



## DRAFT MEMORANDUM

FC 14 (01-02-07)

**TO:** Rechelle Blank

**FROM:** Clayton Leal

**SUBJECT:** Fisheries Benefits of Almaden Lake

**DATE:** September 28, 2017

Currently, Almaden Lake is a 32-acre in-channel impoundment on Alamos Creek. Alamos Creek, as well as Guadalupe Creek and the downstream Guadalupe River, supports federally threatened Central California Coast (CCC) steelhead (*Oncorhynchus mykiss*) and other native fish species. Impaired water quality, risk of entrainment (fish getting lost in the lake rather than migrating upstream or downstream), and predation from nonnative predatory fish species within Almaden Lake result in potential non-physical barriers to passage, conditions which can imperil native fish, and degrade aquatic habitat conditions downstream. The proposed Project provides benefits to fisheries and to overall ecosystem function within the Project area (both riverine and lacustrine) that extend upstream into Alamos and Calero Creeks and downstream through the mainstem of the Guadalupe River and even has fringe benefits to fish migrating upstream to Guadalupe Creek. The wide-reaching benefits of this Project will help maintain healthy anadromous fish populations throughout the watershed and restore function to a section of creek that has been impaired for over 50 years.

**Improved anadromous fish passage** - The proposed restored Alamos Creek channel through the Almaden Lake footprint would help ameliorate fish passage conditions by reducing the area of potential entrainment, providing attraction flows for upstream migration, and allowing flow pulses to facilitate juvenile fish migration during downstream migration. The improved passage conditions will allow unimpeded access to over 6.5 miles of Alamos Creek and over 3.0 miles of Calero Creek. Though the impoundment behind the flashboard dam will remain, it only occurs seasonally (April-December), and not during the peak of adult steelhead up-migration (December-April) and only for portions of the Juvenile outmigration (December-June) when this species is most vulnerable to entrainment.

**Increased and improved riverine habitat** - The restored channel will also facilitate natural sediment transport, allowing for movement of spawning gravel and the creation of a geomorphically stable channel. Natural sediment dynamics will facilitate the development of aquatic habitat features that are essential to suitable habitat for native fish, such as deposition of gravel for spawning, pools for rearing, and riffles for food production.

**Reduced predation** - The Project also reduces the risk of predation by excluding native fish from the large lacustrine habitat (i.e., Almaden Lake) preferred by nonnative predatory fish and replacing it with riverine habitat that is not as conducive to the life history requirements of nonnative predatory species. Of approximately 1,700 linear feet (0.32 miles) of creek section proposed for restoration, about 100 linear feet will remain as an impoundment when the flashboard dam is in place. This impoundment will be significantly reduced in depth since the restored creek section invert will be brought up and not be at the original depth of the lake. As mentioned earlier, the impoundment is only in place seasonally and not during the entire juvenile steelhead out-migration period, which limits their potential interaction

with non-native predatory fish within the impounded area. At times when the flashboard dam is not in place the restored creek section will function as continuous riverine habitat.

**Reduced water temperature** - In a natural river system cool water from headwater streams flows downstream and gradually warms. Shading by riparian vegetation and natural riverine processes moderate that warming. In the presence of Almaden Lake, the cool water is captured in the lake and due to the varied depths within the lake and the lake's large surface area to volume ratio, the water is heated to levels that can reduce reproductive success of salmonids and rearing potential (Jones & Stokes, 2004). In an inverse of what is seen in a natural system, riparian shading and natural riverine process cools water from Almaden Lake as it moves downstream. By removing the warming influence of the lake and allowing water to flow through the restored river channel, the impacts associated with warming will be reduced in the lake and downstream Guadalupe River. The river will see a more natural temperature regime and conditions for native fish will be improved. Warming will still occur when the flashboard dam is in place, but it will be less than what is currently experienced. In 2004, Jones and Stokes modeled temperature under multiple scenarios of creek/lake separation. The modeled scenario that most closely relates to the current plan was defined as a "shaded short bypass," that uses a 0.4 mile long bypass channel through the lake bed. This scenario takes into consideration the operation of the flashboard dam. This study modeled an average monthly reduction, after vegetation is established, of up to -8.3°F within the lake footprint and -0.6°F three miles downstream (Jones and Stokes 2004). This modeling effort did not take into consideration many of the current Project attributes, such as length of bypass, establishing natural riffle/run/pool complexes mimicking upstream conditions, and establishing riparian shading along the stream margins, which will further aid in establishing natural hydraulic function. Since the model does not take into consideration Project specific attributes and the bypass channel is longer, it is predicted that the results presented are a conservative estimate of the temperature benefits associated with the creek/lake separation. The numbers generated from the model do not show a significant change in temperature three miles downstream, but the temperature was predicted to reduce. This model should be used as a prediction of the positive effects of the Project, but the actual temperatures variation is unknown.

**Benefits to lacustrine fish** - The Project will modify the existing lakebed which will have direct benefit to lacustrine fish. Though fish commonly associated with Lake are nonnative, they still provide recreational opportunity to anglers and serve as a food source of piscivorous birds. The modification of the existing lake bottom will improve water quality conditions and reduce areas of anoxia. This improvement not only creates better habitat and less stressful conditions for fish, but greatly reduces methyl mercury production and depending on water source options, may eliminate disposition of mercury from upstream sources. This not only improves the overall health of the aquatic-to-terrestrial food chain, but could reduce advisories associated with human consumption of recreationally caught fish.

**Improved ecosystem function** - The creek/lake separation also creates new lake and stream margins that will be graded and appropriately planted with native species to result in an increase of wetland, riparian, and upland vegetation. This increase in vegetation, particularly of native species that are appropriate for the restored conditions, will enhance the functions associated with these vegetation types. This includes, among other things: removal of water nutrients and addition of dissolved oxygen by lake margin vegetation, which will in turn reduce the potential of algal blooms; slowing and sequestering runoff and associated pollutants and fine sediment before it enters the creek and lake; supplying the channel with woody debris and leaf litter that are essential to fish habitat and the aquatic food web; dampening noise from adjacent urban land uses; expanding habitat for many species of birds, reptiles, and amphibians; creating pockets of suitable food sources for native pollinators and monarch

butterflies; and providing movement and refuge habitat for mammals that is continuous with the upstream Alamos Creek corridor and watershed. Taken together, these improved functions will help create a naturally functioning ecosystem that is aesthetically pleasing and offers improved recreation and educational opportunities.

## **Reference**

Jones & Stokes, 2004. *Simulated Water Temperature Effects of Bypassing Almaden Lake*. Prepared for the U.S. Army Corps of Engineers, July 2004.

Cc: Zooey Diggory  
James Ujah  
Michael Martin  
Lisa Porcella



## MEMORANDUM

FC 14 (01-02-07)

**TO:** Rechelle Blanks

**FROM:** Clayton Leal

**SUBJECT:** Recreation Benefits of Almaden Lake

**DATE:** October 2, 2017

Almaden Lake Park (Park) is a 65-acre facility with 32 acres of lake featuring many recreational opportunities, including paddle boating, picnicking, walking/running, biking, volleyball, horseshoes, bocce ball, and dog walking. Recreational facilities include playgrounds, picnic areas, bocce courts, paved trails, a beach area on the west shore of the lake, and a 75-seat amphitheater near the southeast shore of the lake. There are large green open lawns and picnic areas with barbeque pits. Tot lots are located at both sides of the park and feature water play areas (City of San José, 2015a, 2015b). Paved trails within the Park include the Lake Almaden Trail adjacent to the eastern lake shore and the Oak Hill Trail along the southern end of the Park. Both trails connect to the regional trail network. In addition to supporting a variety of recreational activities, the Park also includes an existing island located in the south-central portion of the lake that supports bird populations. The proposed Almaden Lake Improvements Project (Project) will maintain the recreational aspects on either side of the Park as well as provide new opportunities and improve current conditions for the community.

**New trails and walking path** - The Project will create a new trail network along the levee used to create the creek/lake separation. This trail, designated for pedestrian use only will create a scenic walking area that allows opportunity for bird watching, observing the restored river channel, and walking without the risk associated with higher speed recreation activities (biking, skating, and rollerblading). The new trails will include benches for relaxing and picnicking. This trial will tie into the existing, and highly used Los Alamitos Creek and Guadalupe River trails, enhancing opportunities for visitors to navigate the Park and exercise, and contributing to a world-class urban trail system.

**Enhanced bird and wildlife watching opportunities** - The proposed island reconfiguration and the construction of a new island in the preserved lake will create beneficial habitat for migratory birds and bird watching opportunities for the public. This island habitat will create new opportunities for birdwatchers and could provide educational opportunities for local school children to see new species and gain an understanding of ecosystem functions. These islands will not only provide recreation opportunities for naturalists, but will serve as additional complexities and attractions to those renting paddle boats. The development of a riparian corridor and other native habitat types along the restored creek channel and floodplain will also increase habitat for birds, as well as other native wildlife such as deer, further enhancing bird and wildlife watching opportunities.

**New parklands and green space** - The establishment of new parklands along the west side of the park will create additional attractions or educational opportunities for Park visitors.

**Water quality improvements** - The Project will modify the existing lakebed which will directly benefit water quality. The recontouring and capping of the lake bottom will reduce varied depths and areas of deep water which will reduce areas of summer anoxia (low or zero dissolved oxygen) that lead to methylmercury production. This will not only improve the ecological health of the aquatic-to-terrestrial food chain in the lake but could reduce methyl mercury entering San Francisco Bay. This improvement would create a less eutrophic lake (with less algal blooms), which would result in a more aesthetically pleasing environment which could increase angler desire to fish at the lake, providing urban anglers a fishing opportunity close to home. The creek/lake separation also creates new lake and stream margins that will result in an increase of wetland, riparian, and upland vegetation. This increase in vegetation, will enhance the functions associated with these vegetation types. This includes, among other things: removal of water nutrients and addition of dissolved oxygen by lake margin vegetation; and slowing and sequestering runoff and associated pollutants and fine sediment before it enters the creek and lake. This could help reduce toxic algal blooms and other water quality issues that contribute to the human contact restrictions at the lake. The expected water quality improvements have the potential to enhance recreational opportunities for anglers, boaters, and create an overall more inviting waterscape for visitors.

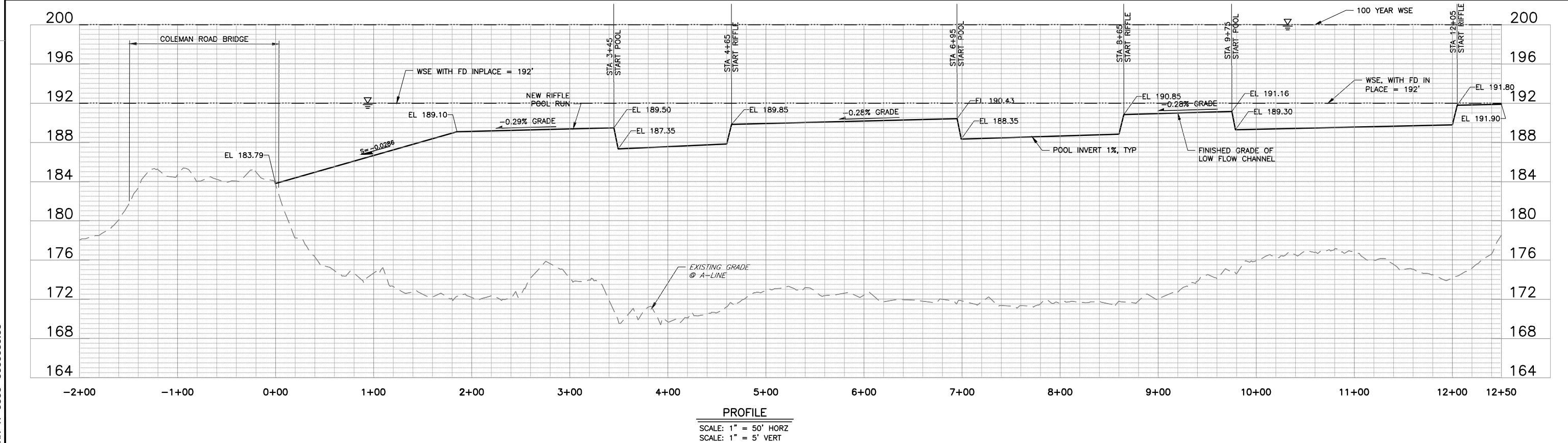
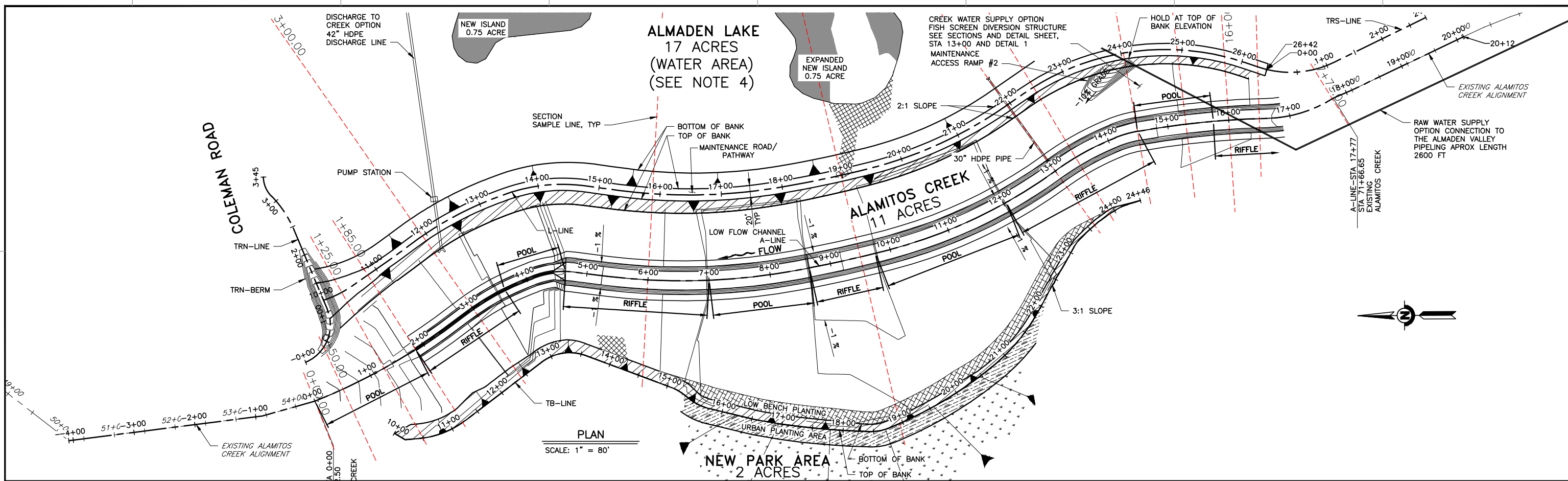
## References

City of San José, 2015a. Almaden Lake Amphitheater. Available online at: <http://www.sanjoseca.gov/Facilities/Facility/Details/13>. Accessed on September 28, 2017.

City of San José, 2015b. Almaden Lake Regional Park. Available online at: <http://www.sanjoseca.gov/facilities/facility/details/2>. Accessed on September 28, 2017.

Cc: Zoey Diggory  
James Ujah  
Michael Martin

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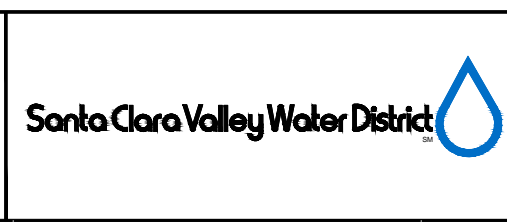


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**"DRAFT"**  
**PLANNING DRAWING**  
2017/10/02

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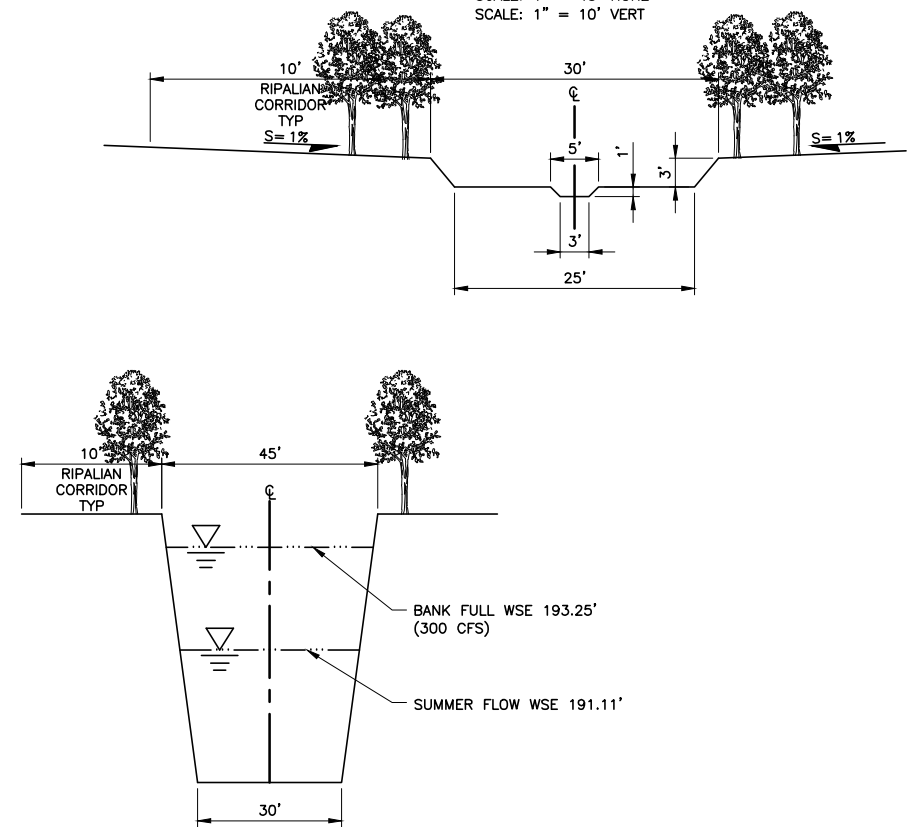
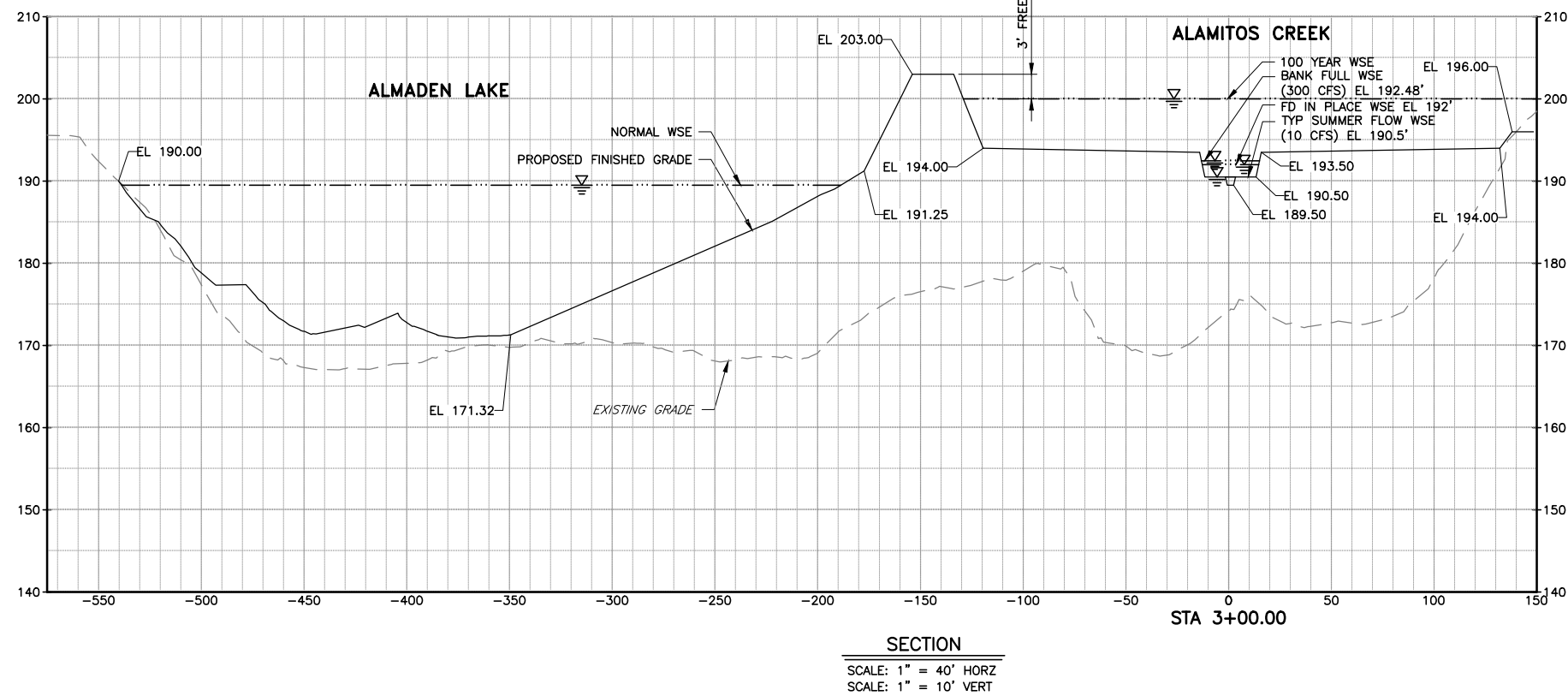
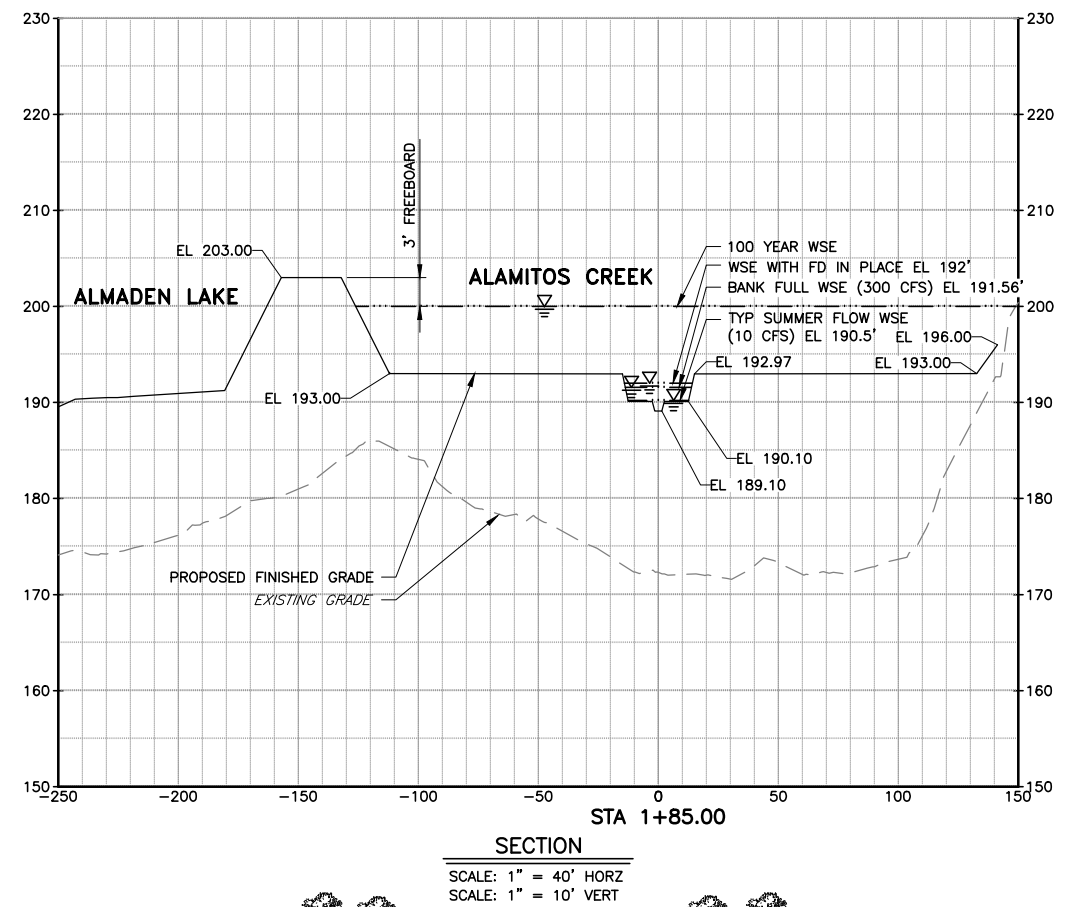
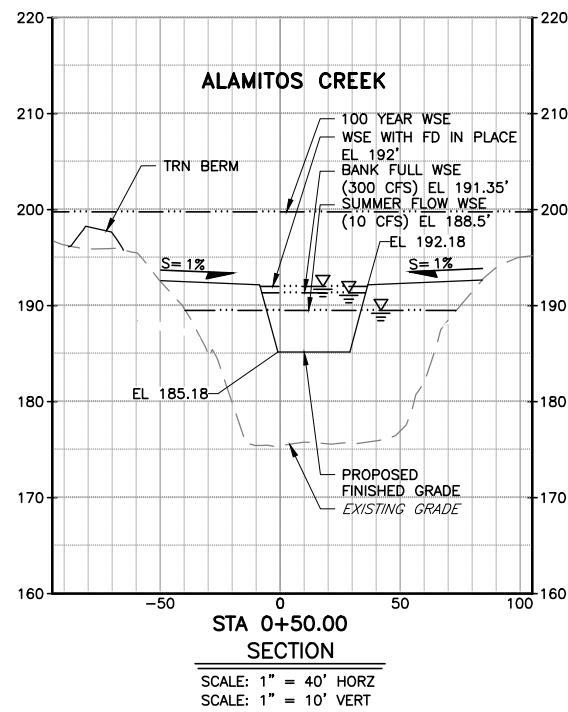
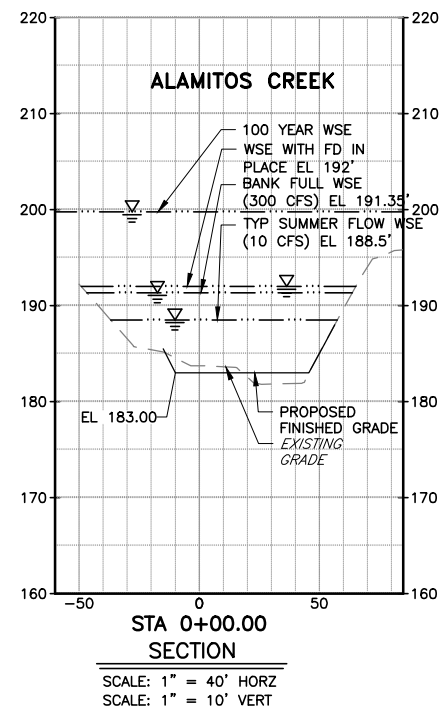
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 DRAWN: X.X.X.  
 CHECKED: X.X.X.  
 PROJECT ENGINEER: [ ] DATE: [ ]



PROJECT NAME AND SHEET DESCRIPTION:  
**ALMADEN LAKE IMPROVEMENT PROJECT**  
 ALTERNATE 6  
 PLAN AND PROFILE

SCALE: 1" = 80'  
 VERIFY SCALES: [ ]  
 PROJECT NUMBER: 26044001  
 SHEET CODE: EX-01  
 SHEET NUMBER: XX OF XX

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**"DRAFT"**  
**PLANNING DRAWING**  
 2017-11-01

- REFERENCE INFORMATION AND NOTES
1. TYPICAL SUMMER FLOW 10 CFS
  2. BANK FULL FLOW 300 CFS
  3. LAKE OPERATING WSE (WATER SURFACE) EL 188'-190'
  4. WSE (WATER SURFACE) WITH FB (FLASHBOARD) IN PLACE EL192'

DATE	ENGINEERING CERTIFICATION
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DESIGN	
X.X.X.	
DRAWN	
X.X.X.	
CHECKED	
X.X.X.	
PROJECT ENGINEER	DATE

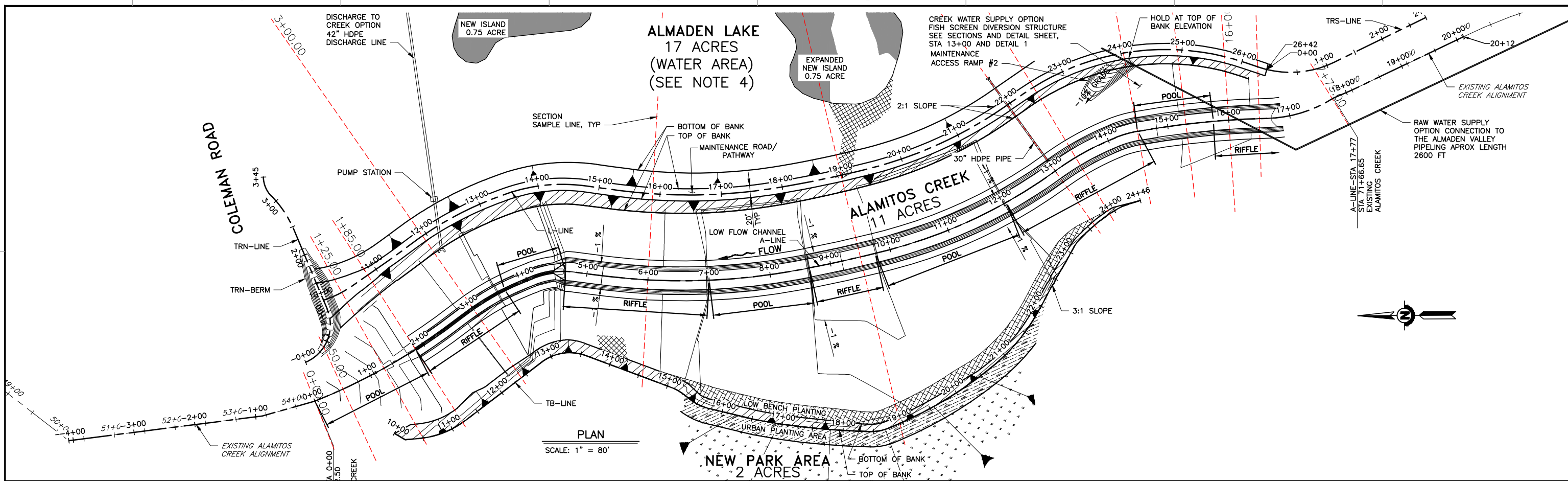


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**ALMADEN LAKE IMPROVEMENT PROJECT**  
 ALTERNATE 6 SECTIONS

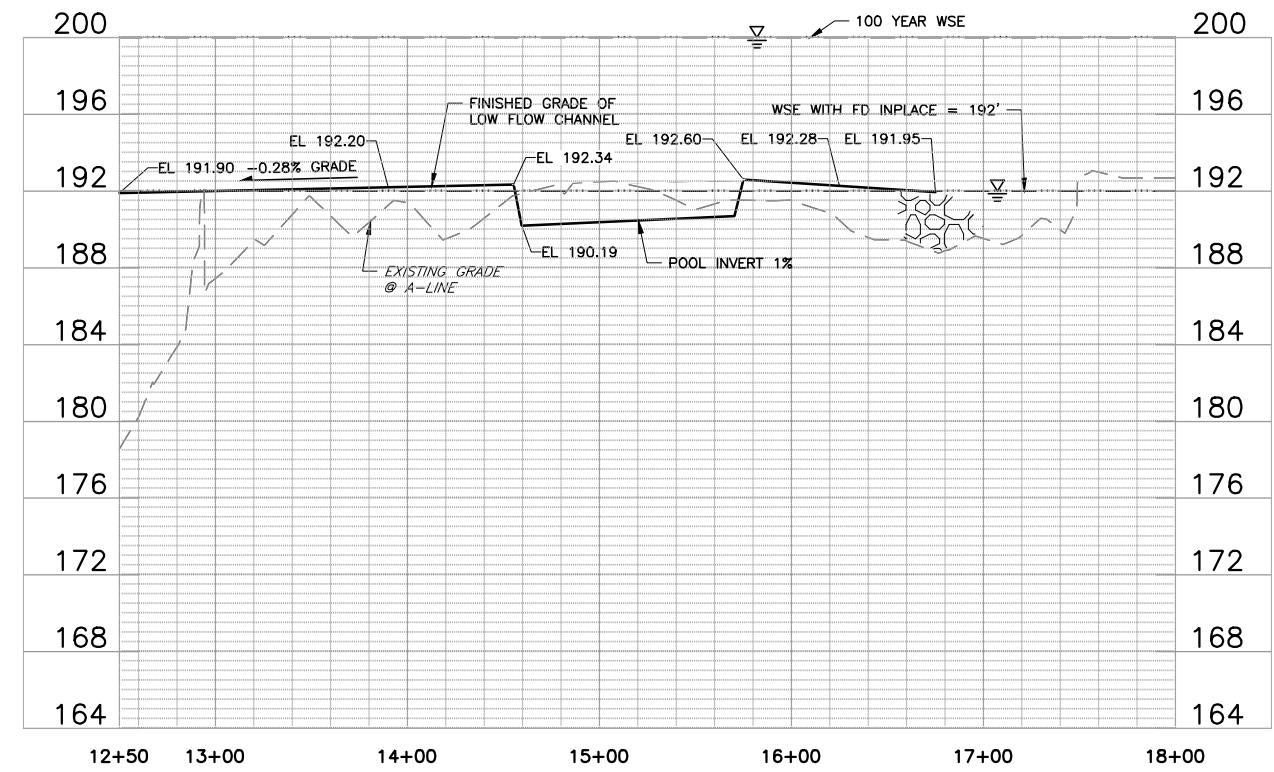
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AS SHOWN	26044001
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	SHEET NUMBER: XX OF XX

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DOCUMENT NUMBER: XXXX-X-0000-00000000.00



PLAN  
 SCALE: 1" = 80'



PROFILE  
 SCALE: 1" = 50' HORZ  
 SCALE: 1" = 5' VERT

REV	DESCRIPTION	DATE	APPR.	REFERENCE INFORMATION AND NOTES	DATE	ENGINEERING CERTIFICATION	PROJECT NAME AND SHEET DESCRIPTION:	SCALE	PROJECT NUMBER	
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									SHEET NUMBER: XX OF	



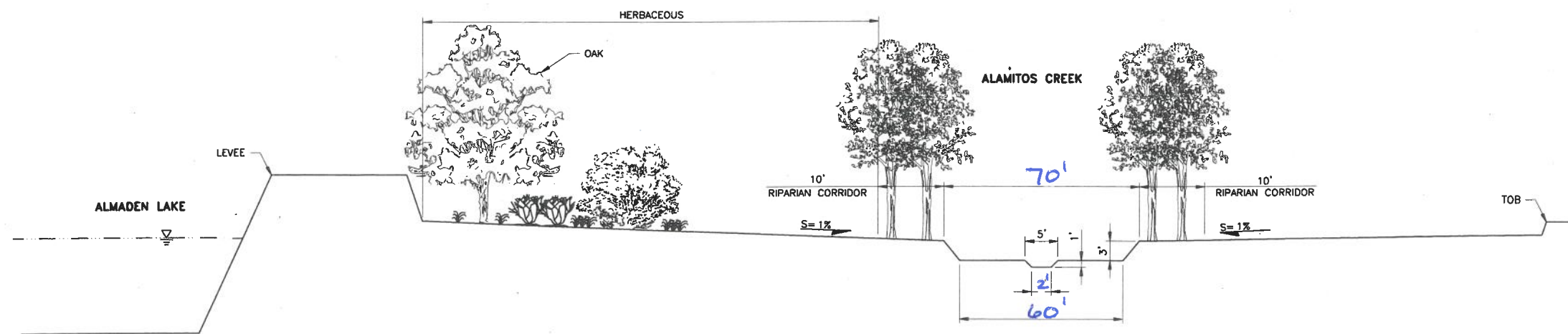


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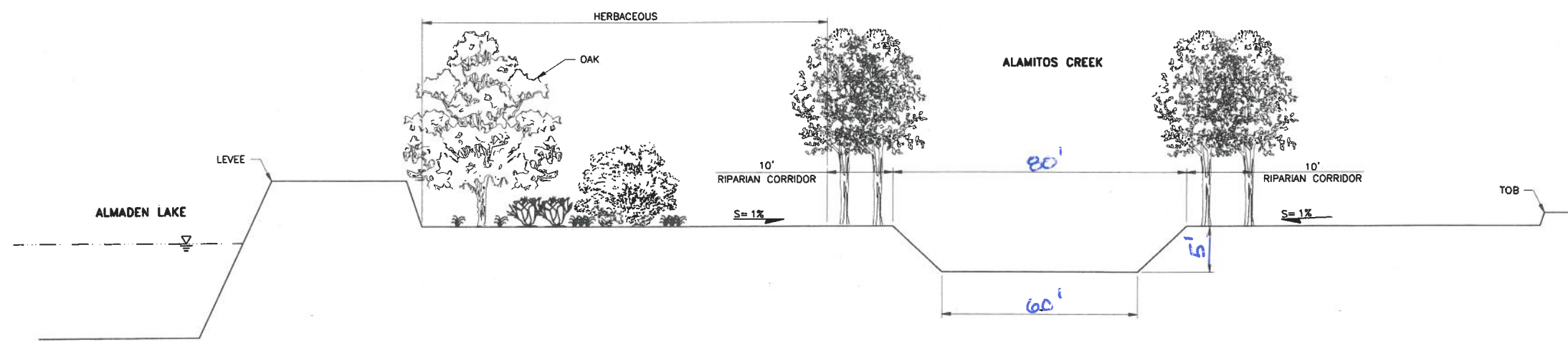
Answers to Q1 + Q2.

width varies 20' - 85'  
 Eastern Flood plain

width varies 30' - 230'  
 Western Flood plain



DETAIL 1 TYPICAL RIFFLE DETAIL  
 SCALE: 1" = 10'



DETAIL 2 TYPICAL POOL DETAIL  
 SCALE: 1" = 10'

NOTE:  
 1. RIPARIAN ZONE SPECIES TO  
 CONSIST OF COTTONWOOD, TYP

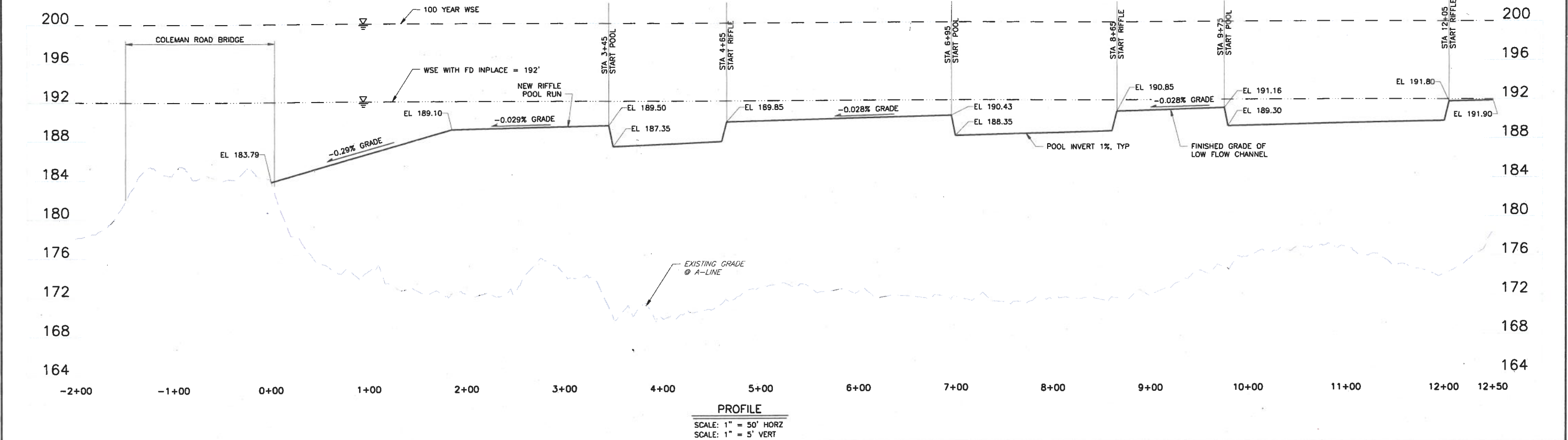
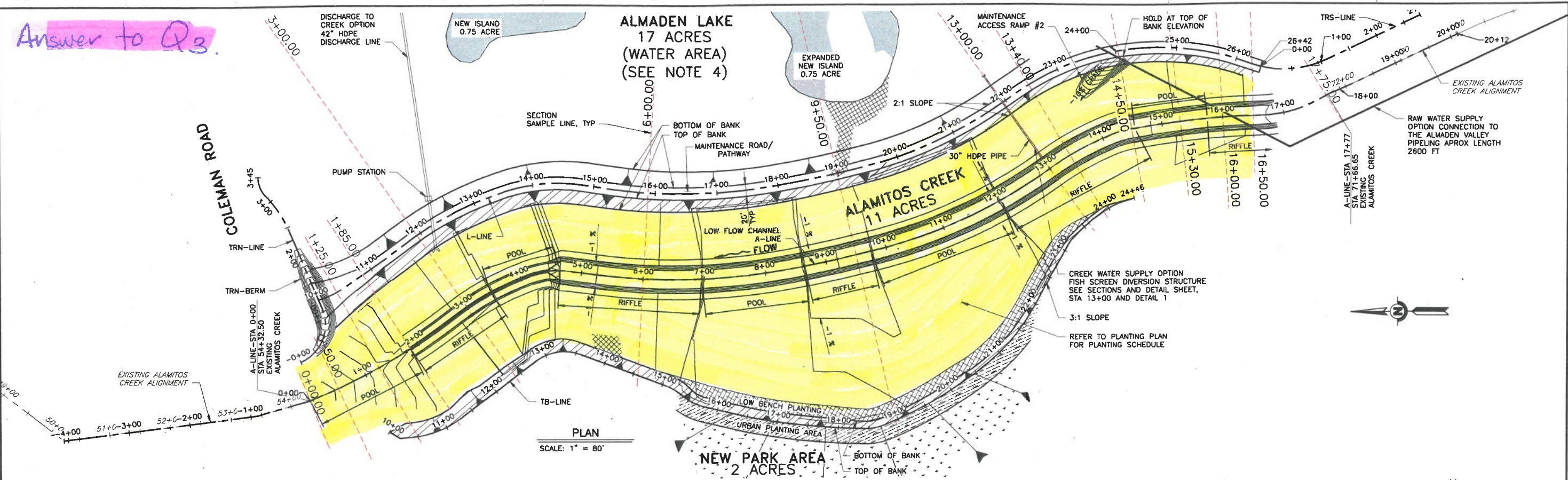
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Answer to Q3.



DOCUMENT NUMBER: XXXX-X-0000-0000000.00

REV	DESCRIPTION	DATE	APPR.	REFERENCE INFORMATION AND NOTES	DATE	ENGINEERING CERTIFICATION	PROJECT NAME AND SHEET DESCRIPTION:	SCALE	PROJECT NUMBER	
	<b>"DRAFT"</b> PLANNING DRAWING 2017/10/02			1. ALMADEN LAKE OPERATING WSE (WATER SURFACE ELEVATION) IS 188'. 2. USE WITH FD (FLASHBOARD DAM) IN PLACE IS 192'.	MAR 2013		<b>ALMADEN LAKE IMPROVEMENT PROJECT</b>  ALTERNATE 6 PLAN AND PROFILE	1" = 80'	26044001	
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										SHEET NUMBER: XX OF XX

**From:** Christopher Hakes  
**To:** [Lichten.Keith@Waterboards](mailto:Lichten.Keith@Waterboards)  
**Subject:** RE: Upper Berryessa (Follow Up)  
**Date:** Monday, August 28, 2017 1:26:39 PM  
**Attachments:** image001.png  
Almaden Lake.pdf

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Keith,

Attached is additional information on the Almaden Lake project. This project would enhance at least 28 acres of waters, which is well more than the 15 acres referred to in the WDR for Upper Berryessa. While we can agree to disagree on whether any part of that enhancement should be characterized as mitigation for Upper Berryessa, I hope this information suffices for the Regional Board's purposes. By September 5, please let me know whether the District should expect to receive a non-enforcement letter for Upper Berryessa. If you have any questions, or need any additional information about the Lake Almaden project before September 5, please let me know.



**CHRISTOPHER HAKES, P.E.**  
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5750 Almaden Expressway, San Jose CA 95118  
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[chakes@valleywater.org](mailto:chakes@valleywater.org)  
[www.valleywater.org](http://www.valleywater.org)

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**From:** Lichten, Keith@Waterboards [mailto:Keith.Lichten@waterboards.ca.gov]  
**Sent:** Wednesday, August 23, 2017 9:05 PM  
**To:** Christopher Hakes <CHakes@valleywater.org>  
**Subject:** RE: Upper Berryessa (Follow Up)

Chris,

This email follows up on our phone conversation this afternoon about the District's development of a potential project list and workplan for submittal pursuant to the Upper Berryessa order. You had attached an excerpt from the Safe, clean water and natural flood protection project's FY 2016-17 annual report, "Project D4, Fish Habitat and Passage Improvement."

It looks like the Project D4 excerpt includes projects that could be acceptable, in some cases with modification. We would be interested to see:  
descriptions separated into individual projects  
the descriptions could be quite brief, but they should describe or otherwise gesture towards the expected project work and associated benefits to be gained from the project. For example, the Lake Almaden work appears to describe a "lake separation" project; our comments on that project have been that it should consider addressing the physical and temperature barrier created by the

percolation pond diversion structure there. So a description would indicate that specific work (and generally other work associated with the project) and that it would be expected to significantly improve access to X miles of habitat upstream, plus, if available, a description of the habitat. You might take a similar approach to the Coyote Creek percolation pond dam, Ogier Ponds, potential modifications to the District's Lower Berryessa Project, etc.

they should indicate in a quantitative manner (could be a rough estimate) the benefits to be gained (e.g., reopening fish access to X miles of upstream habitat, enhancement of Y linear feet of Lower Berryessa Creek, etc.)

As we discussed, the projects should be ones that have not already been constructed and which are otherwise not already required as permit conditions.

The proposed project list should be for implementation projects that will result in on-the-ground improvements to beneficial uses. While studies could be part of a proposed project, an acceptable project will need to result in on-the-ground improvement.

The workplan should include tasks and a proposed schedule sufficient to take the projects from the conceptual stage to implementation and monitoring. The excerpt's schedule is at a low level of detail (e.g., showing Lake Almaden planning as occurring for 3 fiscal years, from 2016-18, and design from 2017-19) that does not make clear how the District would take a project through the process. For example, what are the stages of planning and design? What are the tasks associated with budgeting, permitting, construction, and monitoring? While exact tasks associated with a particular project may not be available at this stage, the District should have typical tasks, a punch list sort of approach to project planning and implementation, with a projected schedule, including estimated dates for construction completion, and the workplan should reflect that. If there are particular tasks (e.g., obtaining approvals from water rights for Lake Almaden-related work) that are known or likely to be significant, it may make sense to mention them. There's a degree of art in getting to a reasonable level of detail, and we can certainly discuss that.

I will be in meetings or out of town Thursday afternoon and Friday, but will be returning next week. I will forward this email to Susan, Xavier, and Bruce so that they're aware of the ongoing discussion.

Regards,

-Keith

-----Original Message-----

From: Christopher Hakes [<mailto:CHakes@valleywater.org>]

Sent: Wednesday, August 23, 2017 3:47 PM

To: Lichten, Keith@Waterboards <[Keith.Lichten@waterboards.ca.gov](mailto:Keith.Lichten@waterboards.ca.gov)>

Subject: RE: Upper Berryessa (Follow Up)

For our discussion.

CHRISTOPHER HAKES, P.E.

ASSISTANT OPERATING OFFICER  
Capital Division  
Water Utility Enterprise  
Santa Clara Valley Water District  
5750 Almaden Expressway, San Jose CA 95118  
(408) 630-3796  
[chakes@valleywater.org](mailto:chakes@valleywater.org)  
[www.valleywater.org](http://www.valleywater.org)

-----Original Message-----

From: Christopher Hakes  
Sent: Wednesday, August 23, 2017 2:29 PM  
To: Lichten, Keith@Waterboards <[Keith.Lichten@waterboards.ca.gov](mailto:Keith.Lichten@waterboards.ca.gov)>  
Subject: RE: Upper Berryessa (Follow Up)

Keith,

If you're still open I'll give you a call at 4 pm today.

CHRISTOPHER HAKES, P.E.  
ASSISTANT OPERATING OFFICER  
Capital Division  
Water Utility Enterprise  
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5750 Almaden Expressway, San Jose CA 95118  
(408) 630-3796  
[chakes@valleywater.org](mailto:chakes@valleywater.org)  
[www.valleywater.org](http://www.valleywater.org)

-----Original Message-----

From: Lichten, Keith@Waterboards [<mailto:Keith.Lichten@waterboards.ca.gov>]  
Sent: Tuesday, August 22, 2017 9:17 AM  
To: Christopher Hakes <[CHakes@valleywater.org](mailto:CHakes@valleywater.org)>  
Subject: RE: Upper Berryessa (Follow Up)

Chris,

I'm available tomorrow after 3:45 pm. 4 pm might be a bit better in case the earlier meeting goes long.

We can commit to an expeditious review of anything you send over. We're not looking to let any grass grow under our feet on it. We can discuss more tomorrow, if you'd like.

-Keith

-----Original Message-----

From: Christopher Hakes [<mailto:CHakes@valleywater.org>]

Sent: Tuesday, August 22, 2017 7:09 AM

To: Lichten, Keith@Waterboards <[Keith.Lichten@waterboards.ca.gov](mailto:Keith.Lichten@waterboards.ca.gov)>

Subject: RE: Upper Berryessa (Follow Up)

Keith,

Unfortunately my afternoon has filled up. Are you available tomorrow after 3?

Chris

---

From: Christopher Hakes

Sent: Thursday, August 17, 2017 4:14 PM

To: 'Keith.Lichten@waterboards.ca.gov'

Subject: Upper Berryessa (Follow Up)

Keith,

Thanks for taking the time to talk yesterday afternoon. I've got time available on Tuesday or Wednesday after 3 pm next week to continue or discussions. Would either of those day/times work for you.

On a related note, once the District has something ready for submission, would it be possible to review and return the proposal within 7 days after receipt? That way (as long as we submit in a timely fashion) we would know in advance of the October 2nd deadline if we had meet the 401 requirements?

[\[cid:image001.png@01D31773.D9FF4720\]](#)

CHRISTOPHER HAKES, P.E.

ASSISTANT OPERATING OFFICER

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Santa Clara Valley Water District

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[chakes@valleywater.org](mailto:chakes@valleywater.org)

[www.valleywater.org](http://www.valleywater.org)



## ***Almaden Lake Improvement Project Description***

Almaden Lake is a 32-acre, manmade lake that is located within Almaden Lake Park, San Jose. The majority of the lake is part of a former quarry and the lake was initially formed by the breaching of the quarry levee located between the quarry pit and an adjacent creek. The adjacent creek was Alamitos Creek which now flows through the lake, which creates various water quality issues. The comingling of the lake and the creek occurred over time when the creek would overflow the quarry levee during times of high flow events.

Since the formation of the Lake, mercury-laden sediment originating from the historic mines located upstream has been depositing into the lake. Due to the lake's depth, combined with high nutrient and organic matter loadings from algal blooms and water birds, bottom waters and sediments in the lake frequently experience low oxygen or anoxic conditions. Under such conditions, certain microbes readily transform elemental mercury into methylmercury, a strong neurotoxin that readily accumulates in the tissues of organisms, that has bioaccumulated in fish.

In addition to the issues of methylmercury, elevated temperature, and low dissolved oxygen concentration, Almaden Lake also carries high concentrations of coliform bacteria and is subject to bluegreen algae blooms. These issues mostly result from the release of fecal matter from waterfowl, combined with lack of water circulation during low flow periods, warm temperatures, and nutrient loading, which together support algae blooms and continued presence of elevated bacteria levels. Due to poor water quality, public use of the lake has been impeded, and Almaden Lake has been closed to swimming since August 2010. Additionally, poor quality water released from the lake can impact and degrade water quality downstream along the Guadalupe River.

Migrating steelhead must pass through Almaden Lake to reach Alamitos Creek's upstream spawning habitat. Likewise, juvenile steelhead must pass through the lake during out-migration to the ocean. The comingling of Almaden Lake with Alamitos Creek imposes temperature and entrainment impacts to steelhead by disrupting its migratory passage through the footprint of the lake. Due to the unnaturally varied depths within the lake, and the lake's large surface area and long residence time, temperatures of the lake are elevated compared to the upstream Alamitos Creek source water. Elevated temperatures present less than ideal conditions to steelhead and other anadromous fish. In the summer months, the lake's elevated temperatures flow downstream into the Guadalupe River, The elevated temperature in the lake also supports non-native fish species that prey on steelhead. Entrainment of steelhead in the lake is also possible, making it difficult for steelhead and other anadromous fish to find the source stream at the upstream end of the lake.

The Project is proposed to address these issues by separating and restoring Alamitos Creek within the footprint of Almaden Lake.

The proposed improvements would:

- Separate Alamitos Creek from Almaden Lake using a levee;
- Re-contour the remaining lake bottom and cap it with clean fill;
- Stabilize an existing island and construct a new additional island for habitat; and,
- Establish vegetation along the banks of the restored Alamitos Creek channel, new lake edge and the islands.



Completion of the project would result in a reduced lake of approximately 17 acres in area and approximately 1,600 linear feet of restored creek channel totaling approximately 11 acres, providing the following benefits to water quality, beneficial uses, and wildlife habitat:

- Eleven (11) acres of restored Alamitos Creek designed to improve sediment transport and restore natural creek functions by developing a geomorphically stable channel.
- Improved passage for anadromous fish to restore and maintain healthy populations. The creek would be separated from the warmer waters and non-native fish in the lake. The restored channel would provide a clear path for anadromous fish to migrate through to the nine miles of Alamitos Creek upstream of the lake to Almaden Reservoir. The restored channel would also provide restored fish habitat.
- Improved water quality conditions in the remaining 17-acre lake. The Project would address the mercury-related water quality issues by capping existing elemental mercury in the separated lake area, while continuing effective source control measures to manage future methylmercury production. This improved water quality would benefit fish related and other recreational beneficial uses of the lake.
- Improved water quality conditions downstream. The project would reduce warmer water and mercury / methylmercury from discharging from the lake to the downstream waters of the Guadalupe River.

### ***Project Schedule***

#### *Planning 2011-2018*

- District staff is currently preparing the administrative draft EIR
- Release of the draft EIR is expected in December of 2017
- Preparation of Final EIR (Certification of the final EIR and project approval is expected in June or July of 2018)

#### *Environmental Permitting 2015-2019*

- The following permits are expected to be required for the project
  - USACE Section 404 permit
  - Take authorization, if needed, from NMFS and/or USFWS through Section 7 consultation
  - RWQCB Section 401 water quality certification
  - CDFW Section 1602 lake and streambed alteration agreement
  - New or modified water rights approval may be required depending on final project design
- Initial consultation with resource agencies began in February 2013 with a follow-up meeting in 2014. Next consultation will occur when draft EIR is released for public review.

#### *Design 2017-2019*

- project is currently in the preliminary design phase (30% design has been completed for the physical separation aspects of the project only. Staff is still conducting and coordinating preliminary design of the water supply aspects for the separate lake portion of the project.)
- design progression to 60% will not occur until after EIR certification.
- Assuming that EIR certification would occur in June/July 2018, 90% design is expected to be completed in early 2019

*Construction 2020-2021* (this estimated construction date is based on the assumption that the District would obtain all necessary permits and other approvals by end of 2019)