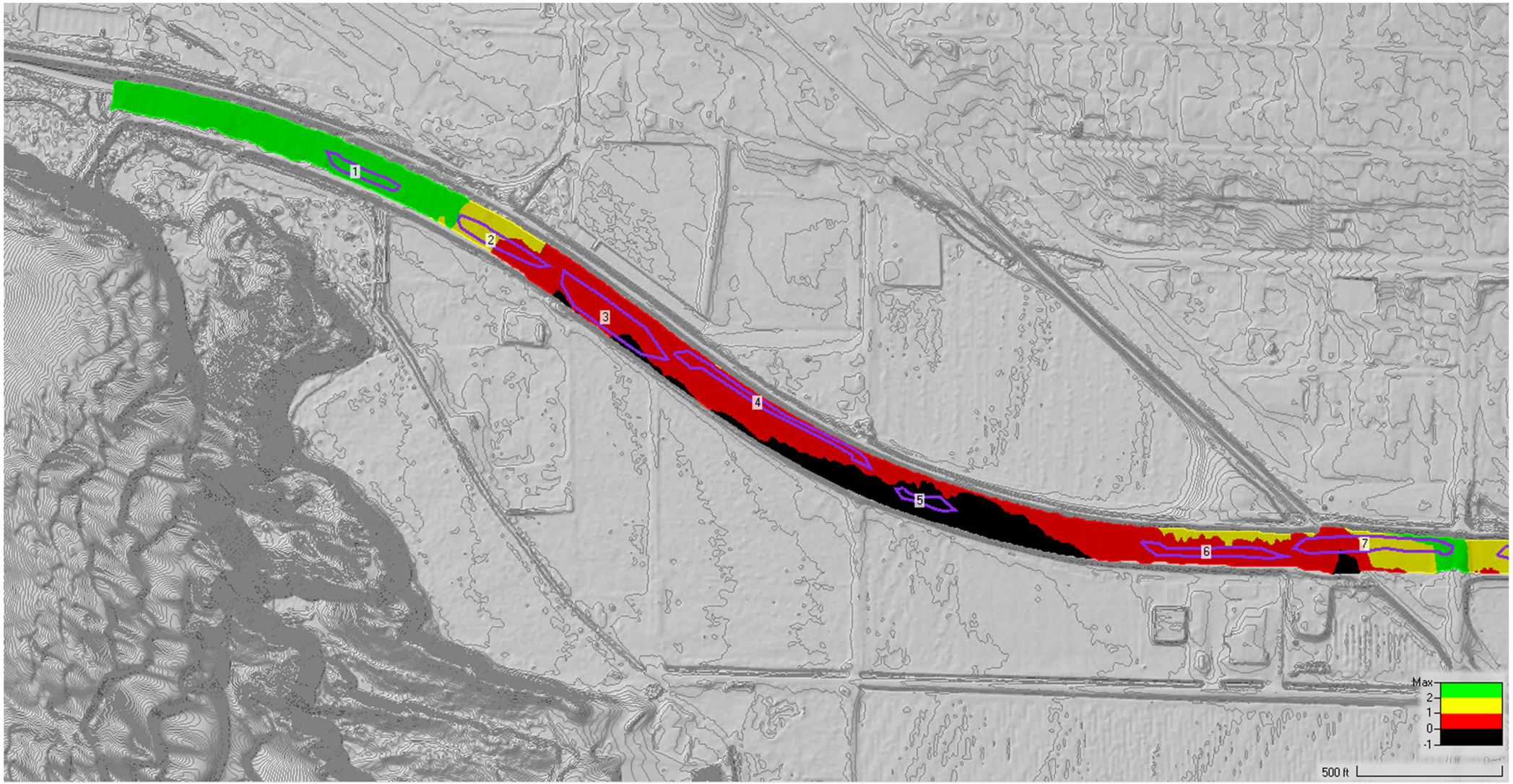


10-year Existing Conditions Maximum Water Surface Elevations, SMZ 8 to SMZ 15 (ft):



10-year Existing Conditions Maximum Water Surface Elevations, SMZ 16 to SMZ 22 (ft):

10-year Existing Conditions Freeboard, SMZ 1 to SMZ 7 (ft):

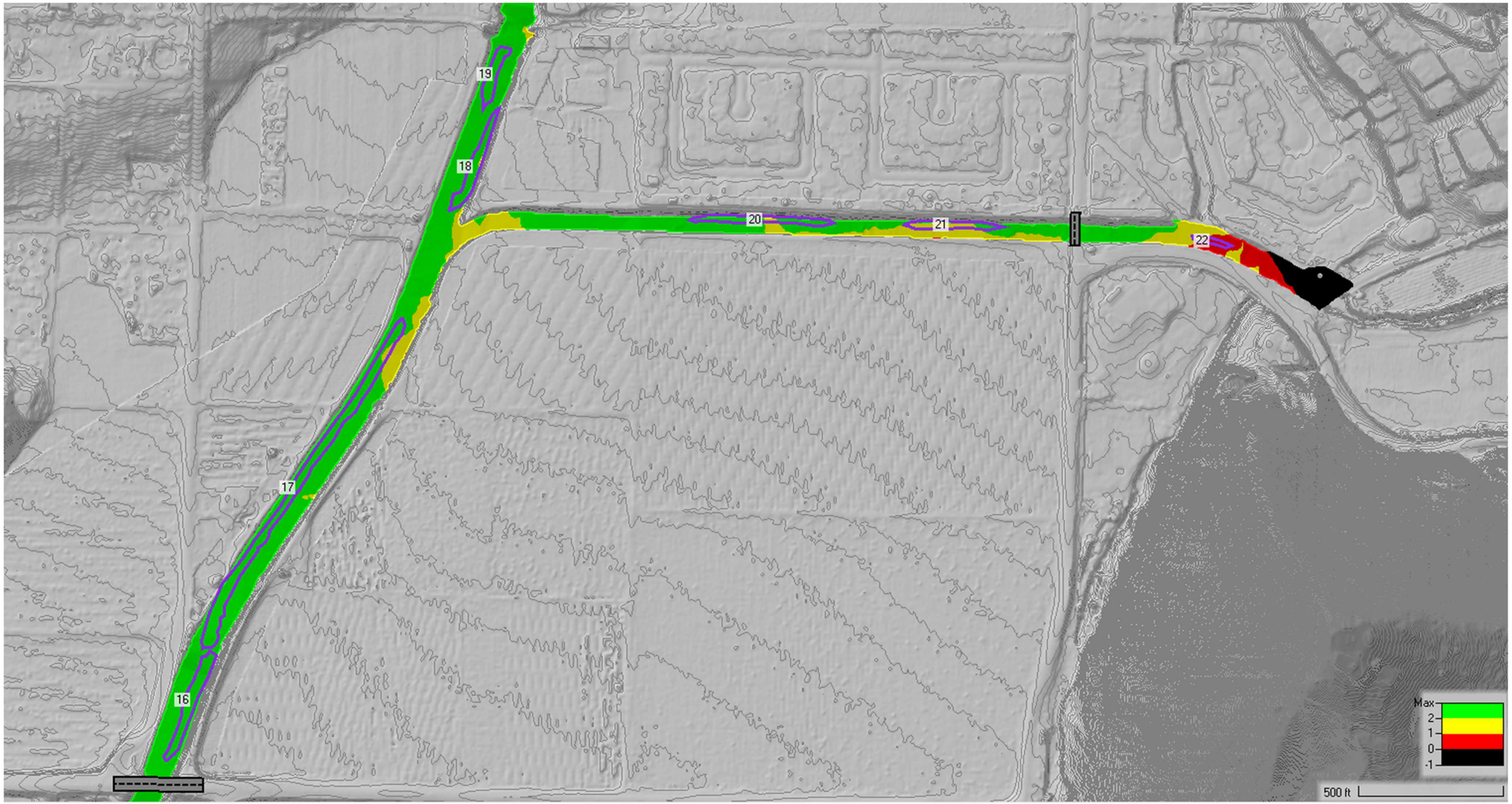


Notes: Black shading indicates locations of overtopping

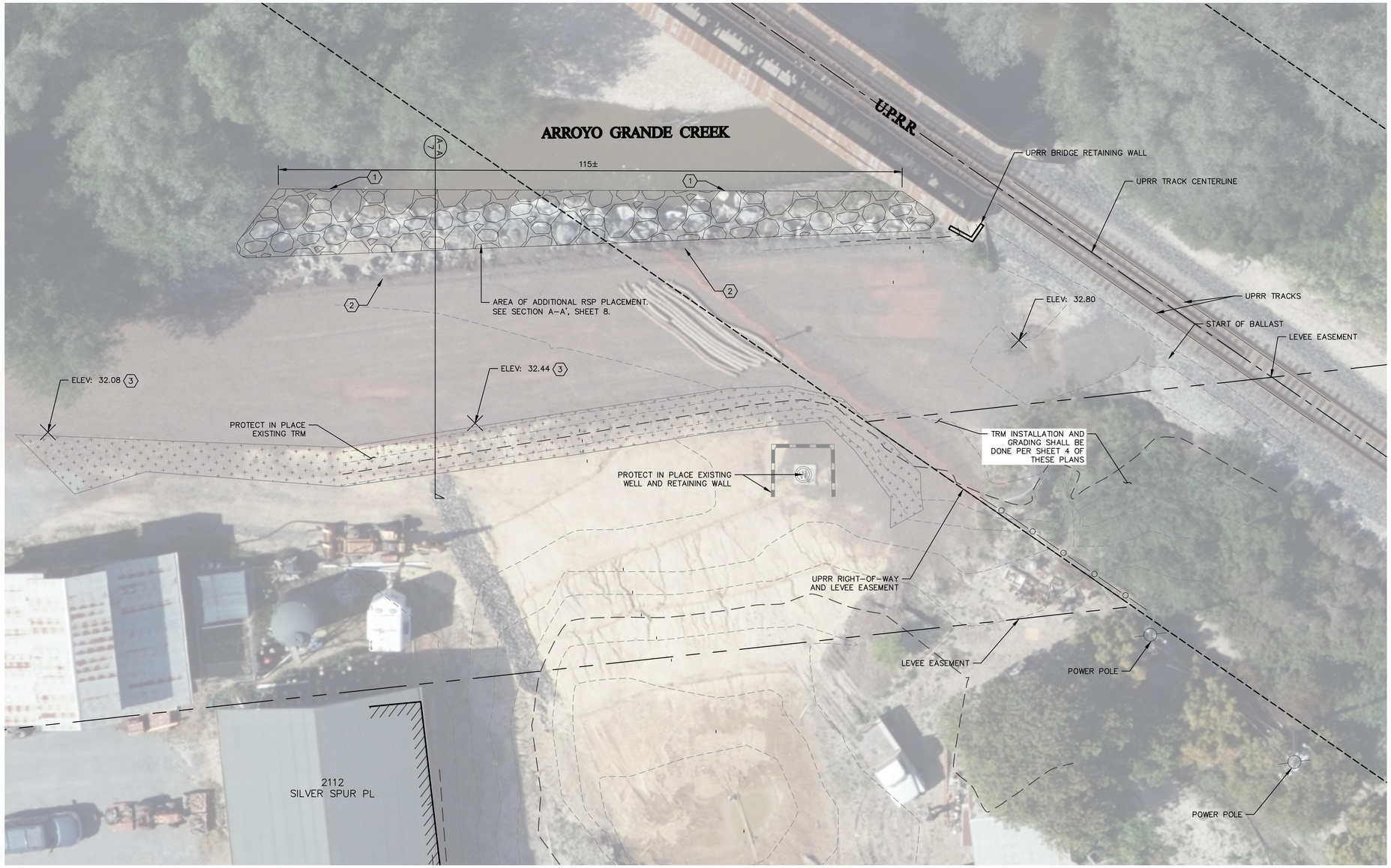
10-year Existing Conditions Freeboard, SMZ 8 to SMZ 15 (ft):

Notes: Black shading indicates locations of overtopping

10-year Existing Conditions Freeboard, SMZ 16 to SMZ 22 (ft):



Notes. Black shading indicates locations of overtopping



LEVEE IMPROVEMENTS – RSP

SCALE HORIZ 1" = 10'

LEGEND:

- UPRR RIGHT–OF–WAY
- EXISTING TRM (TURF REINFORCEMENT MAT)
- INSTALL RSP (ROCK SLOPE PROTECTION)
- AG LEVEE EASEMENT LINE

NOTES:

1. AERIAL PHOTO DATE: MAY 2023

CONSTRUCTION NOTES:

1. LOWER LIMITS OF EXISTING ROCK SLOPE PROTECTION (RSP) AND ADDITIONAL RSP PLACEMENT.
2. UPPER LIMITS OF EXISTING ROCK SLOPE PROTECTION (RSP).
3. RESTORE TOP OF LEVEE ELEVATIONS TO PRE–CONSTRUCTION/DESIGN ELEVATIONS AS NECESSARY.

CALL BEFORE YOU DIG USA 811

0 10 20

1 INCH = 10 FEET

REV. NO	DATE	REVISED	REV. BY	CKD. BY	APPRD BY
1	8/14/24	AG CREEK – DEWATERING PLAN REVISION	NS	LK	

DESTROY ALL PRINTS BEARING EARLIER DATE

Cannon

1050 Southwood Drive
San Luis Obispo, CA 93401
P 805.544.7497 F 805.544.3863

DRAWN BY NS
CHECKED BY LK
DATE 8/14/2024
SCALE AS SHOWN
CA JOB NO. 230113

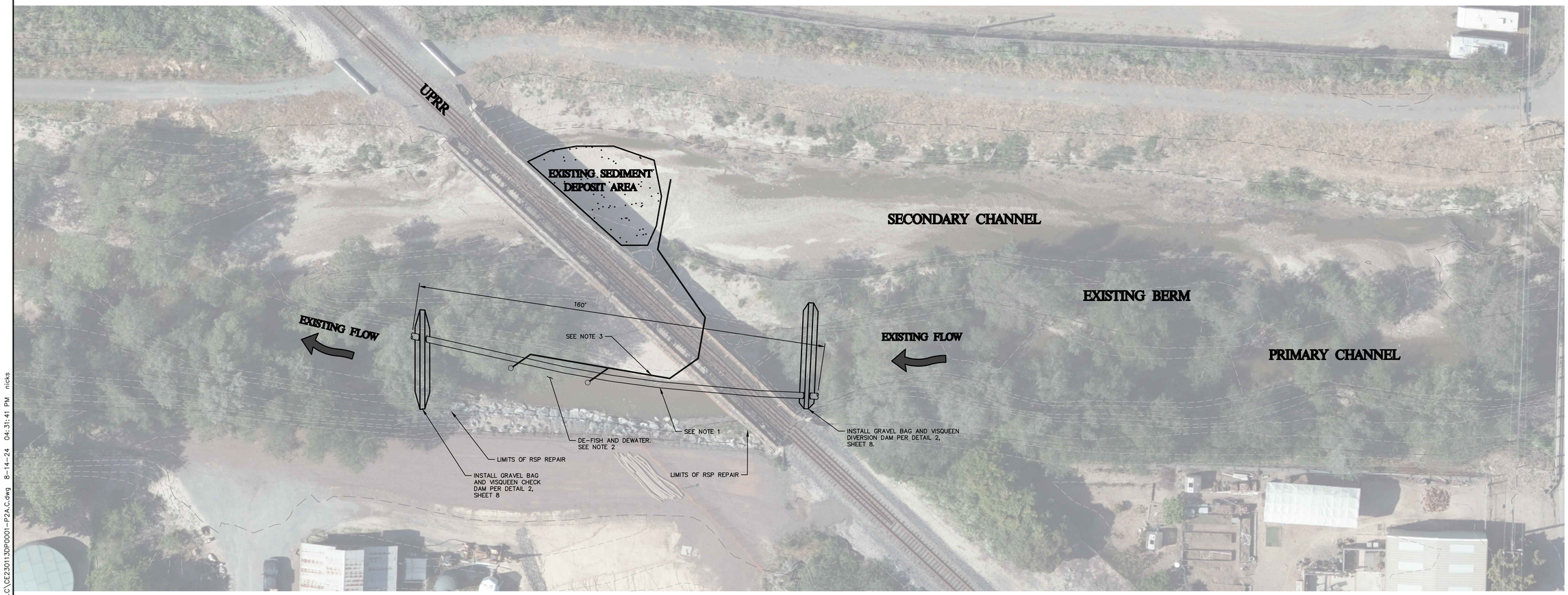
REGISTERED PROFESSIONAL ENGINEER
JOHN W. EVANS, SR.
NO. 54105
EXP. 12/31/25
CIVIL
STATE OF CALIFORNIA

ARROYO GRANDE CREEK CHANNEL UPRR AREA ADDITIVE TRM AND BREACH SITE STABILIZATION PROJECT
SAN LUIS OBISPO COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

6 – LEVEE IMPROVEMENTS – RSP

OCEANO, CALIFORNIA

SHEET 6 OF 8



DEWATERING EXHIBIT

SCALE: 1"=20'

NOTES:

1. INSTALL 30" DIAMETER HDPE DIVERSION PIPE BETWEEN THE CHECK DAMS. DIVERSION PIPE SLOPE IS TO BE 0.25 % MINIMUM. ANCHOR DIVERSION PIPE PER MANUFACTURER'S RECOMMENDATIONS AT 25' OC.
2. FOLLOWING DAM AND DIVERSION PIPE INSTALLATION, DAMMED AREAS SHALL BE DE-FISHED AND DEWATERED. PUMPED WATER SHALL BE DISCHARGED IN THE SECONDARY CHANNEL, UPSTREAM OF THE EXISTING SEDIMENT DEPOSIT AREA.
3. INSTALL SUMP PUMP(S) AND DISCHARGE LINE(S) IN RSP PLACEMENT AREA(S). OPERATE PUMPS ON AN AS-NEEDED BASIS DURING WORK HOURS AND PRIOR TO ADDITIONAL RSP PLACEMENT.

0 20 40

1 INCH = 20 FEET

REV. NO	DATE	REVISED	REV. BY	CKD. BY	APPRD BY
		DESTROY ALL PRINTS BEARING EARLIER DATE			
1	8/14/24	AG CREEK - DEWATERING PLAN REVISION	NS	LK	

Cannon

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San Luis Obispo, CA 93401
P 805.544.7497 F 805.544.3863

DATE 8/14/2024
SCALE AS SHOWN
CA JOB NO. 230113
DRAWN BY NS
CHECKED BY LK

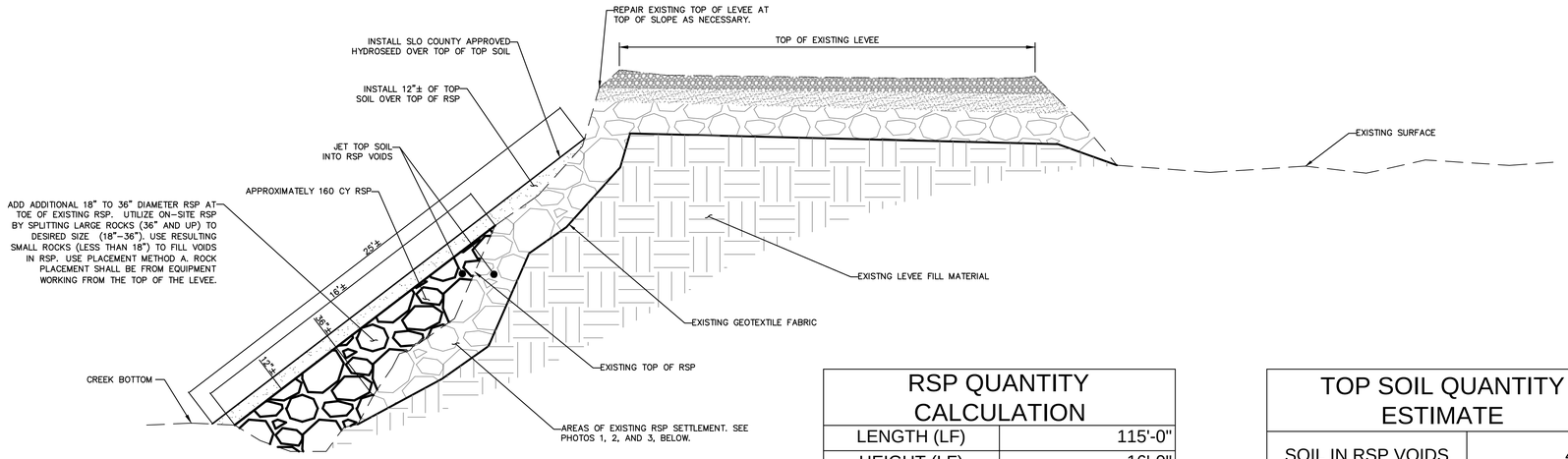
REGISTERED PROFESSIONAL ENGINEER
JOHN W. EVANS SR.
NO. 54105
EXP. 12/31/25
CIVIL
STATE OF CALIFORNIA

ARROYO GRANDE CREEK CHANNEL UPRR AREA ADDITIVE TRM AND BREACH SITE STABILIZATION PROJECT
SAN LUIS OBISPO COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

DEWATERING PLAN

OCEANO, CALIFORNIA

SHEET 7 OF 8

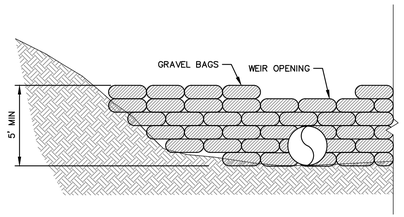


RSP QUANTITY CALCULATION	
LENGTH (LF)	115'-0"
HEIGHT (LF)	16'-0"
THICKNESS (LF)	3'-0"
VOLUME (CY)	205 CY

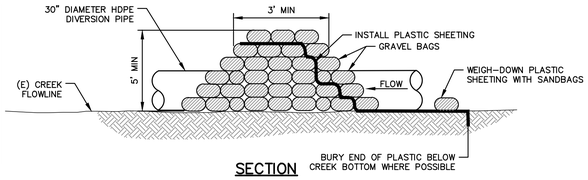
TOP SOIL QUANTITY ESTIMATE	
SOIL IN RSP VOIDS	40 CY
SOIL ON TOP OF RSP	90 CY

GRAVEL BAG NOTES

1. TEMPORARY DEWATERING FACILITIES SHALL BE IN PLACE PRIOR TO INITIATION OF SLOPE REPAIR WORK.
2. PRIOR TO REMOVING DEWATERING FACILITIES OR RELEASING WATER TO THE PROJECT AREA, ALL BANK PROTECTION, SHALL BE COMPLETE.
3. UPON COMPLETION OF THE PROJECT, ALL MATERIAL USED IN THE TEMPORARY DIVERSION SHALL BE REMOVED FROM THE SITE.
4. NUMBER OF BAGS AND ARRANGEMENT MAY VARY WITH ON-SITE CONDITIONS.



ELEVATION



SECTION

LEVEE SECTION A – A' (1)
SHEET 4 N.T.S.

TEMPORARY GRAVEL BAG INLET OR OUTLET CHECK DAM (2)
SHEET 7 N.T.S.

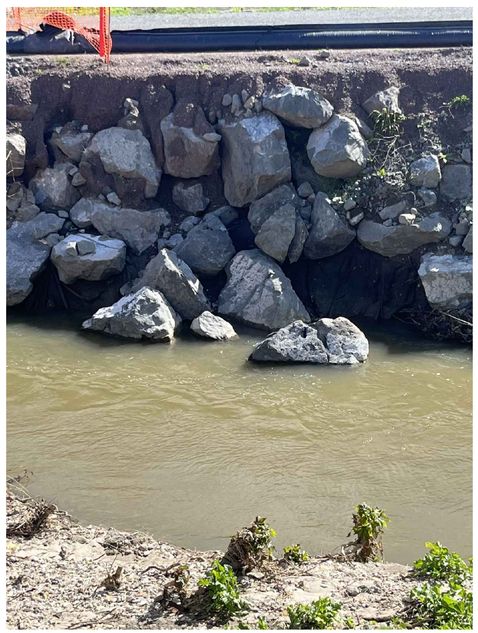


PHOTO (1)
SHEET #

PHOTO (2)
SHEET #

PHOTO (3)
SHEET #

REV. NO	DATE	REVISED	REV. BY	CKD. BY	APPRD BY
		DESTROY ALL PRINTS BEARING EARLIER DATE			
1	8/14/24	AG CREEK – DEWATERING PLAN REVISION	NS	LK	

Cannon
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DATE 8/14/2024
SCALE AS SHOWN
CA JOB NO. 230113
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CHECKED BY LK

REGISTERED PROFESSIONAL ENGINEER
JOHN W. EVANS SR.
NO. 54105
EXP. 12/31/25
CIVIL
STATE OF CALIFORNIA

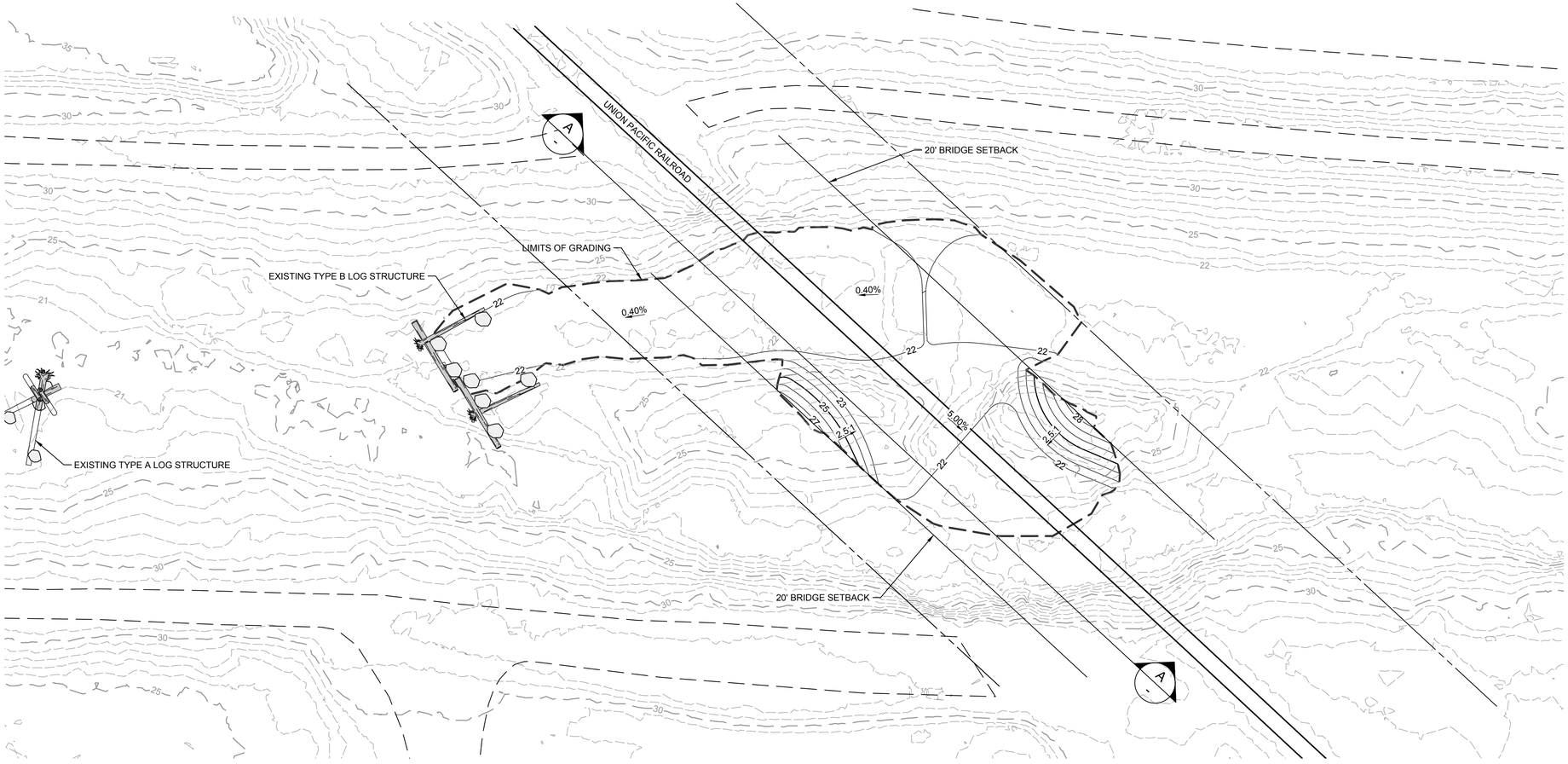
ARROYO GRANDE CREEK CHANNEL UPPR AREA, ADDITIVE TRM AND BRECKEY SITE STABILIZATION PROJECT
SAN LUIS OBISPO COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

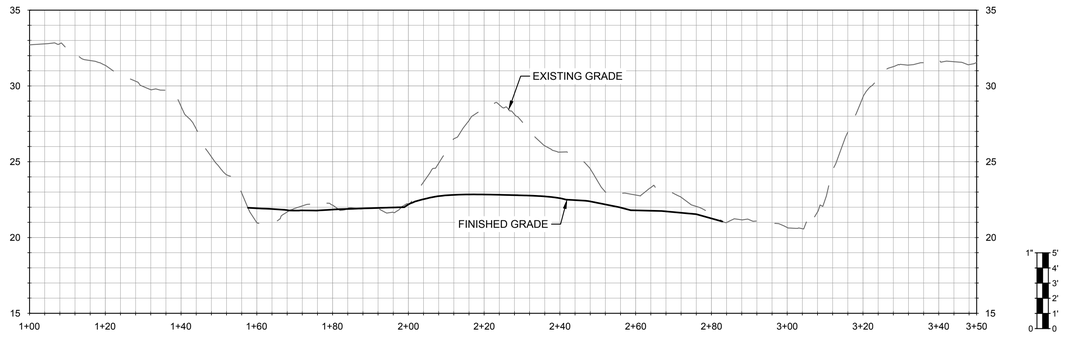
CROSS SECTION AND PHOTOS

OCEANO, CALIFORNIA

SHEET 8 OF 8

ROAD NO.	JOB NO.	SHEET NO.	TOTAL SHEETS





A SECTION

HORIZONTAL SCALE: 1" = 20', VERTICAL SCALE: 1" = 5'

GRAPHIC SCALE

0 10' 20' 40'

(IN FEET)
1 IN = 20 FT

SEDIMENT AND VEGETATION REMOVAL GENERAL NOTES:

1. THE OFFSETS TO THE LOW FLOW CHANNEL (15' TYP, INDIVIDUAL SITES MAY VARY) AND THE EXISTING WETLAND AREAS WILL BE STAKED IN THE FIELD BY A QUALIFIED BIOLOGIST, IMMEDIATELY PRIOR TO WORK. WETLAND AREAS NOT CONFLICTING WITH WORK AREAS SHALL BE PROTECTED WITH BOUNDARY FENCING (TYPE ESA) AND AVOIDED.
2. THE CONTRACTOR SHALL STAKE OUT THE LOCATIONS OF ALL LOG STRUCTURES IMMEDIATELY PRIOR TO WORK. THE ENGINEER SHALL NOT BE RESPONSIBLE FOR RE-STAKING LOST, DAMAGED, OR STOLEN STAKES.
3. THE EXISTING CONDITIONS LOW FLOW CHANNEL ALIGNMENT DEPICTED ON THE DRAWINGS IS BASED ON CONDITIONS AT THE TIME OF THE SURVEY. SOME CHANGES SHOULD BE ANTICIPATED AT THE TIME OF CONSTRUCTION, AND SHALL BE ACCOMMODATED THROUGH MINOR ADJUSTMENTS TO THE WORK LIMITS, AS DETERMINED BY THE ENGINEER.
4. TEMPORARY ACCESS PATH TYPE AND LOCATION SHOWN FOR REFERENCE ONLY. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING CONSTRUCTION ACCESS TO SEDIMENT AND VEGETATION MANAGEMENT AREAS AND IS RESPONSIBLE FOR RESTORATION OF LEVEE TO ORIGINAL CONDITIONS UPON COMPLETION OF CONSTRUCTION.
5. PROVIDE DEWATERING, FISH BLOCK NET AND TURBIDITY CURTAIN WHEN WATER IS PRESENT IN LOW FLOW CHANNEL PER SPECIFICATIONS.

EARTHWORK VOLUME

CUT: 357 CU. YDS.
FILL: 58 CU. YDS.
NET: 299 CU. YDS.
VOLUME ADJUSTED BY ASSUMED COMPACTION FACTOR OF 15%

LEGEND:

- EXISTING GRADE CONTOURS
- PROPOSED CONTOURS
- LIMITS OF GRADING
- RIGHT-OF-WAY
- EXISTING DIRT ROAD

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REGISTERED PROFESSIONAL ENGINEER
VALERIE G. HUFF
No. 72426
FOR PLAN REVIEW ONLY
NOT FOR CONSTRUCTION
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STATE OF CALIFORNIA

SIGNATURE

DATE SIGNED

0 1 2 3
ORIGINAL SCALE IN INCHES FOR REDUCED PLANS

SEDIMENT AND VEGETATION MANAGAMENT					
GRADING PLAN					
SAN LUIS OBISPO COUNTY, CA					
Designer	Date	Drawn By	Date	CHECKED BY	Date
VGH	7/15/2025	JSW	7/15/2025		

Diversion Dewatering Plan

Arroyo Grande Creek Waterway Management Program

Revised July 2025

Prepared by:
San Luis Obispo County Flood Control and Water Conservation District
County Government Center, Rm 206
San Luis Obispo, CA 93408

(July 2025 revisions are indicated in blue text)

Table of Contents

1.0 Introduction

The San Luis Obispo County Flood Control and Water Conservation District (District) has prepared this Diversion and Dewatering Plan (Plan) for the Arroyo Grande Creek Waterway Management Program (Project) located in Oceano, CA. The Project is a comprehensive set of actions designed to restore the capacity of the leveed lower three miles of Arroyo Grande Creek channel and the Los Berros Creek diversion channel to provide flood protection up to a 10-year storm event. Actions include sediment management, vegetation management, maintenance of installed log structures, or other activities as described in Annual Work Plans. The Project may require diverting and dewatering of surface waters within the Arroyo Grande Creek and Los Berros Channel during construction activities.

The creek consists of a low flow channel and secondary channel. The dewatering and diversion of water will be to maintain a dry construction area in sediment removal areas, and to implement log structure maintenance or other activities as described in Annual Work Plans.

Prior to and during construction activities, the Plan will be implemented according to the Central Coast Regional Water Quality Control Board (RWQCB) 2015 Diversion and Dewatering Plan guidelines. Refer to Figure 1.0-1 for the project site Vicinity Map.

1.1 Objectives

The objectives of this Plan are to:

- Provide procedures and methodology for diversion/dewatering activities
- To protect water quality and aquatic resources
- Establish a monitoring and reporting program for discharge water
- Comply with local, State, and Federal regulations

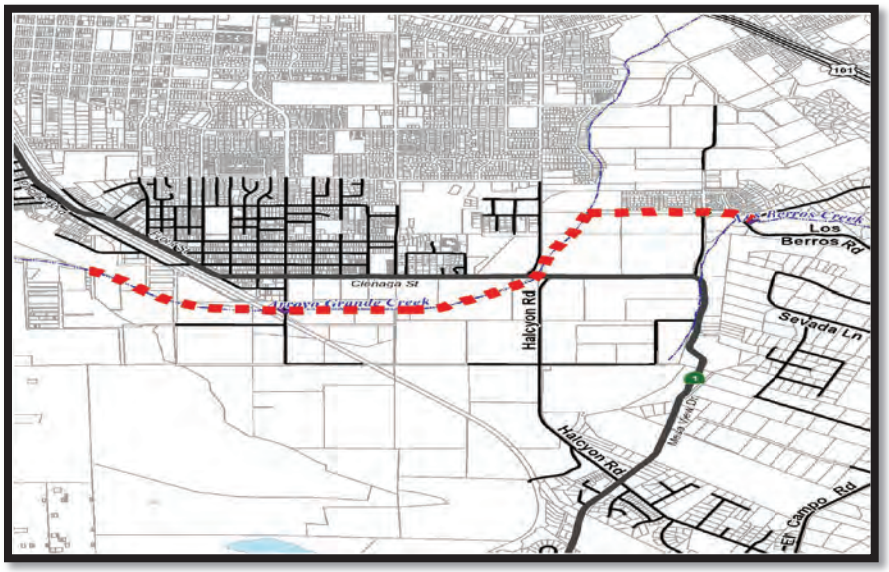


Figure 1.0-1 Vicinity Map

2.0 Diversion and Dewatering Activities

2.1 Dewatering System

The Project construction area as descibed in the Annual Work Plan will be isolated by use of diversion dams on the upstream and downstream side of the work area. The dams will be capable of retaining water and isolating the construction site with stacked washed gravel bags and impermeable plastic sheeting or water filled bladder dams that will redirect the normal and peak flows to the low flow channel outside of the limits of the work area, or through a pipe for enclosed gravity conveyance.

2.2 Work Zone Dewatering

After the diversion dams are installed, a pump will be utilized to remove water from the work area. A sump pump may also be needed to catch flows if they seep under the diversion dam. Sump pump(s) will be located inside of the diversion dam so that seepage water can be pumped out as it is encountered. To collect water within containment sump pumps will be placed at a low point or within small pits where it can be accumulated and pumped out. All water will be pumped into a settling basin or geo-textile bag filter to capture sediment. The settling basin may be sterile (free of non-native and/or invasive weedy species) straw bales, such as rice straw bales wrapped in filter fabric, or a low lying sump area within a dry vegetated portion of the secondary channel. Generators used for pump operation will be located outside of the stream bed and bank and will be placed within secondary containment. No fueling will occur outside the designated equipment storage areas (i.e., at least 60 feet away from riparian / wetland habitats).

Pumped water shall be either settled or filtered prior to discharge into a dry vegetated portion of the secondary channel which will allow water to settle and infiltrate outside of the active channel of Arroyo Grande Creek. The size and capacity of the redundant hoses and pumps staged onsite will be determined by field conditions prior to Plan implementation. Should the diversion process result in erosion at the discharge points, immediate action will be taken to prevent adverse impacts to the water body and notify the RWQCB staff as soon as practicable, but no later than 24 hours.

Pump intakes pumping surface waters shall be screened with wire mesh no larger than 0.2-inch and each pump will be placed in a screen basket or bucket to reduce the velocity of water flowing into the pump, and to reduce potential harm to aquatic life via entrainment. The dewatering system shall be installed with minimal disturbance of the creek bottom and avoid excessive turbidity in the creek. A qualified biologist will monitor the pump intake screen during pumping activities for debris. All construction materials used shall be made of inert materials that will not release toxic materials into the water.

2.3 Peak Flow Spill Contingencies

Weather forecasts from the National Oceanic and Atmospheric Administration (NOAA) will be reviewed daily by a qualified person within an appropriate timeline before work activities to anticipate/evaluate significant rain events or tidal events that could cause dewatering/diversion complications. Furthermore, the diversion dams will be

visually monitored daily by the onsite qualified person for system insufficiencies (i.e., flow exceedances) that could result in a containment breech. In the event there are higher than anticipated flows that breach the diversion dam, additional gravel bags, visqueen, hoses, and pumps will be staged onsite and implemented immediately to prevent a collapse of the diversion dam. Should the diversion dam fail, immediate action will be taken to prevent adverse impacts to the water body and notify the RWQCB staff as soon as practicable, but no later than 24 hours. In the event of a spill (i.e., motor oil or gasoline from equipment) onsite trained personnel will respond immediately with the onsite staged spill kit in accordance with applicable spill contingency plans/procedures and notification requirements.

2.4 Gravel Bags

Any gravel bags utilized during diversion/dewatering activities must adhere to Caltrans' standard specifications in accordance with §13-5.02G, and must be washed and free of fine sediment to protect water quality, should be woven filter fabric, minimum unit weight of four ounces/yard^2, with a Mullen burst strength exceeding 300 pound/inch^2 in conformance with the requirements in American Society for Society and Testing (ASTM) ASTM designation D3786, and ultraviolet stability exceeding 70% in conformance with the requirements in ASTM designation D4355. Use of burlap may not acceptable in some jurisdictions. In addition, gravel bags will be wrapped with heavy plastic sheeting (i.e., visqueen). Gravel bags will be reshaped and replaced as needed.

2.5 Aquatic Life Removal and Protection

Prior to initial dewatering of the Project site, fish and other aquatic resources shall be captured and relocated outside of the work area by a qualified biologist and pursuant to the permits issued for the project. Block nets will be installed upstream and downstream of the planned diversion during the fish relocation stage and will remain in place until after the diversion is complete. Following isolation of the diverted reach (work area), approved biologist(s) would systematically capture and relocate aquatic life using permit approved methods (e.g., seine, dip nets, etc.). Approved biologist(s) would monitor the diverted reach for stranded aquatic life for the duration of the dewatering process. Next, the diversion will be constructed to isolate the work area and to facilitate dewatering the work area, during this period use of heavy equipment will be avoided. To further avoid water quality issues, the construction activities will occur during the period of June 1 and October 31 when Arroyo Grande Creek and Los Berros Channel are at their lowest flows. During dewatering activities, the 0.2 inch pump intake screen will be monitored by a qualified biologist and checked regularly. If debris is present, the biologist or the contractor will remove the debris and ensure the pump remains functional. Prior to construction activities a qualified biologist will provide a training session for all work personnel prior to start of construction to provide information on 401 Water Quality Certification avoidance and minimization measures to protect water quality.

2.6

Maintenance and Inspection

Any substance used to assemble or maintain diversion structures will be non-toxic and non-hazardous. Exclusionary devices, diversion structures, and embankments will be inspected by the onsite qualified personnel before and after any significant storms, and at least once per day while in service to inspect for damage to the linings, accumulation of debris, sediment buildup, and adequacy of the slope protection. Removal of debris and

repairs to lining and slope protection will be performed as necessary. Pumps will be monitored frequently to ensure proper operation.

3.0 Monitoring and Reporting Program

The following presents the monitoring and analytical requirements during dewatering activities at the Project site. The components of the monitoring and reporting requirements include baseline monitoring, daily monitoring, and weekly/post completion reporting requirements.

3.1 Monitoring

Prior to implementation of the Plan the District will conduct baseline sampling to determine natural turbidity at the project site.

The District will conduct daily monitoring and record keeping documentation of visible water characteristics (e.g., visible turbidity, sedimentation, and/or erosion) during installation and removal of the diversion systems and during active dewatering.

The District will conduct daily water quality sampling and record keeping documentation of the Project site for turbidity during active dewatering. Where the natural turbidity is between 0 and 50 Nephelometric Turbidity Units (NTU), increases may not exceed 20 percent. Where the natural turbidity is between 50 and 100 NTU, increases may not exceed 10 NTU. Where the natural turbidity is greater than 100 NTU, increases may not exceed 10 percent. If sampling results indicate noncompliance with this Plan, then follow-up sampling upstream of the Project site will also be performed.

In the event the District discovers adverse conditions that could potentially negatively impact water quality or if the turbidity exceed the criteria described above, the District will take immediate corrective actions to prevent adverse impacts and notify the Regional Board as soon as practicable, but within 48 hours. The District will record the results of each daily visual monitoring, sampling, and any corrective actions taken.

3.2 Reporting

Throughout the period of active dewatering/diversion, the Contractor will submit to the Regional Board weekly monitoring and maintenance reports. The Contractor will submit the first report on the first Wednesday after the dewatering/diversion activities commence. The Contractor will submit the last report the Wednesday after the dewatering/diversion activities are complete.

The weekly reports will include:

1. Time, date and location of dewatering/diversion and location of discharge(s);
2. Summary of daily visual monitoring and water sampling;
3. Estimated volume of dewatering/diversion discharges;

4. Photographs (upstream and downstream from the same vantage points at each location); and
5. Maps

4.0 Dewatering and Device Removal

Once construction activities are complete, gravel and RSP fabric, or other materials used to facilitate equipment access and mobility will be removed. Upon completion of construction activities, project areas will be recontoured to pre-project conditions, and the diversion will be removed in a manner that would allow flow to resume with the least disturbance and the channel bottom will be returned to natural grades and/or as designed as part of the project. Removal of the diversion will be completed so that excessive turbidity in the creek is minimized. All gravel bags will be removed in their entirety from the Project site. All construction-related equipment, material and temporary best-management activities (BMPs) no longer needed will be removed and cleaned from the Project site in a manner that will not cause adverse impacts to water quality.

5.0 Typical Details

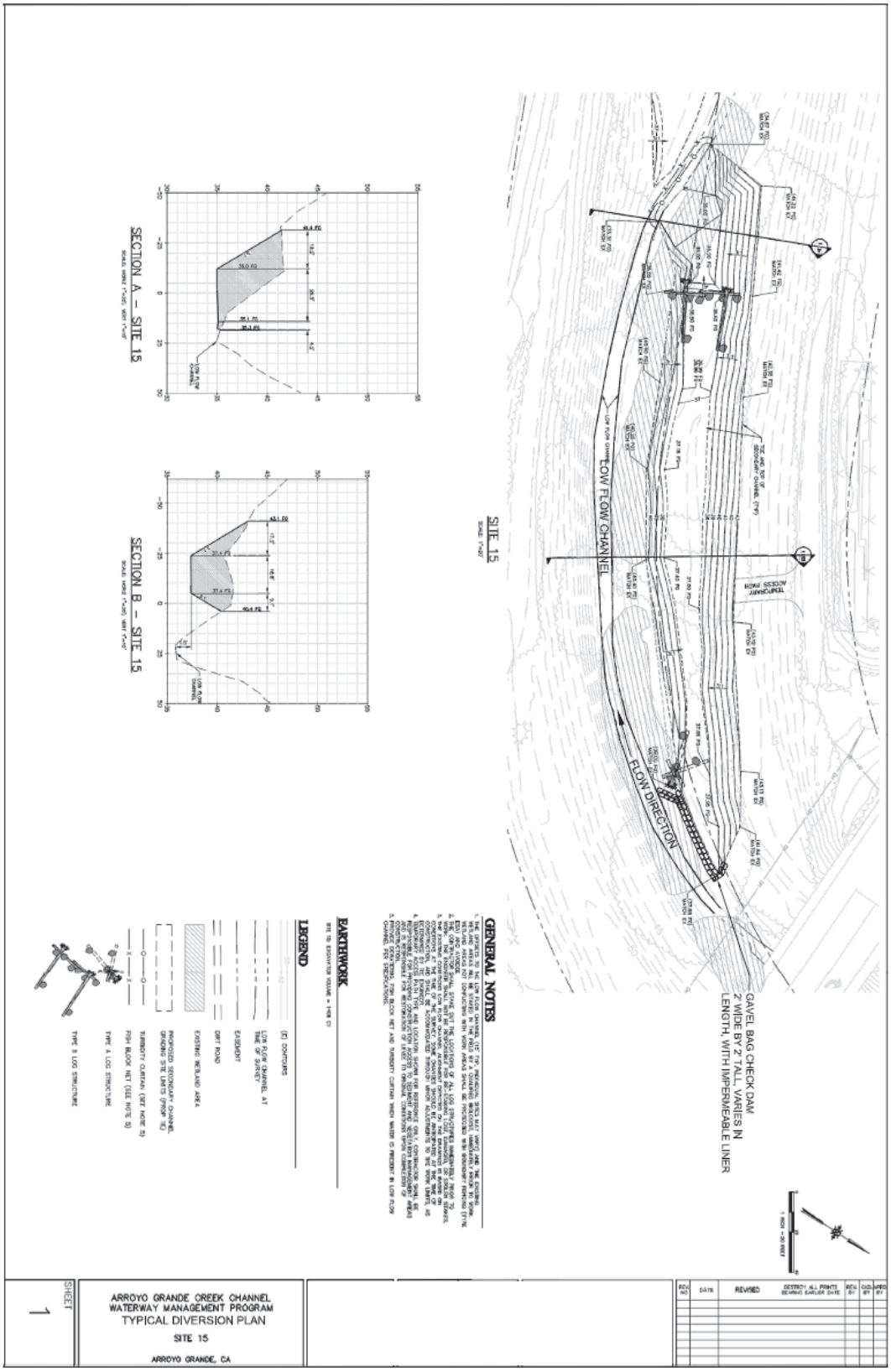


Figure 5.0-1 Typical Site Plan

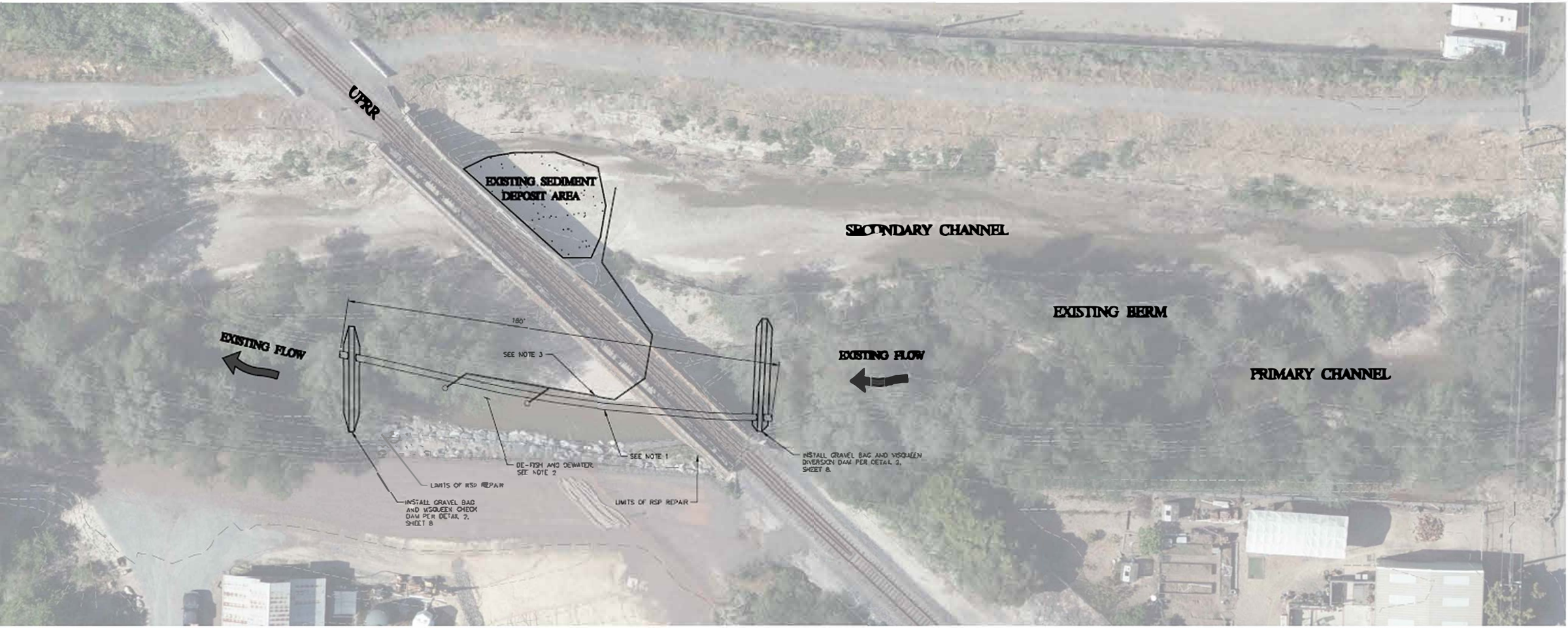
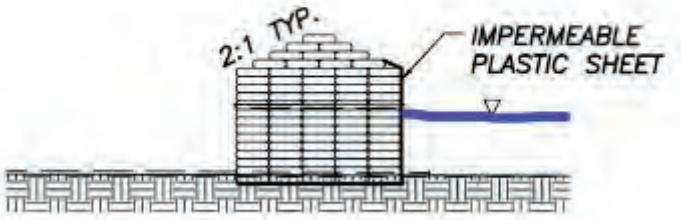
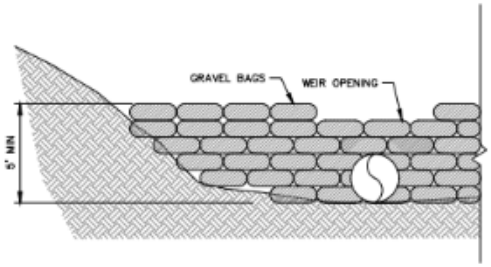


Figure 5.0-2 Typical Dewatering Plan

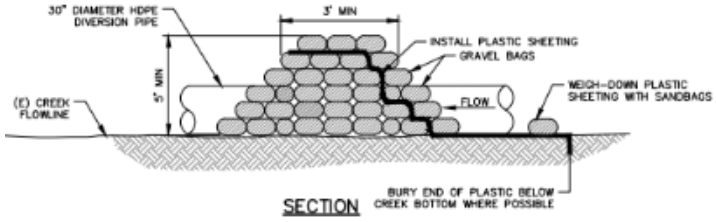


GRAVEL BAG NOTES

1. TEMPORARY DEWATERING FACILITIES SHALL BE IN PLACE PRIOR TO INITIATION OF SLOPE REPAIR WORK.
2. PRIOR TO REMOVING DEWATERING FACILITIES OR RELEASING WATER TO THE PROJECT AREA, ALL BANK PROTECTION, SHALL BE COMPLETE.
3. UPON COMPLETION OF THE PROJECT, ALL MATERIAL USED IN THE TEMPORARY DIVERSION SHALL BE REMOVED FROM THE SITE.
4. NUMBER OF BAGS AND ARRANGEMENT MAY VARY WITH ON-SITE CONDITIONS.



ELEVATION



SECTION

TEMPORARY GRAVEL BAG INLET OR OUTLET CHECK DAM (2)

SHEET 7 N.T.S.

Figure 5.0-3 Conceptual Dewatering Details

Fish Removal and Rescue Plan for Steelhead Trout and Tidewater Goby

2020 Arroyo Grande Creek Channel Waterway Management Program

USACOE Individual Permit SPL-2012-00317-AJS
CDFW 1600 Agreement #1600-2018-0278-R4 & RMA 1600-2018-0115-R4 NMFS BO File No. SPL-2012-00317-JWM
USFWS BO 8-8-15-F-4

Introduction

The County of San Luis Obispo Department of Public Works (County) is conducting the Arroyo Grande Creek Channel Waterway Management Program (WMP). This is a comprehensive set of actions designed to restore the capacity of the leveed lower three miles of Arroyo Grande Creek Channel and the Los Berros Creek diversion channel to provide flood protection up to a 10-year storm event. Actions include sediment management, vegetation management, and levee raise/repair activities.

Relocations

A salmonid biologist shall monitor the work area during placement and removal of temporary stream diversions. The salmonid biologist shall safely relocate juvenile steelhead to a suitable instream location immediately downstream of the work area.

An approved biologist shall monitor vegetation and sediment removal in suitable tidewater goby habitat. All in-water work will be continuously monitored, including the placement, use and removal of temporary stream diversions and the capture and relocation of tidewater gobies. Captured tidewater gobies shall be relocated immediately downstream of the work area.

Monitoring & Best Management Practices

During diversion installation and removal activities, surveys and monitoring for steelhead trout and tidewater goby will occur. The following measures will be implemented to minimize and avoid impacts:

1) Only Service-approved biologists may capture, handle, and monitor steelhead trout or tidewater goby.
2) The Service-approved biologist(s) must conduct a training session for all project personnel prior to any project activities. At a minimum, the training will include a description of the steelhead trout and tidewater goby and its habitat; the general provisions of the Act; the necessity for adhering to the provisions of the Act; the penalties associated with violating the provisions of the Act; the specific measures that are being implemented to conserve the steelhead trout and tidewater goby while this project is being conducted; and the boundaries within which the project may be accomplished. The program must also cover the restrictions and guidelines that will be followed by all construction personnel to reduce or avoid effects on these species during project implementation. The project foreman will be responsible for ensuring that crew

members adhere to the guidelines and restrictions. Due to the duration of the project, multiple education programs must be conducted as needed to inform new personnel.

3) The Service-approved biologist must record all pertinent information when relocating steelhead trout or tidewater gobies including the species and number of individuals captured, method of capture, site of capture, and site of relocation.
4) During all work, the Service-approved biologist must be onsite and continuously monitoring project activities, e.g., the placement and removal of any required water diversions, the status of the water diversion. The Service-approved biologist must capture any stranded steelhead trout and tidewater gobies or other native fish species and relocate them to suitable nearby habitat.
5) In-creek diversion berms, dams, bladders, and/or pipelines or conduits, or another agency-approved method will be installed prior to construction activities to isolate the work area. Pumping to dewater the work area will likely be necessary during Project activities to provide a dry work area.
6) Non-erosive materials (e.g., clean gravel-filled bags, sheet pile, metal/rubber/plastic bladders) will be used to construct the diversion structure.
7) To minimize impacts to species that may be dependent on the water resources within the area, sensitive species, and conflicts with fish, in-creek construction activities will be planned for periods between June 1 and October 31, when the creek is at low water capacity, to the greatest extent feasible.

As discussed above, monitoring for steelhead trout and tidewater goby will include recording all pertinent information during relocation efforts. The Service-approved biologist may use the below template for recording purposes.

Date	Time	Species	# of Individuals Relocated	Method of Capture	Location of Capture	Location of Relocation