Meadow Creek Lagoon Habitat Restoration Project, Oceano, San Luis Obispo County, California

Preliminary Alternatives Analysis Report

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1 INTRODUCTION

This report is an update on the County's compliance with the requirements of Reasonable and Prudent Alternative 3 (RPA 3) included in the National Marine Fisheries Service (NMFS) Biological Opinion (BO) (NMFS 2017a) for Department of the Army permit SPL-2012-00317 issued by the U.S. Army Corps of Engineers (Corps) to the County of San Luis Obispo Flood Control and Water Conservation District (District) for the Arroyo Grande Creek Waterway Management Program (WMP) (USACE 2018).

RPA 3 was developed after extensive coordination between NMFS and the District. RPA 3 requires the District to implement a habitat restoration project in an 8.28 acre area of Meadow Creek Lagoon. RPA 3 defines the restoration project as follows:

"The principal objectives of the District's proposal, subject to modification during the science panel, California Environmental Quality Act, and government approval process described below, involve setting back or removing 1000-ft of levee in the vicinity of these lagoons (within the action area) or relocating or removing tidal gates, or a combination of these, and converting 8.28 acres of land owned by the District and California Department of Parks and Recreation ("State Parks") to wildlife habitat. . . In support of the restoration goal, the District agrees to implement a preliminary design approach that includes an alternative analysis and environmental review of a preferred alternative."

It was determined early on that levee removal could not be accomplished without levee setback to protect upstream areas from increased flooding from the Arroyo Grande Creek and Lagoon, so this alternative is referred to throughout this report as the "levee setback" alternative. Preliminary modeling results and coordination with an affected landowner, the South County of San Luis Obispo Sanitation District (Sanitation District), have informed the District that the levee setback alternative envisioned in RPA 3 is not feasible. A conceptual plan of the levee setback alternative is shown in Figure 1.

This report presents the District'sconclusion that the envisioned levee setback is not feasible, recommends continuing with the RPA 3-stipulated preliminary design approach and environmental review of feasible alternatives, and clarifies the scope of the alternatives analysis to guide NMFS and Science Panel input towards implementation of the preferred alternative for the RPA 3 Meadow Creek Lagoon Habitat Restoration Project. The District requests Corps and NMFS concurrence that this approach meets RPA 3 prior to advancing on project development and spending finite project funds.

The District's determination was made in consideration of Science Panel recommendations, anticipated government approval processes, and the ESA regulations implementing Section 7 (50 C.F.R. § 402.02) that define reasonable and prudent alternatives as actions: "[1] that can be implemented in a manner consistent with the intended purpose of the action, [2] that can be implemented consistent with the scope of the Federal agency's legal authority and jurisdiction, [3] that is economically and technologically feasible, and [4] that the Director

believes would avoid the likelihood of jeopardizing the continued existence of listed species or resulting in the destruction or adverse modification of critical habitat."

In accordance with the requirements of RPA 3, the District has completed the following planning tasks:

- Convened a Science Panel (fall 2020),
- Awarded a contract for engineering modeling and design services (spring 2021);
- Completed a technical memorandum describing available studies, data, and data gaps (Stillwater 2021);
- Completed an existing conditions report (Stillwater 2022a);
- Developed a preliminary matrix of alternatives; and
- Conducted preliminary modeling of the RPA 3-defined levee setback alternative (Stillwater 2022b) to determine if it would result in increased flooding in upstream areas.

The following summarizes in detail why the levee setback is infeasible and describes the District's next steps. Specifically, the report includes a:

- detailed description of why the levee setback is infeasible;
- discussion of the RPA 3 restoration goals;
- preliminary assessment of three alternatives and their potential to meet RPA 3;
- description of the origin of the 8.28-acre restoration area; and
- discussion of the restoration project scope as described in the BO.

2 LEVEE SETBACK ALTERNATIVE ANALYSIS

The envisioned levee setback alternative consists of removing approximately 1,000 feet of levee along the south boundary of Meadow Creek Lagoon, relocating the levee along the north and west sides of the lagoon, relocating the Sand Canyon flap gate in the relocated levee at the upstream Meadow Creek channel, and constructing habitat improvements in Meadow Creek Lagoon (Figure 1). A second gate would accommodate inflow to the lagoon through the relocated levee from the Oceano Airport property to the east.

Figure 1. Levee setback alternative showing relocated levee (red) and Sanitation District outfall pipe (yellow) along the south side of Meadow Creek Lagoon.

2.1 Flood Impact Analysis

Basis for Analysis: RPA 3 acknowledges that " the Project will also need to address flood impacts from removing and relocating the existing levees and tide gates (District 2017d [July 24, 2017, District correspondence to USACE, referenced herein as 2017]). Specifically, the Project will need to incorporate design plans for various flood-protection alternatives (e.g., levee set back, tidal gate, flood walls, etc.)."

Prior to award of the engineering contract with Stillwater, the District coordinated development of Science Panel guidance on the targeted restoration design objectives, memorialized in the Science Panel Input Summary for RFP (District 2020). The District obtained Science Panel concurrence on the following: "E nsure that the project does not reduce flood storage capacity or worsen flooding conditions in adjacent developed areas." State Parks objected to any indication in the document that the project could improve existing flood conditions.

Preliminary Modeling Results: Preliminary hydrologic modeling of the levee setback alternative indicates that it has the potential to increase flooding in upstream areas. The preliminary modeling was limited to scenarios most relevant for consideration of the current level of flood protection provided by the levees. The completed WMP increased flood capacity of the channel to contain the 10-year flood event, compared to the pre-project protection of 2- to 5-year events.

Therefore, the selected scenarios were the 2-, 5-, and 10-year flood events, with a closed Arroyo Grande Lagoon outlet for a worst-case flooding scenario (Stillwater 2022b). Results show increases in flood levels of between 0.88 inch (2-year event) and 2.17 inches (10-year event). Based on the trend of increasing effects with increasing storm intensity, the District expects that project-related effects would increase with more severe storms such as 25-, 50-, and 100-year events.

Modeling the remaining storm scenarios would likely provide a more significant measure of flood impacts to support the conclusion that the levee setback is infeasible. However, the District determined that modeling additional scenarios of the levee setback alternative is not warranted because:

- Preliminary modeling shows an increase in flood risk from the levee setback alternative,
- Preliminary modeling shows a trend of increased flood effects with increasing storm severity, and
- Performing additional modeling would be irrelevant because the existing Sanitation District outfall pipe is an unavoidable physical constraint and is the ultimate reason for concluding that the levee setback alternative is infeasible.

ESA Regulations Implementing Section 7 Requirements: Science Panel members (NMFS and State Parks) suggest that a 2.17-inch increase in flood levels is not significant and should be balanced against the habitat benefits of the project. However, any increase in flood levels

reduces the flood protection provided by the levees and the original action of the Arroyo Grande Creek Waterway Management Program, which is intended to increase flood protection to the surrounding community. Pursuing this alternative does not fit the "intended purpose" test (50 C.F.R. § 402.02).

District's Role in Community Flood Protection: The District has been involved with evaluating and trying to reduce flood risk in the community of Oceano from 2004 to the present. This includes:

2004 Oceano Drainage and Flood Control Study
Completed: 2004
Budget: $150,000

2006 Arroyo Grande Creek Erosion, Sedimentation and Flooding Alternatives Study
Completed: 2006
Budget: $150,000

Highway 1 and 13th Street, Oceano – Drainage Improvements
Completed: 2020
Budget: $6,800,000

Arroyo Grande Creek Waterway Management Program, Phase I and Phase II
Completed: Phase I – 2020 Phase 2 – 2021
Budget: Phase I - $5,160,000 Phase 2 - $2,435,000

Bridget Replacement at Air Park Drive, Oceano Lagoon
Completed: 2019
Budget: $3,805,000

Any increase in flooding caused by the restoration project will be met with community objections. The District has conveyed a goal of no increase in stormwater runoff to Meadow Creek Lagoon by enforcing conditions on other regional projects, for example, in comments to the Oceano Airport regarding proposals that would increase impervious area at the airport. The District is obligated to hold to the same standard applied to other regional projects.

Floodplain and National Flood Insurance Program: Any increase in flooding upstream of the project area has the potential to change the 100-year floodplain conditions in the residential properties in the Strand Way and Aloha Place neighborhoods, and on adjacent developed lands including the Oceano Airport and the Sanitation District (Figure 2). Changes to the base flood elevations or special flood hazard areas defined by the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps can have implications for flood insurance for private property owners. The District considers the potential to introduce or increase 100-year flood conditions and flood insurance burdens on landowners as an unacceptable outcome of the restoration project.

CEQA: An increase in community flooding that results from the project is likely to be considered a significant adverse impact under CEQA. [CEQA Guidelines Section 15382: "Significant effect on the environment" means a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project. . . A social or economic change related to a physical change may be considered in determining whether the physical change is significant.]

The San Luis Obispo County Board of Supervisors is not likely to certify a CEQA document for a habitat restoration project that has a significant adverse effect on community flooding impacts, and is at odds with the overarching community flood protection goals of the Flood Control District and the WMP.

Permits: Assuming the restoration project requires an individual permit from the Corps, the project will undergo public interest review and a determination of compliance with the Section 404(b)(1) guidelines. The 404(b)(1) guidelines require approval of the least environmentally damaging practicable alternative, so long as the alternative does not have other significant adverse environmental consequences. Increased community flooding associated with the levee setback alternative would not be in the public interest and would be an appropriate basis for rejecting an otherwise environmentally acceptable alternative.

Sea-Level Rise: The entire Meadow Creek system between the coastal dunes and Highway 1 is a low-elevation, back-barrier system that will be increasingly prone to flooding with future sea-level rise. The potential for increased flooding of private property under both current conditions and with future sea-level rise are likely to increase the scrutiny and concern from federal and state permit agencies responsible for issuing environmental permits for the restoration project.

Funding: The Arroyo Grande Creek Levees are within Flood Control Zone 1/1A and property owners within this zone of benefit contribute funds equitably for WMP maintenance activities. Project-related increases in flooding that affect some property owners would be met with objections based on not only the exacerbated flooding conditions, but also the fairness of the fees.

The preferred alternative for the Meadow Creek Lagoon Habitat Restoration Project will require overall community support to use Zone 1/1A funds or approve future increases to property assessments that may be required to fund its implementation. It is prudent to consider in this preliminary alternative analysis that the levee setback alternative is likely to be objectionable to property owners because this alternative provides no improvement in flood conditions and will unfairly worsen flood conditions for some properties.

To offset financial impacts to the community and ensure implementation and completion of RPA 3, the District continues to be committed to seek available grant funds. The District must consider each project alternative's eligibility for future a vailable grant funds because this further ensures that the final proposed project is economically feasible for the District to implement. Grant awards are available to shovel ready projects (introducing challenges with timing) and typically exclude projects that are permit mitigation requirements. Awards also

tend to favor projects with multiple benefits and would be unlikely to include a project that doesn't improve or that exacerbates an existing flood hazard. For these reasons, the levee setback alternative is not likely eligible or competitive for future grant opportunities.

The District is obligated to carefully consider and eliminate an alternative that cannot be feasibly funded or fairly implemented for the entire population served.

Summary of Flood Impacts: The levee setback alternative cannot be implemented in a manner consistent with the purpose of the WMP, which is to provide flood relief to the community. The levee setback alternative is also considered economically and technically infeasible (50 C.F.R. § 402.02) given:

1. the flooding problems in Meadow Creek Lagoon
2. the District's past and ongoing efforts to alleviate that flooding
3. the likely worsening of flood conditions with sea level rise
4. the anticipated flood insurance implications, community objections, and challenges in obtaining funding for a levee setback project from affected communities/landowners, and
5. anticipated challenges related to CEQA certification and subsequent permitting.

As described above for the Science Panel Input Summary for RFP (District 2020), State Parks objects to a project alternative that improves existing flood conditions. While reduction of flooding in Meadow Creek Lagoon is not an objective of the restoration project, a restoration project that meets the RPA 3 goal *should not be excluded from consideration if it also reduces flooding in the MCL system*. The District expects that obtaining community acceptance and funding for a project that does not improve flood conditions in Meadow Creek Lagoon may be substantially more challenging and could have direct bearing on successful implementation of the project, making it economically infeasible (50 C.F.R. § 402.02).

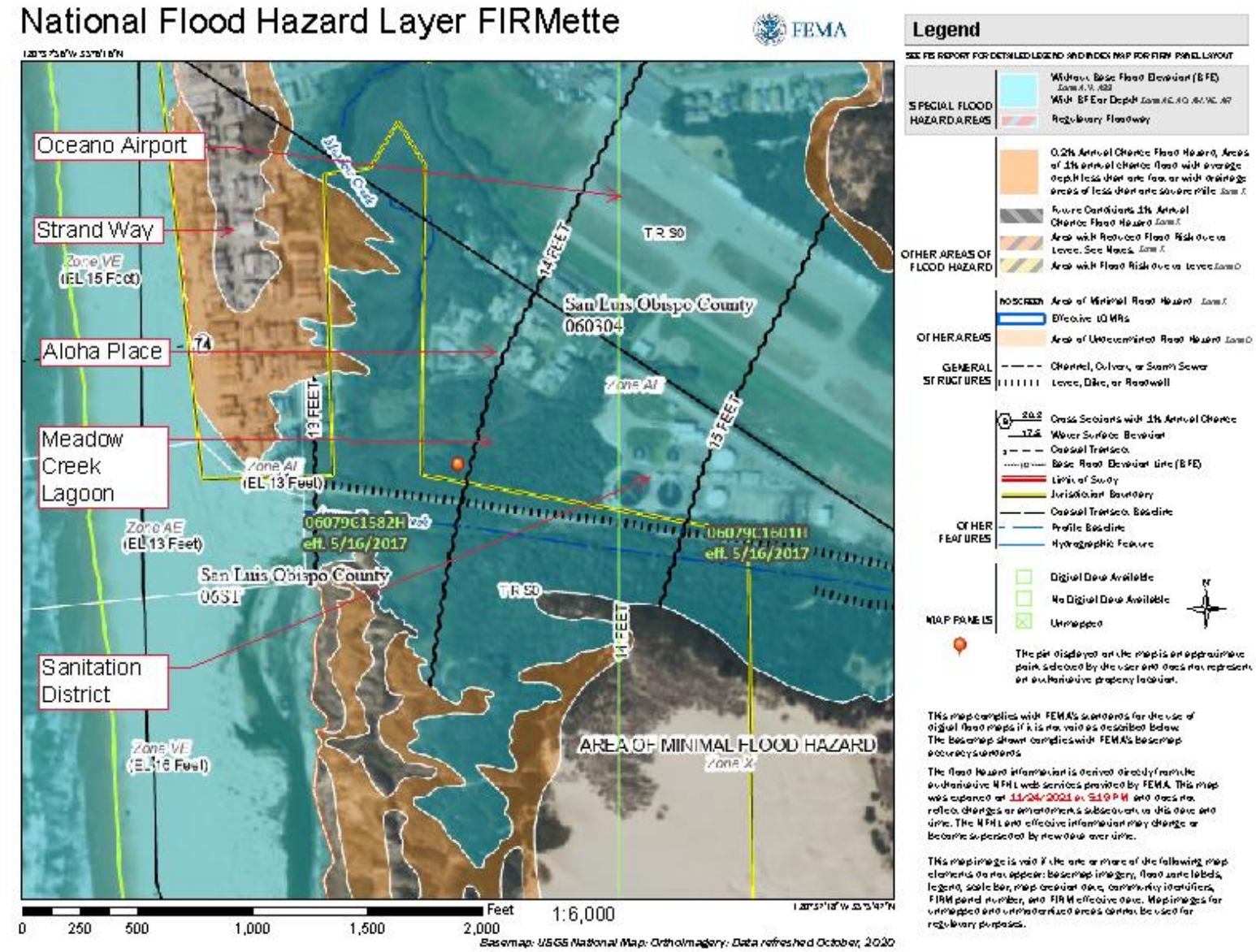

Figure 2. Federal Emergency Management Area (FEMA) floodplain and flood hazard map for the project area and vicinity.

2.2 Physical Constraints Analysis - Sanitation District Outfall

The Sanitation District outfall pipe crosses the southern edge of Meadow Creek Lagoon just north of the levee (Figure 1). It extends from the treatment plant (east), to the dunes and beach at the south end of Strand Way (west), to several thousand feet offshore where an ocean diffuser discharges on the seabed in an approximate water depth of 55 feet. It is a 36-inch pipe located approximately 8 feet away from the base of the levee (Stillwater 2022a).

The presence of the Sanitation District outfall pipe was not considered in designating the 8.28 acre Meadow Creek Lagoon restoration area for RPA 3. A 1997 survey for outfall pipe repairs shows the pipe at a depth of 1 to 2 feet below existing ground surface along the levee, and its presence and approximate depth were noted in the Existing Conditions Report (Stillwater 2022a). Field investigations by County Public Works surveyors confirmed that the outfall pipe is much shallower than suggested on the as-built survey. The top of the pipe is less than 5 inches below existing ground surface next to the flap gate through the levee (Figure 3).

The outfall pipe conflicts with the implementation of the levee setback alternative. The District evaluated whether the outfall pipe could be reconfigured to eliminate such conflict and discovered these unavoidable and unresolvable issues:

1) Levee setback if outfall pipe were not in place: If the outfall pipe was not there, substantial excavation would be required to create the open hydrologic exchange envisioned by the RPA 3 levee setback. Topographic data compiled for the Existing Conditions Report show a rise in existing ground elevations in Meadow Creek Lagoon from approximately 5 feet at the flap gate to approximately 12 feet near the Sanitation District facilities (Figure 4, annotated from Stillwater 2022a, Appendix A, Base Map). Rough estimates of the soil removal costs to lower elevations in Meadow Creek Lagoon to match the Arroyo Grande channel elevations range up to approximately $30 M depending on the extent of removal (Table 1). This means that the feasibility of restoring open hydrologic exchange between the two lagoons for the full length of the levee removal area would be limited by cost.

2) Levee setback with outfall pipe in place: If the levee were removed, the presence of the pipe at a shallow depth below ground surface would interfere with creating "open exchange" between the lagoons for the entire levee removal length because it would limit excavation depths. Additionally, removal of the levee would expose the outfall pipe to Arroyo Grande Creek flows, and armoring of the pipe would be required. This would raise the ground surface elevation along the pipe, further restricting "open exchange" between the lagoons.

   The Sanitation District is opposed to any risk to the outfall pipe that would result from removing the levee, which has successfully provided flood protection to their facility since the outfall's 1997 installation, and as existing (i.e., a solid embankment approximately 15 feet wide at the crest and approximately 70 feet wide at the base, with an elevation of 20 feet) is considerably more protective than riprap over the pipe.

Installation, maintenance, storm damage repairs, permitting, and all costs associated with armoring the pipe would be the responsibility of the restoration project in perpetuity.

3) Lowering the Outfall Pipe in Place: Lowering the outfall pipe in place would require either a dip in the pipe through the restoration area, or lowering the entire pipe profile by lowering the ocean-end of the pipe, which would require extending the existing discharge point further out in the ocean.

   A dip in the pipe is not acceptable from a maintenance perspective (i.e., the dip would accumulate sediment and debris) and would require converting the pipe from a gravity-fed system to a pumped system. Converting the Sanitation District outfall to a pumped system would require that the restoration project bear the cost of purchase, operation, maintenance, repairs, and associated permitting of the pump system in perpetuity.

   Reconstructing the entire pipe at a lower elevation would constitute a major construction project with substantial permitting complexities, and depending on the configuration, could also require pumping. Additionally, the installation, maintenance, repairs, permitting, and all costs associated with a pumped system would be the responsibility of the restoration project in perpetuity.

4) Relocate the Outfall Pipe: Suggestions were made to reroute the outfall pipe around the north side of the lagoon along the alignment of the setback levee and/or through adjacent neighborhoods. This would include multiple relatively sharp corners or bends in the pipe (Figure 1), which, based on discussion with the Sanitation District, would likely make pipe repairs (e.g., slip-lining) impossible, would require a pipe access manhole at each bend for maintenance, would require converting the gravity-fed system to a pumped system, would require acquisition of a new easement, and would constitute a major construction project with complex permitting complexities. The feasibility of locating the pipe in the relocated levee would need to be determined; otherwise, it would need to be to the north of the relocated levee, reducing the area available for restoration. The costs of permitting and construction for relocating the outfall, and the costs of converting the Sanitation District outfall to a pumped system would need to be borne by the restoration project in perpetuity.

Based on this analysis, relocating the outfall pipe is economically and technically infeasible (50 C.F.R. § 402.02).

Sanitation District Comments: In addition to these engineering and cost implications, the Sanitation District provided written comments on the restoration project alternatives (Sanitation District, 2022a) stating that "any alternatives that remove the levy [sic] protection of the [Sanitation] District outfall line or that requires the [Sanitation] District to construct, and or operate a more complex and energy intensive force-main (pumped) outfall as not being reasonable or practical for the [Sanitation] District to agree to."

The District assumes that the Corps does not have authority to order the removal, relocation, or reconstruction of the sewer outfall, and that a requirement to proceed with a project that involves outfall reconfiguration is not consistent with the Corps "legal authority a nd jurisdiction" (50 CFR § 402.02).

Summary of Physical Constraints Analysis: In conclusion, the levee setback alternative envisioned in RPA 3 is not economically and technical feasible and would not be consistent with the Corps legal authority and jurisdiction due to these issues ascertained during the District's ongoing preliminary design approach:

- interference of the pipe with the restoration goal;
- the technical challenges associated with relocating the pipe, including the need to convert a gravity-fed outfall to a pumped system;
- the likely need for the District to assume responsibility for the condition, maintenance, and permitting of a reconfigured pipe or pumped system; and
- the Sanitation District's opposition to altering the existing location, function, and levee protection of the pipe.

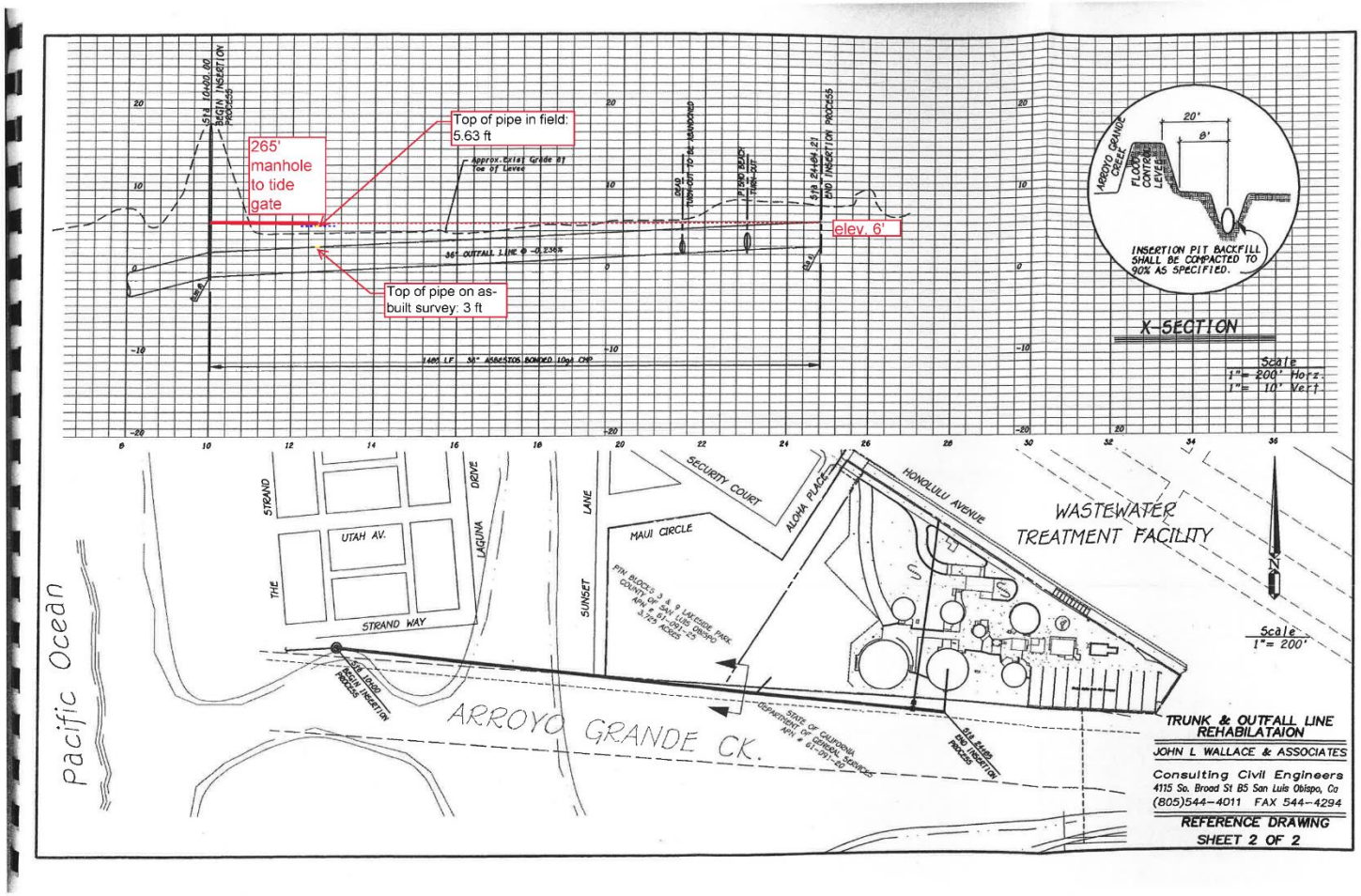

Figure 3. Sanitation District Outfall Pipe 1997 plan for repair (sliplining) of pipe, annotated with District field measurement of depth to pipe near flap gate.

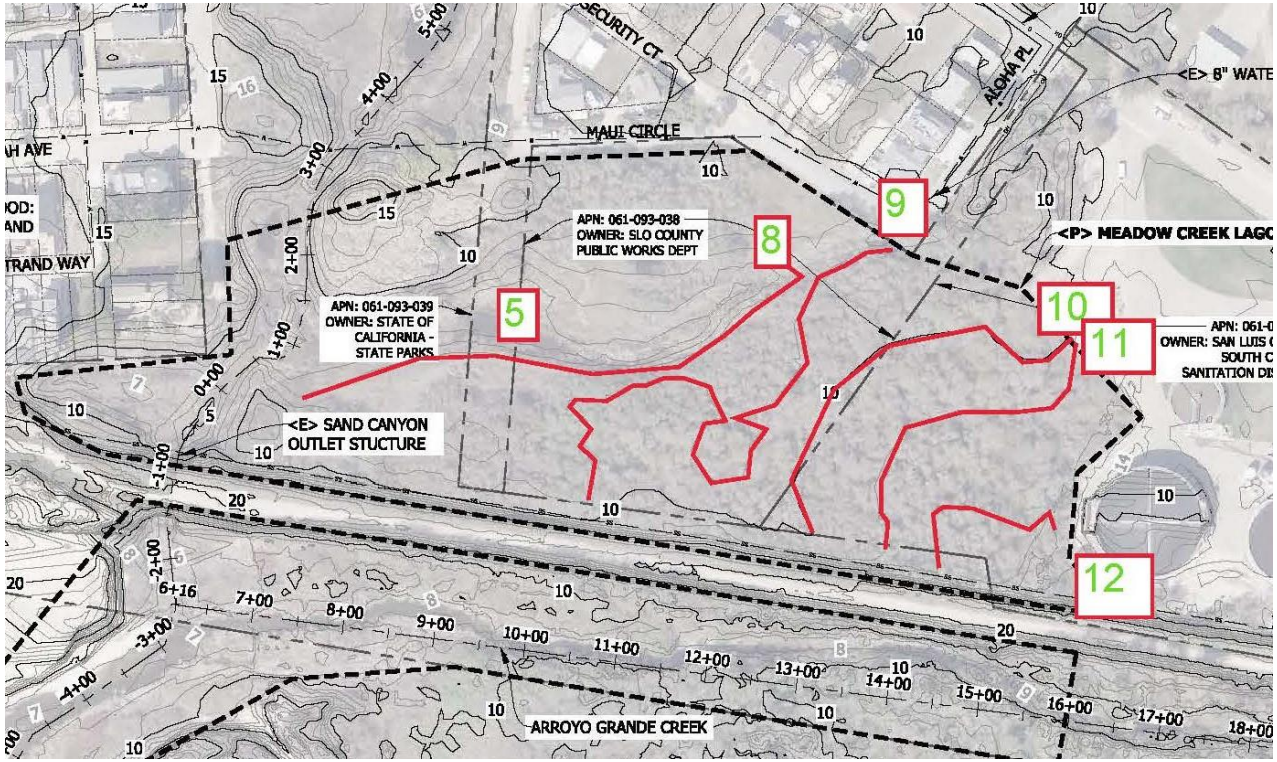

Figure 4. Approximate contours in Meadow Creek Lagoon (plan from Stillwater 2022a).

Table 1. Approximate soil removal area, depth and cost.

Contours	Area (sf)	Incremental Acreage	Target Depth	Average Removal Depth	Volume	Cost	Incremental Volume (cy)	Incremental Cost
8-9	10,000	0.2	7 - 8	1	10,000	$800,000	10,000	$800,000
9-10	32,500	1.0	8	1.5	48,750	$3,900,000	58,750	$4,700,000
10-11	30,000	1.7	8	2.5	75,000	$6,000,000	133,750	$10,700,000
11-12	55,000	2.9	8	3.5	192,500	$15,400,000	326,250	$26,100,000
>12	5,000	3.0	9	3.5	17,500	$1,400,000	343,750	$27,500,000

Targeted depths based on Arroyo Grande channel contours. Cost based on $80/cubic yard for excavation and disposal.

3 RPA 3 RESTORATION PROJECT ALTERNATIVES

The language of RPA 3 was finalized based on agreement between the District and NMFS to pursue a restoration project in Meadow Creek Lagoon in place of NMFS' preferred approach of including levee setback as part of the WMP action (refer to further discussion of this in Section 4). RPA 3 accommodates modifications to the proposed restoration project and provides for a process to evaluate other alternatives:

"The principal objectives of the District's proposal, ***subject to modification*** *during the science panel, California Environmental Quality Act, and government approval process described below, involve setting back or removing 1000-ft of levee in the vicinity of these lagoons (within the action area)* ***or*** *relocating* ***or*** *removing tidal gates,* ***or*** *a combination of these, and converting 8.28 acres of land owned by the District and California Department of Parks and Recreation ("State Parks") to wildlife habitat. . . In support of the restoration goal, the District agrees to implement a* ***preliminary design approach that includes an alternative analysis and environmental review of a preferred alternative****."*

With the determination that the envisioned levee setback alternative is not feasible, the District proposes to continue with the RPA 3-stipulated design approach by analyzing three potentially viable restoration project alternatives with the goal of identifying a feasible solution that will fulfill the District's obligations under RPA 3.

Absent a specific project design, the RPA 3 restoration **goals** are ". . .for the purposes of increasing habitat for growth and survival of smolt and rearing steelhead and enhancing and protecting the lagoon wildlife and fisheries habitat into the future."

From the preliminary matrix of alternatives, the District has identified three alternatives that have the potential to accomplish RPA 3 goals, including:

Alternative 3: Meadow Creek Lagoon Enhancement

- Connect Arroyo Grande channel with floodplain in Meadow Creek Lagoon
- Expand/enhance riparian buffer in Meadow Creek Lagoon
- Create complex creek channels and deep pools for juvenile rearing habitat in Meadow Creek Lagoon

Alternative 4: Arroyo Grande Lagoon Enhancement

- Create enhanced floodplain in Arroyo Grande Lagoon
- Create complex creek channels in Arroyo Grande Lagoon
- Create floodplain rearing habitat for juveniles in Arroyo Grande Lagoon
- Potential additional benefit to migration habitat from improved channel complexity and cover

Alternative 5: Improved Connection Between Upper and Lower Meadow Creek Lagoon

- Connect Arroyo Grande channel with floodplain in Meadow Creek Lagoon

- Create complex creek channels in Meadow Creek Lagoon
- Connect juveniles to rearing habitat in Upper Meadow Creek Lagoon

Based on the preliminary analysis of alternatives strengths and weaknesses, there is no ideal habitat restoration solution. Potential downsides to these alternatives exist, including, for example, potential for dry conditions to persist in summer in Arroyo Grande Lagoon (Alternative 3), and the likely need for invasive species management in Meadow Creek Lagoon (Alternatives 4 and 5). The proposed modeling and ecological assessment will investigate the strengths and weaknesses of these alternatives in more detail to help determine which alternative provides the greatest ecological benefits for steelhead and other wildlife, in addition to meeting the RPA stipulations at 50 C.F.R. § 402.02.

Based on the bulleted lists above, the District believes there is potential to identify a preferred alternative from these alternatives that meets the RPA 3 goals. In the event that is not the case, the District would agree to considering other restoration options in the Arroyo Grande Creek system.

4 ORIGIN OF THE 8.28 ACRE RESTORATION AREA

NMFS' initial goal for the draft RPA was that the District accomplish levee setback in the WMP Action Area to relieve Arroyo Grande Creek channel confinement and provide wider riparian buffers.

This is summarized in RPA 3: "As a result [of the effects analysis], RPA sub-element 2 of the draft biological opinion stipulated the District would implement an alternative that involved levee removals and setbacks for the purpose of obtaining the District's flood -control objective. However, through our joint effort with the District to refine the draft RPA, including sub-element 2, the District has proposed to restore historic connectivity between Meadow Creek Lagoon and Arroyo Grande Creek Lagoon for the purposes of increasing habitat for growth and survival of smolt and rearing steelhead, and enhancing and protecting the lagoon wildlife and fisheries habitat into the future (hereafter referred to as the "restoration goal")."

The District determined that levee setback in the WMP Action Area would be technologically and economically infeasible because the Action Area is bordered by private property and established agricultural operations. The District proposed the Meadow Creek Lagoon habitat restoration project because it would accomplish the specific objectives that NMFS was targeting for the Action Area, namely relieving channel confinement through a potential levee setback and/or restoring connection to broad riparian/floodplain habitats. NMFS concurred that the Meadow Creek Lagoon project would "support steelhead smolt production by restoring historic lagoon-rearing habitat that was once available to the species" (NMFS 2017b).

The Meadow Creek Lagoon restoration area was selected and drawn on a map based on a sizable area of open space generally considered to have lower habitat value with

predominantly public ownership. The restoration polygon was drawn in the District's online mapping tool, GeoWorks, based on the location of the levee and surrounding developed land, and the resulting acreage was 8.28 acres. The size of the restoration area was not based on any quantitative link with WMP impacts or a quantitative requirement in the BO. Designating the 8.28-acre area also did not consider engineering feasibility, constraints, or detailed environmental analysis (e.g., conflicts with existing infrastructure, appropriate property line setbacks, the relocated levee footprint, etc.). Such detailed analyses are a requirement of RPA 3.

The Sanitation District provided a letter of general support for the District to consider RPA 3 in 2018. However, because the levee setback alternative would increase flooding impacts and would have significant interference with their existing and ongoing operations, it is understandable that they have stated objections to use of their property. They have recently indicated by email (Sanitation District 2022b) that they are opposed to restoration activities occurring on the portion of the 8.28-acre restoration area that is on their property (approximately 2 acres; Figure 5).

Removing the approximate 2 acres of land owned by the Sanitation District from the proposed restoration area would reduce the area of land proposed to be converted to wildlife habitat. However, as noted above, the proposed area for conversion was not based on a quantitative requirement in the BO. Additionally, as described in Section 2.2 and shown in Figure 4, this portion of the lagoon increases considerably in elevation. To convert this entire area to lagoon habitat (e.g., as part of Alternative 3, Meadow Creek Lagoon Enhancement), over 300,000 cubic yards of soil would need to be removed at an estimated cost of tens of millions of dollars (Table 1). The District expects that through project development, the removal of this area from consideration as part of a restoration alternative will not adversely affect the ecological benefits that can be attained from proposed Alternative 3.

Figure 5. Sanitation District property boundary in Meadow Creek Lagoon.

5 RESTORATION PROJECT SCOPE

Finally, based on Science Panel discussions pertaining to limitations of the hydrologic conditions in the restoration alternatives, this Report is a useful place for the District to revisit and remind the USACE, NMFS, and Science Panel members of specific scope agreements in the BO.

The District conveyed its concerns related to the Meadow Creek Lagoon Habitat Restoration project to the USACE by letter dated July 24, 2017, regarding "three important issues that . . . must be fully understood and incorporated into RPA Element 3 for this RPA to be technologically and economically feasible, reasonable, viable, and capable of being implemented" (District 2017). The first two issues pertained to the District's inability to commit at that time to a predetermined and preferred alternative for Lagoon Restoration, as well as its funding and schedule.

The third issue pertained to management actions recommended by NMFS that were to be removed and considered as separate Conservation Recommendations in the BO. There are seven such Conservation Measures in the BO, three of which pertain directly to physical conditions in the restoration area:

> Conservation Measure 1: Monitor for the following physical processes that affect habitat conditions such as sedimentation, algal blooms, nutrient loading, and over-population of domestic waterfowl.
>
> Conservation Measure 2: Address and resolve groundwater extraction management issues that currently have measurable effects to suitable rearing habitat conditions in the existing Arroyo Grande Creek lagoon and the future restored lagoon as described under RPA sub-element 3.
>
> Conservation Measure 3: Sustainably manage groundwater resources, ensure sufficient freshwater input into the restored lagoon complex to avoid anoxic conditions, and mimic natural frequency and duration of open/closed lagoon cycles.

This makes clear that actions to actively manage or supplement the hydrology in the restoration area are outside the scope of the restoration project. Hydrologic improvements in the Arroyo Grande Creek and Lagoon and in Meadow Creek Lagoon may have benefits, with or without the restoration project, but are not reasonable to be included as part of the District's requirements under RPA 3.

The remaining alternatives proposed for more detailed analysis, described in Section 3, would not preclude implementation of the BO Conservation Measures. As opportunities for funding the Conservation Measures arise, they are expected to result in enhancement of habitat conditions for each of the remaining alternatives. The preliminary alternatives screening concluded that, even without implementation of the Conservation Measures, each of the three remaining alternatives has the potential to provide improved steelhead habitat conditions. The specific improvements would be confirmed by the proposed modeling effort.

Additionally, Section 2.2 of this report describes likely funding challenges for permitting and construction of a restoration project, and provides an example of how increasing project scale can result in rapidly escalating construction costs (Table 1). The Arroyo Grande Creek WMP cost $8.5 M. The District contends that there must be some reasonableness in determining a feasible restoration solution to replace the project envisioned in RPA 3, including reasonable costs and likelihood of being funded.

Similarly, Section 5 of this report explains how the 8.28 acre RPA 3 project area was identified; it was not based on a quantification of WMP effects or a quantitative requirement in the BO. The District does not believe that it should be accountable to implement a project that restores 8.28 acres, but that it should be accountable to pursue implementation of a feasible, reasonable project, that accomplishes the habitat improvement goals of RPA 3.

6 NEXT STEPS

Based on the information provided in this report, the District proposes to continue with the RPA 3 directives, including:

- Completing the preliminary design approach (alternatives analysis and environmental review) to include:
    - Hydraulic modeling and evaluation of ecological benefits for the three remaining alternatives;
    - Selection of a preferred alternative;
    - Completion of an Integrated Feasibility Report/Environmental Impact Report, with NMFS review and comment, to be certified by the County Board of Supervisors; and
- Permitting, funding, and construction of the restoration project.

The District is committed to adhering to the RPA 3-stipulated timeframes to the extent possible and is ready to proceed with the modeling task. The District requests Corps/NMFS concurrence on this approach prior to advancing project development and spending finite project funds and will wait for Corps/NMFS direction prior to proceeding.

7 REFERENCES

County of San Luis Obispo Flood Control and Water Conservation District, 2017. Letter to USACE conveying concerns regarding NMFS draft Biological Opinion. July 24.

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