“N”

Additional Public Comment

Adventist Health
St. Helena

Dear Mr. Ringel,

We would like to send this letter in support of the Vida Valiente Winery project. We know our neighbors, the Drumwrights, will be good stewards of the land and we are happy to have another beautiful vineyard to act as a fire break on the street. We also appreciate the extra effort of putting water underground to allow for additional fire protection and overall aesthetic of the neighborhood. We hope the project will be approved.

The planned activities there are not going to be deleterious to any of the hospital operations and in general their presence only improves the local community. Thank you for consideration of this project.

Sincerely,

Steven Herber, MD

Steven Herber, MD

President

Adventist Health St Helena

10 Woodland Rd. | St. Helena, CA 94574 | 707.963.3611 | adventisthealth.org/st-helena

From: Carlo Mondavi
To: Ringel, Matthew
Subject: Vida Valiente | Show of Support | Hearing December 6th
Date: Wednesday, November 29, 2023 7:00:00 AM

[External Email - Use Caution]

Dear Matt,

I hope this finds you well.

I am sending you this letter of support for the Vida Valiente Winery project up for a hearing on December 6th.

Vida Valiente is a special project started by the Drumwright and Kaplan families. I am intimately familiar with the families, team, and project and know it will be an excellent addition to the valley. In addition to being incredible stewards of the land, this winery is tied to the Vida Valiente Foundation started by Susana and Hayes Drumwright. This foundation supports first generation low-income kids attending Stanford University with scholarships and mentoring. In just the first two years the Drumwrights are already supporting over 70 scholars. Vida Valiente's wine "The Movement" donates $100 from every single bottle sold to the Foundation to help fund and further grow this mission.

The Foundation is inspired by Susana's first-generation low-income background which normally makes higher education in institutions like Stanford nearly impossible to attain. Her mother is from Guatemala and her father from Mexico. Forbes covers Vida's purpose beautifully in two articles they have published about the winery and foundation. The first can be found here. Another terrific article on Vida Valiente from The Vintner Project featuring a few of the Vida Scholars can be found here. I hope you take a moment to read the articles and understand the positive impact Vida Valiente will have on our Napa community and beyond.

In addition to the Winery and the Foundation, the Drumwrights and Kaplans also invest in our local environment. They have worked directly with me helping to lead the charge gathering those in Napa and beyond to invest in a movement I founded called Monarch Tractor which is a technology helping reduce chemicals in agriculture and our carbon footprint in the valley. Named after the Monarch butterfly this technology aims to help reverse the damages that have led to the vast 99% collapse of the Monarchs along with many other invertebrates and birds. This year alone our tractors have touched over 25,000 acres of farmland and removed the equivalent of 3,000 cars worth of emissions. These important movements are not possible without people in our community like Hayes and Sam.

Needless to say, I know these hearings are influenced by the community and I wanted to share that I hope you, and your fellow members sway this to completion. Vita Valiente will be an incredible addition to our beautiful Napa Valley.

Thank you and I hope you share my support that Vida Valiente will be approved.

Sincerely,

Carlo

Links:

https://www.forbes.com/sites/cathyhuyghe/2022/06/20/the-kids-to-take-a-chance-on-wine-philanthropy-revisioned/?sh=76ecb5796a80

https://vintnerproject.com/wine/vida-valiente-and-wines-that-give-back/

Carlo R. Mondavi
co-founder | chief farming officer

Monarch Tractor

Monarch in CNET
Monarch in Bloomberg

RESERVE A MONARCH

George Caloyannidis
2202 Diamond Mountain Road
Calistoga, CA 94515

November 28, 2023

COMMENTS ON USE PERMIT #P20-00079
VIDA VALIENTE WINERY APPLICATION

RECENT HISTORY

The proposed project triggered several meetings and email exchanges within the Crystal Springs community beginning April 2020 and ending with a meeting attended by 33 of its members and the applicant on September 10, 2020 (APPENDIX 1).

Among the concerns, the foremost were:

C-1) The increased fire danger posed by a development which attracts hundreds of visitors and commercial activities in a fire prone area accessed by a road which does not meet minimum Napa County and State of California Standards.
C- 2) The substandard condition of the road amplifies the unsafe evacuation of fleeing residents with concurrent access by heavy fire fighting and EMS equipment.

Other concerns were:

C-3) The increased danger for residents using the road for walking, jogging or biking including their children.
C-4) Traffic impacts by heavy equipment during construction of the caves and structures and those of grape imports and wine exports.
C-5) The Projects cumulative impacts with the existing 4 wineries.
C-6) The industrial/entertainment facility character which imports ¾ of its fruit.
C-7) Insufficient on-site parking.
C-8) Neighboring wells being compromised by the new well and the increased water use.
C-9) Excessive noise during construction.

C-1) INCREASED FIRE DANGER

It is fateful that only 17 days following the September 10, 2020, community meeting, the devastating Glass Fire erupted at 4:00 am. This fire incinerated many homes along Crystal Springs Road Including the entire infrastructure of my own property at 470 Crystal Springs Road. Neither were the buildings on the applicant's property spared.

There are numerous studies around the world which show that approx. 84% of all fires are caused by human activity. Increasing such activity, especially in fire prone areas such as this, increases the likelihood of fire.

On July 15, 2020, the Deer Park Fire Safe Council submitted a letter to Napa County (APPENDIX 2) warning that this neighborhood *"is in both high and very high fire safety zone as determined by Cal Fire".*

Climate change studies and the devastating fires over the past years including in Napa County, make fire avoidance practices and safe evacuations mandatory considerations when granting any and all use permits.

C-2) ROAD STANDARDS

Napa County Road Standards specify a minimum paved road width of 20 feet plus 2 feet of shoulders.

Title 14 State Minimum Fire Safe Regulations, Article 2, Emergency Access and Egress (APPENDIX S) approved in April 2023, specifies (§1273.01) a *"minimum of 2, 10-foot traffic lanes not including shoulder and striping".*

They also apply* (§1270.02.b) *"to the future design and construction of Structures, subdivisions and Developments in the SRA".

Ingress and Egress to this project does not comply with either of the above.

Neither does it comply with (§1273.02 Road Surface / §1273.04 Radius / §1273.6 Turnouts).

Possible exemptions under (§1270.05. c) pertain to Defensible Space, not to Ingress and Egress Minimum Standards. An exemption for the sole accommodation of a winery does not qualify.

Neither Napa County nor state Codes mandate that all existing substandard roads be brought to conformity. But the standards, as specified above, must apply when considering access to new development.

C-2.1) MISINTERPRETATION OF ROAD STANDARDS

The applicant's CTG Final Traffic Impact Report (B.i.) states:

Crystal Springs Road now meets County rural road criteria to have a 20-foot pavement width in many locations between Silverado Trail and the Winery (to the north of the site). Widths range from 16 to 24 feet. Project promotional material, signing at the Silverado Trail / Crystal Springs Road intersection and signing for exiting vehicles would encourage project traffic to use this segment of Crystal Springs Road for access. South of the project site (to Sanitarium Road) the width of Crystal Springs Road ranges from 12 to 18 feet, the majority of the distance. A minor amount of project traffic would potentially travel on this section of Crystal Springs Road (2 vehicles per hour during business hours).

The above interpretation of standards-conformity of Crystal Springs Road is erroneous. Napa County and state Road Standards apply to the entire length of a road not just "*in many (of its) locations*". Access must be "unimpeded".

Even the northern end of the road which CTG argues will be the sole access to the winery operations as shown on its maps is non-conforming for approx. 400 feet at its steepest and most winding section, neither in width nor in its radius.
In addition, it is unrealistic to expect drivers to follow winery promotional material to access the winery as CTG maintains rather than follow internet directions. Since most visitors and employees access the winery from the south, they will use the shortest southern end of Crystal Springs Road. Therefore, equal consideration is due to the substandard condition of this section of the road. The Report fails to note that the road suffers from downslope erosion, from upslope boulders routinely falling on the road, that there are only 3 (and non-conforming) turnouts and that there are 11 severely skewed ascending and descending residential, mostly blind driveways.
The dramatic evacuation in the middle of the night as it happened at 4:00 am on September 27, pales in comparison if it had happened during events at one or more of the wineries.

C-2.2) MISSING ROSE LANE & CSR NORTH

Rose Lane and Crystal Springs Road North are both omitted in the CTG Report and its maps (APPENDIX 3). These two roads combined serve approx. 20 homes, vineyards and one winery. Rose Lane has an exceedingly steep access to CSR and is situated only a very short distance from the Sanitarium Road intersection. During an evacuation scenario, access to CSR would be blocked by just a few evacuating, lined up cars along CSR trying to negotiate the skewed, non-standard intersection at Sanitarium Road.
The homes, vineyards and winery on CSR North must be factored in the report because the CSR/CSR North intersection which the CTG Report designates as the winery's primary but unenforceable access and escape route must be considered in full operational capacity during such a scenario. Such function will be impaired by the escaping CSR North evacuees.

C-2.3) NON-REPRESENTATIVE EXISTING WINERY DATA

The CTG Report examined 3 wineries along CSR whose traffic counts were obtained during non-representative time frames:

1) Dakota Shy Winery, between January 31, 2020, and February 8, 2020. These are the lowest winery operation time frames in a year.
2) Wheeler Farms Winery, between October 18, 2020, and October 26, 2020.
3) Mattera Winery, between October 23, 2020, and October 31, 2020.

The latter two, mere weeks following the September 27 fires when access to the entire area was extremely limited and by special permit only. All data are selective and lack credibility.
Additionally, no data are provided for the Reverie Winery, which is important due to its impact on the CSR/CSR North intersection. I was unable to verify whether the Reverie Winery has approved visitation entitlements. Staff must research and verify.

C-2.4) EVACUATION CONFLICTS

The Deer Park Fire Safe County letter (APPENDIX 2) states:

The project *"presents problems for existing residents in terms of safe evacuation in case of fire or any rapid evacuation situations. Increased traffic on this road will only increase the danger to residents and visitors from an egress standpoint and will also potentially slow down first responders moving into the area."*
And *"We believe it is time the county, the Planning Commission, and the Board of Supervisors to look at development in our valley not just from the standpoint of a view, water and agriculture, but also from the increasingly ever-present danger of fire, its impact to our communities, and the ability for residents to safely evacuate if necessary".*
As both the Tubs/Atlas Peak and Glass Fires have shown, outbound evacuations are concurrent with inbound access of heavy firefighting equipment, thus, making adherence to road standards crucial and a mandatory disqualification when approving new projects accessed by substandard roads such as this.

C-2.5) RURAL CHARACTER INTERPRETATION

The CTG Report pg.19 states *"in some locations around the County, expanding physical transportation infrastructure could be in direct conflict with the County's goal of preserving the area's rural character, improving safety, and sustaining the agricultural industry, making these potential improvements infeasible".*
While preserving the county's rural character is a worthy goal, and while it may apply to many existing improvements served by substandard infrastructure, CTG is in error when it considers this as a license to approve new projects which are accessed by less than minimum road standards because bringing them up to standard would compromise their "rural character".
The accurate interpretation is the exact opposite: If we wish to preserve the rural character of a substandard road, we may not approve any development served by it and as mandated by Title 24 Regulations. Preserving rural character by increasing the danger of a community is a misinterpretation of the Code.

C-3) IMPACTS ON WALKERS / BIKERS

The CTG Report states (A.f.): *"No pedestrians are anticipated as there are no pedestrian paths along Crystal Springs Road or any other local roadway. No transit ridership by employees is anticipated as there is no service along Silverado Trail, Crystal Springs Road or Sanitarium Road. Class II bicycle lanes are provided along Silverado Trail and Deer Park Road (Silverado Trail to SR 29) and bicycle racks will be provided for all employees or guests biking to the site."*
It is presumptuous to assume that walkers with their dogs and joggers are not or will not use Crystal Springs Road because *"no pedestrian paths are provided".* (APPENDIX 4) is a limited compilation of the record provided by residents from May 3 to June 12, 2020, which shows that they routinely use the road for these activities including their children. The 6 featured reports identified a total of 16 adults, 6 children, 3 dogs and 3 biking children.
In addition, there is a school bus stop at the very intersection of Crystal Springs Road and its North Fork, which is the wishful main access to Vida Valiente.

C-4) TRAFFIC IMPACTS DURING CONSTRUCTION

The CTG Report bases its estimates on the basis of a completed and functioning Vida Valiente winery. **However, it completely ignores the impacts during its construction. These significantly increase fire danger, compromise evacuations during fires let alone the quality of life of residents**.

Since missing in the application, I developed a model on how the export of the 19,400 cubic yards of cut and fill and cave tailings may proceed. It results in a 1-year long optimal (but unrealistic) operation. It does not consider delays caused by seasonal weather conditions, neighboring winery operations and other unavoidable factors. The model is shown on (APPENDIX 5).
To this we need to add the construction timeline of the winery buildings, the sophisticated water storage and sewer disposal systems. Due to the extremely limited size of the construction area and the two soils storage areas, the simultaneous construction of the winery buildings, caves and soils export operation is unrealistic. They must be sequential.
If the construction of Chateau Boswell is any indication, we are looking at a minimum of 3-4 years of winery construction following the caves construction for a total of 5-6 years construction activities.
The impact due and during construction is so significant, that this entire process and timeline must be thoroughly examined before a use permit is granted.

C-4.1) TRAFFIC IMPACTS FROM GRAPE IMPORTS AND WINE EXPORTS

The CTG Traffic Report has not examined the impact of grape import trucking necessary to produce 23,856 gallons of wine.
Grape harvest occurs within a very narrow time window which means that the grape import traffic will be concentrated. On a standard road this would pose no problem but on the narrow section of the CSR northern end it is likely that bottlenecks of incoming and outgoing traffic will inevitably occur. One must also factor in the traffic impacts of the concurrent grape harvest import traffic generated by the other 4 area wineries including their visitors and events.
As also highlighted in **C-7**, no specific information has been provided as to the type of operation Vida Valiente will be. This will impact the frequency of wine exports from the winery.

C-4.2) IMPERRATIVE STRESS-TEST SCENARIO

As the safety of the banking system during its 2008 collapse was assessed and restored following a stress test, so must that of the Vida Valient winery.
This would involve assessing its operation in conjunction with those of the other area wineries. With all the pertinent data available in this our 21st century, a stress test by computer simulation can be easily developed. It is the only responsible way to provide comfort to the public and moral cover to the Planning Commission during a catastrophic event scenario.

C-5) CUMULATIVE IMPACTS

CEQA / XXI: MANDATORY FINDINGS OF SIGNIFICANCE (b) specify:
"Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects and the effects of probable future projects)?
The use permit data of the 4 wineries are shown in (APPENDIX 6). Their numbers are staggering.
Combined, these wineries are entitled to:
260,000 gallons of wine.
39,681 combined weekly and events annual visitors.
5 of these marketing events are for 100 or more people and are subject to shuttle service. (I was unable to find any visitation numbers for Reverie Winery).
The Vida Valiente 30,000-gallon winery production, with 7,115 combined weekly and annual event visitors - 2 of these events will also require shuttle service, most likely at the same time as others - must be weighed against these entitlements in full operation.
The above suggested Vida Valiente stress test must be evaluated against the concurrent traffic generated by either Wheeler Farms (70,000 gallons), or that of Mattera Winery (150,000 gallons) at full operation. Without these parameters being factored in, it is impossible to properly assess the impact of the Vida Valiente winery in general or during a catastrophic event.
Therefore, I take exception with the Initial Study Checklist (XXI. Mandatory Findings) that the winery's impact is "*less than significant*".

C-6) INDUSTRIAL PLANT / ENTERTAINMENT CENTER

We all recognize the importance of agriculture to the Napa Valley economy. While Napa County Code has many provisions protecting and promoting it, it does not specifically do so for wine or any other agricultural product.
It is highly unlikely that the Planning Commission would approve a tomato processing factory with a few on-site tomato plants which yield 6,144 pounds of tomatoes while importing 23,856 pounds from elsewhere and being entitled to producing a variety of tomato products, juices, sauces, jellies, concentrates etc. to be sold to and tasted along with tomato-based meals by visitors on Crystal Springs Road.
Accessibility problems aside, the overriding planning issue is whether the proposed winery - an industrial wine producing facility and entertainment venue - is appropriately situated within the "rural character" we wish to preserve or whether it belongs in the industrial zoned section of the county.

C-6.1) COMMERCIAL KITCHEN

In defiance to Napa County Code, County government has been turning a blind eye to wineries' commercial kitchens which prepare – even openly advertise - sumptuous meals by acclaimed

chefs. This has proven to be unfair competition to small restaurants around the valley and has forced them out of business. The demise of the once thriving small family restaurants in Calistoga is a testament to the blatant lack of enforcement by the County. No commercial kitchen or catered lunches and dinners should be permitted at this winery.

C-7) INSUFFICIENT ON-SITE PARKING

The Vida Valient application proposes 11 on-site parking spaces. The applicant has provided no information as to its type of operation. Is it a custom crush facility? Does it employ an outside bottling line? Is on-site farming performed in-house or by contracted farm labor? Is this a high price point winery? All these considerations have an impact not only on traffic but also on the number of parking spaces.

Crystal Springs residents who are in the wine business have provided proprietary data (not at liberty for me to disclose here but incumbent on staff to research) which identified a mere 4,000-gallon upscale winery having as many as 40 full-time employees for their one-on-one tastings.

Additional parking spaces will be required for 9-12 laborers (not all expected to ride together) for a mobile bottling line for 6-8 per year, (glass dumping, capsule installing, cases loading, case labeling, and pallet stacking). In addition to daily staff, sales reps, vendors and professional customers, cellar crew, forklift operators and service providers for the operation of any winery, will require more parking than is allocated.

The 28 daily visitors which the CTG Report (X.F) states "*will arrive in a staggering arrangement that there should never be more than 3-4 guest vehicles at site anytime*" assumes an unrealistic carpool sharing which in reality will require an additional 4-6 parking spaces.

Staff must obtain specific data on the type of operation this winery is going to be. At the very minimum, it seems realistic that 20 to 25 parking spaces will be needed. Otherwise, on-street parking will become unavoidable and will inevitably result in constant complaints by residents. Detailed analysis is needed.

C-8) NEW WELL AND WATER USE

To my knowledge, no professional study has been made to ascertain whether the additional well and the increased water use by the winery in full operation will not negatively impact the neighboring wells.

Regrettably, no notices were received by the immediate neighbors advising them of the new well permit.

C-9) EXCESSIVE NOISE DURING CONSTRUCTION

While the noise study finds noise generated by the operating winery complies with the Napa County's Noise Element, it has ignored noise generated by heavy equipment during the multi-year construction of the winery and its caves.

CONCLUSION

The individual comments under **C-1** through **C-9** speak for themselves. They outline the need for more data as to the operation of the Vida Valiente winery, the impacts during its construction, grape imports and wine exports, as well as for credible traffic data for the existing 4 wineries.

Crystal Springs Road is one of Napa County's rural roads enjoyed by residents and visitors for walking with their dogs, jogging and biking, including by children.

The road in its entirety is grossly substandard both by Napa County and state standards to accommodate the impacts of new development.

Past use permits for the existing wineries were granted ignoring the risks they posed in terms of fire danger and inadequate evacuation routes. It was a blessing that the 2020 Glass Fire began at 4:00 am when no winery activities were taking place. This was a narrow escape which prevented fatalities.

Had many of the grapes for the more than 260,000 permitted gallons been in any form of transit or processing, or even a fraction of the 39,681 annual permitted visitors been at the wineries, I would not wish to be one of the Planning Commissioners or Boards of Supervisors who approved such massive numbers at the time.

It is time to recognize the effects and dangers posed by the changing climate and to implement policies along Crystal Springs Road in its entirety which is substandard in its *Width, Turnouts, Radii, Road Surface* and the overall *Intent* of State Minimum Fire Safe Regulations.

The CEQA-mandated cumulative impacts of this project must be analyzed in all their components and weighed against the rural character of this community, the existing wineries in full operation, and foremost against those of ingress and egress during catastrophic fire events and the safety of residents, workers, employees and visitors.

The determination that this project's cumulative impacts are less than significant is a blanket statement not based on any analysis.

Both Napa Conty and state Codes have given our Planning Commission qualifying benchmarks/standards which ensure that communities are afforded a safe environment. It is incumbent upon them to implement them.

George Caloyannidis
2202 Diamond Mountain Road
Calistoga, CA 94515

December 1, 2023

SUPPLEMENTAL COMMENTS TO MY PRIOR DATED NOVEMBER 28, 2023
VIDA VALIENTE WINERY APPLICATION
USE PERMIT#P20-00079

It is quite surprising that the Staff Report in its approval recommendation does not even mention, let alone consider the devastating fire history of the area in which among other homes and structures, the applicants own structures were burned to the ground in September 2020.

Even more surprising is that the Staff Report fails to mention the NAPAFIREWISE letter dated July 15, 2020 addressed to the Planning Commission and the Board of Supervisors (and on file) which ominously advised both our government bodies of the imminent danger of further development in this area which CalFire designated as "both high and very high fire severity zones".

I attach the Memorandum from Plan Examiner Adam Mone, which enumerates the conditions of approval set forth by the Napa County Fire Marshal's Office.

Specifically, I draw your attention to Conditions # 1,4,5,7,9 and 12 which I have highlighted, and which specify:

#1. That the use of the facility shall comply with all applicable standards, regulations, codes, and ordinances.

#4. That all buildings, facilities, and developments be accessible to fire department apparatus by way of approved roads which comply with Napa County Road & Street Standards.

Note that this Memorandum is <u>dated 10/20/2021 which is prior to April 2023</u>, the date the State Minimum Fire Safe Regulations Title 24 were enacted into law.

#5 That all roads shall support apparatus weighing 75,000 lbs.

This also is a Title 24 Minimum Road Standard which many sections of Crystal Springs Road will not support if squeezed to the downslope side of the road by an escaping vehicle from the opposite direction.

#7. That Roadways shall be a minimum of 20 feet in width with a 2 foot shoulder and 15 foot vertical clearance.

This is also a Title 24 Minimum Standard which the overwhelming length of Crystal Springs Road does not comply with, and which applies both to new road construction and to the design of new development (§ 1270.02 – 7) which the Napa County Road & Street Standards do not specifically do.

#9 That all Turnouts be a minimum of 12 feet width, 30 feet in length and 25 foot taper on each end.

This is also a Title 24 Minimum Road Standard does not. There is only one standard-complying turnout along the entire length of the road, which is otherwise deficient in any, not even non-complying turnout.

#12. Roadway radius shall not have an inside radius of less than 50 feet**.** And additional surface width of 4 feet shall be added to curves of 50-100 feet radius and 2 feet to curves of 110-200 feet radius.

The curved intersection of Crystal Springs Road with Crystal Springs Road North does not comply with this Title 24 Minimum Road Standard. Note that this curve is designated by the applicant as the only access route to the winery and all of its construction and caves export heavy equipment.
The same non-standard condition applies to the intersection of Crystal Springs Road with Sanitarium Road.

CONCLUSION:

The above enumerated conditions by the Napa County Fire Marshal's Office are conditions the applicant is unable to meet unless Crystal Springs Road is brough up to Napa County Road Standards.

In April 2023, the State of California stepped in to further ensure the safety of residents, workers, employees and visitors in the fire prone zones by enacting the Minimum Fire Safe Regulations Title 24. They echo and further amplify those of Napa County.

Since the Fire Marshal's Office Conditions of Approval predate the Title 24 conditions, it is now incumbent upon this Office to include them in its own conditions of approval and it is incumbent upon the Planning Commission to impose them.

Napa County Fire Department
Fire Marshal's Office
Hall of Justice, 2nd Floor
1125 3rd Street
Napa, CA 94559

Office: (707) 299-1466

Adam Mone
Fire Plans Examiner

A Tradition of Stewardship
A Commitment to Service

MEMORANDUM

TO: Planning	DATE: 10/20/21
FROM: Adam Mone, Plans Examiner	
SUBJECT: **P20-00079 Visa Valiente Winery**	**021-410-013-000**

The Napa County Fire Marshal's Office has reviewed the submittal package for the above proposed project. The Fire Marshal approves the project as submitted with the following conditions of approval:

1. All construction and use of the facility shall comply with all applicable standards, regulations, codes and ordinances at time of Building Permit issuance.
2. Beneficial occupancy will not be granted until all fire department fire and life safety items have been installed, tested and finaled.
3. Separate submittals required for Underground Fire Lines, Fire Pump, Automatic Fire Sprinklers, Fire Alarm Systems, Kitchen Hood Extinguishing Systems, High Piled Storage (any combustible stored over 12 feet in height) and Emergency Responder Radio Coverage systems.
4. All buildings, facilities, and developments shall be accessible to fire department apparatus by way of approved access roadways and/or driveways. The fire access road shall comply with the requirements of the Napa County Road & Street Standards.
5. Access roads shall be designed and maintained to support the imposed loads of fire apparatus and shall be surfaced so as to provide all-weather driving capabilities. Provide an engineered analysis of the proposed roadway noting its ability to support apparatus weighing 75,000 lbs.
6. Provide fire department access roads to within 150 feet of any exterior portion of the buildings as measured by an approved route around the exterior of the building or facility.
7. Roadways shall be a minimum of 20 feet in width with a 2 foot shoulder and 15 foot vertical clearance.

Napa County Fire Department
Fire Marshal's Office
Hall of Justice, 2nd Floor
1125 3rd Street
Napa, CA 94559

Office: (707) 299-1466

Adam Mone
Fire Plans Examiner

A Tradition of Stewardship
A Commitment to Service

MEMORANDUM

8. Driveways shall be a minimum of 10 feet in width with a 4 foot shoulder and 15 foot vertical clearance.
9. Turnouts shall be a minimum of 12 feet in width, 30 foot in length and 25 foot taper on each end.
10. Turnarounds are required on driveways and dead end roadways.
11. Grades for all roadways and driveways shall not exceed 16 percent.
12. Roadway radius shall not have an inside radius of less than 50 feet. And additional surface width of 4 feet shall be added to curves of 50-100 feet radius and 2 feet to curves of 100-200 feet radius.
13. Gates for driveways and/or roadways shall comply with the California Fire Code, section 503.5 and the Napa County Road & Street Standards and CA Fire Safe Regulations for projects within SRA.
14. Commercial - Water storage (for buildings not served by a public water system) and fire flow calculations shall be provided by a Certified State Licensed Civil Engineer, C-16 licensed contractor, or registered engineer indicating compliance with California Fire Code Appendix B and the Napa County Municipal Code.
15. Commercial - Approved steamer hydrants shall be installed within 250 feet of any exterior portion of the building as measured along vehicular access roads. Private fire service mains shall be installed, tested and maintained per NFPA 24.
16. Commercial - Fire Department Connections (FDC) for automatic sprinkler systems shall be located fully visible and recognizable from the street or fire apparatus access roads. FDC shall be located within 50 feet of an approved fire hydrant.
17. Commercial - The minimum main size of all fire hydrants shall be 6 inches in diameter. Piping shall be installed with C-900 class 200 piping or ductile iron or equivalent per NFPA 24 for the installation of Underground Fire Protection Mains
18. An automatic fire sprinkler system shall be installed in accordance with provisions set forth in the California Fire Code as amended by the County of Napa and the applicable National Fire Protection Association Standard. Automatic fire sprinkler systems shall be designed by a fire protection engineer or C-16 licensed contractor.

Napa County Fire Department
Fire Marshal's Office
Hall of Justice, 2nd Floor
1125 3rd Street
Napa, CA 94559

Office: (707) 299-1466

Adam Mone
Fire Plans Examiner

A Tradition of Stewardship
A Commitment to Service

MEMORANDUM

19. All buildings shall comply with California Fire Code, Chapter 10 Means of Egress requirements. Including but not limited to; exit signs, exit doors, exit hardware and exit illumination.

20. Provide 100 feet of defensible space around all structures.

21. Provide 10 feet of defensible space fire hazard reduction on both sides of all roadways of the facility.

22. Emergency responder radio coverage **in** new buildings. All new buildings shall have approved radio coverage for emergency responders within the building based upon the existing coverage levels of the public safety communication systems of the jurisdiction at the exterior of the building.

Please note that the comments noted above are based on a Fire Marshal review only. There may be additional comments or information requested from other County Departments or Divisions reviewing this application submittal package. Napa County Fire Marshal's Office Development Guidelines can be found @ www.countyofnapa.org/firemarshal. Should you have any questions of me, contact me at (707)299-1466 or email at adam.mone@countyofnapa.org

From: drmarcomartin
To: Ringel, Matthew
Subject: Use Permit #P20-00079
Date: Friday, December 1, 2023 2:02:52 PM

[External Email - Use Caution]

Dear Mr. Ringel,

I am writing to get my opposition to Use Permit #P20-00079 (Vida Valiente) on record. My family and I are opposed to this project for the reasons stated by others, including, but not limited to size, traffic, water, noise. Particularly we are very concerned about the safety of our little children.

Best regards,

Marco Martin and family
595 Crystal Springs

Richard Martin MD, MPH
603 Crystal Springs Rd.
St. Helena, CA 94574

COMMENTS ON USE PERMIT #P20-00079
VIDA VALENTE WINERY APPLICATION

Fallacies and inadequacies in the Vida Valiente Winery Final Traffic Impact Report should be pointed out.

Fallacious Statement:
"PEDESTRIAN, BICYCLE AND TRANSIT IMPACTS
Less than significant - No pedestrians are anticipated as there are no pedestrian paths along Crystal Springs Road or any other local roadway. No transit ridership by employees is anticipated as there is no service along Silverado Trail, Crystal Springs Road or Sanitarium Road. Class II bicycle lanes are provided along Silverado Trail and Deer Park Road (Silverado Trail to SR 29) and bicycle racks will be provided for all employees or guests biking to the site."

Comments:

Pedestrians:
As a 34-year occupant of Crystal Springs Road I can attest to fallacies in the transit impact statements. Crystal Springs Road is a local favorite road for recreational walking. My wife and I walk much of the length of Crystal Springs Road near daily and are very familiar with the foot traffic on our narrow rural road.
Daily there are a minimum of 8 regulars who walk near the full length of the road which includes walking past the proposed Vida Valiente Winery. Frequently there are additional groups with a total of 20 or more individuals utilizing the road during the day for recreational walking. Often accompanying walking families are children on bicycles. Dog walking is also very popular on the road which adds another complication to the narrow widths. The beauty of this rural road and limited traffic is also a draw to individuals who drive and park in a turnout near the southern end and then walk the length of the road. The turnout location allows them to avoid driving past the narrow section(s) of the road.

The conclusion that signage and literature is going to direct a significant portion of traffic to the North side of Crystal Springs is another fallacy. Most individuals will be coming from the south and utilizing Phone Mapping Programs which will direct them to the southern entrance of Crystal Springs Road. Most individuals traveling back south will following their Phone Mapping Programs regardless of a sign pointing north to Silverado Trail. To believe otherwise is to

disregard that most individual's current behaviors regarding the near ubiquitous use of mapping programs.
There is a telling yet somewhat obscure statement on page 26 of the Traffic Impact report: "While it is the desire that all project traffic use Crystal Springs Road north of the project for all in- and outbound access, the reality is that those drivers depending upon navigation systems may be directed to use Crystal Springs Road south of the site if they are traveling to or from the south."

Bicycle Usage:
Crystal Springs Road is a favorite cut off road for bicyclists wishing to avoid the traffic on Silverado Trail. Everyday individuals or groups of cyclists use to road for recreational cycling. On the day of this letter a group of 8 riders in additional to a couple of individuals riders were seen with just 30 minutes of being outside where the road can be visualized. Many of the bike tours have used Crystal Springs as part of their planned tour ride.

Inadequate Conclusions:
CRYSTAL SPRINGS ROAD
"Informational purposes only - Crystal Springs Road now meets County rural road criteria to have a 20-foot pavement width in many locations between Silverado Trail and the Winery (to the north of the site). Widths range from 16 to 24 feet….
South of the project site (to
Sanitarium Road) the width of Crystal Springs Road ranges from 12 to 18 feet the majority of the distance. A minor amount of project traffic would potentially travel on this section of Crystal Springs Road (2 vehicles per hour during business hours)."

Comments:

What does the sentence mean where it states that Crystal Springs Road now meets County rural road criteria to have 20-foot pavement with yet it than states this is not true for portions of the road? Either the road meets County rural road criteria, or it doesn't. One should not state that sections are wide and even though there are narrow sections we should look only at the wide sections. It should really be the opposite. The narrow sections of only 12 ft. with drop offs on both sides (one is 12 inches into a culvert and the other side is down an embankment of several feet are far more important than the wide sections). It seems irresponsible to gloss over these narrow impassible sections while implying there are wider sections so ignore the narrow sections. How is this different from stating: There are 2 railroad tracks at many areas so don't worry about the areas of single track. Just let the trains travel as they wish. **As a medical professional I consider the plans as written to be an unnecessary public health hazard.**

Conclusions and Local Recommendations:

Allowing for 28 daily visitation guests in addition to the employees will negatively impact the safety and rural nature of Crystal Springs Road. The study's conclusion that winery trip generation is estimated to be 14,648 per year (Page 35) which averages 40 trips every day. This would at least double the current traffic on this substandard rural road. One would anticipate that this would motivate the planning commission to pause and reconsider approval of the wineries scope and visitation plans. I would suggest that each planning commissioner visit Crystal Springs Road and stop to evaluate the narrow sections. As noted before, one narrow section has drop off on each side (south end), the other narrow section is on a step incline with a blind turn on the left side. Attached are pictures of a couple of the narrow sections that demonstrate the narrow nature of road sections. The individual's wingspan is 6 ft.

Thank you for your consideration,

Richard Martin

South end with drop offs on both sides.

North end on a significant slope and sharp sweeping turn toward Silverado Trail.

Comments on Vida Valiente Winery Use Permit

P20-00079

407 Crystal Springs Road, St. Helena, CA 94574

APN 021-410-013-000 and 021-372-001-000

Submitted by Larry Vermeulen

670 Crystal Springs Road, St. Helena, CA 94574

First off, let me say that the applicants hosted a neighborhood meeting at their property in the summer of 2020. At that time, I suggested that there would likely be little resistance to an estate-grown-only winery. Their response was, "that doesn't work for us."

So instead of being sensitive to the concerns of the neighbors, Applicants have proposed a winery that is 50% - 55% larger by gallons of production and 193% - 207% larger by square footage than the other 2 wineries in the area. They want to import 80% of their fruit, invite 7246 guests per year to visit, and generate 14,648 new vehicle trips annually on a substandard country road.

It should then come as no surprise that there is neighborhood opposition to the project as proposed. This is no longer a family winery proposal; it is an industrial processing facility/ entertainment venue. My opposition to the project, as proposed, follows.

1. The proposed project is simply too large and inappropriate for the rural neighborhood, serviced by a substandard country road:
   - The Staff Report/Board Agenda Letter, Page 6, lists 6 wineries within 0.3 miles of the proposed project. Of these, 4 are irrelevant as they have access from the Silverado Trail, a major thoroughfare with left-turn lanes, center and side striping, reflectors, illuminated intersections, dedicated bike trail, and guard rails as needed.
   - The remaining two, Merus Wines and Woodbridge Winery, have access from Crystal Springs Road, a narrow, substandard country road with no center line, no reflectors, no shoulder in many areas, no illumination, and no guard rails on the hilly sections.
   - Their permitted production, in gallons, is 20,000 for Merus, and 19,000 for Woodbridge, per the County of Napa Winery Database Listing.
   - The proposed capacity for Vida Valiente is 30,000; 50%- 55% larger than the other wineries in the neighborhood.
   - The Winery Use Permit Application and Project Statement, submitted by the applicants, Page 4, shows a total of 33,797 square feet of Total Usable Area.
   - By comparison, the County of Napa Winery Database Listing shows Total Size for Merus and Woodbridge at 11,527 square feet and 10,985 square feet, respectively.
   - Thus, Vida Valiente's proposed building area is 193% - 207% larger than the other wineries in the neighborhood.
   - The Staff Report/Board Agenda Letter, Page 18, states that the project will add, "approximately 61,100 square feet of winery development area. "Winery development Area" is not defined but all other measurement of building size pale by comparison this one.

- The Winery Use Permit Application and Project Statement states that "Winery Development Area" will be 21,150 square feet, but that "Winery Coverage" will be 67,700 square feet.
- A Use Permit decision cannot be made on the basis of undefined terms and inconsistent measurements.
- Woodbridge Winery has no tours or tasting, and Merus Wines is allowed 25 guests per day, slightly less than the 28 proposed for Vida Valiente.
- Neither Woodbridge nor Merus have commercial kitchens.
- Perhaps most telling is this screenshot from Winery Comparison Analysis that shows that Vida Valiente's proposed physical size far exceeds the average for all other 30,000-gallon wineries in Napa County, as do their Daily Visitors, Annual Marketing Visitors, and Number of Marketing Events. Their Weekly Visitors, and Annual Visitors, and Annual Visitation are above the Median for like-sized wineries as well.

Vida Valiente Winery
Use Permit #P20-00079
Winery Comparison 30,000 gallons per year

Name	Bldg Size	Cave Size	Production	Daily Visitors	Weekly Visitors	Annual Visitors	Annual Marketing Visitors	Number of Marketing Events	Annual Visitation	Acres
AVERAGE CALCULATION	9,541	3,755	30,000	21	137	7,270	742	20	7,998	33.23
MEDIAN CALCULATION	8,522	0	30,000	16	105	5,546	500	12	**6,338**	**22.64**
VIDA VALIENTE WINERY	**17,722**	**13,675**	**30,000**	**28**	**120**	**6,240**	**1,006**	**29**	**7,246**	**16.93**

2. The Recommended Conditions of Approval, prepared by Napa County Planning Department, is inconsistent as it pertains to the number of Large Auction Events permitted:
   - Recommended Conditions of Approval states that two Large Auction events per year with up to 125 guests are allowed. This is the number of Large Events you are being asked to approve today. However…
   - Page 5 of the Winery Use Permit Application and Project Statement states that One "Larger Auction-Related Event" is requested, with a maximum of 125 guests.
   - The Memorandum on the Conditions of Approval from the Department of Public Works, dated October 29, 2021, lists a Condition of Approval as "One (marketing event) per year with up to 125 guests.
   - The Memorandum on the Conditions of Approval also lists the total number of marketing events per year as 28 (consistent with one large auction event, not two).
   - The Final Traffic Impact Report, Vida Valiente Winery, states on Page 8 that, "Three sizes of marketing events are proposed… 1 per year with 125 guests."

3. The Recommended Conditions of Approval, prepared by Napa County Planning Department, is unclear as to the permitting of "Large Auction Events":
   - Item 2, above, points out the inconsistency in the documents as to whether 1 or 2 Large Auction Events will be permitted. This is further complicated by the following:
   - Page 6 of Recommended Conditions of Approval states that, "Auction Napa Valley (ANV) events need not be included in a participating winery's marketing plan because they are covered by the ANV's Category 5 Temporary Permit. The winery may utilize any ANV event authorized in this permit for another charitable event of similar size."

- Does this mean that in addition to the approved Large Auction Events, additional events may be conducted under the ANV Category 5 Temporary Permit? If not, then why is this language included or, conversely, why are the Large Auction Events listed as permitted if, per the paragraph above, they do not need to be. Exactly how many Large events can be held and under what permits?
- Do Events held under ANV's Category 5 Temporary Permit need to comply with all other conditions of the Project's Use Permit, or is it a free-for-all? Shouldn't ANV's Category 5 Temporary Permit be included as part of this application?

4. The Recommended Conditions of Approval, prepared by Napa County Planning Department, is inconsistent as it pertains to the hours of operation:
    - The Recommended Conditions of Approval defines on Page 2, Marketing events, which include 24 Wine and Food Pairings for up to 24 guests, 3 Wine Release/Wine Club Events annually for up to 60 guests, and 2 Large Auction Events annually for up to 125 guests. It also states that Marketing Events will be conducted between the hours of 6:00 PM to 10:00 PM.
    - However, Page 4 of that document shows the hours of operation for those same Marketing events as 11:00 AM to 10:00 PM.
    - Curiously, the Winery Use Permit Application and Project Statement doesn't address the hours of its Marketing Events at all.

5. The Recommended Conditions of Approval, prepared by Napa County Planning Department, is inconsistent as it pertains to food preparation at the Winery:
    - The Winery Use Permit Application and Project Statement describes their "Food Service" as follows:
        - On-site commercial kitchen for smaller events
        - Licensed caterers for larger events, with winery kitchen used as staging area for caterers.
        - Request permission to serve light fare food with approximately one-third of the private tours/tastings. This food will be prepared by the on-site commercial kitchen, which is requested as a "medium-risk" kitchen.
        - The light fare to serve with wine tastings will range from cheese and cracker plates, to a series of light or heavy hors d'oeuvres, all of which are paired with the wines made at the winery.
        - The on-site kitchen will be adequate to prepare simple luncheons and dinners, or as use as a catering staging are for the times that licensed caterer provide food. The luncheons or dinners with up to 24 persons attending can be serviced by the winery kitchen.
        - Larger events of over 24 persons, will have food prepared by licensed caterers. Thay may use the on-site kitchen as a caterers' staging area.
        - All food served at the winery will be chosen to pair with the wines made on-site. No food other than that served in connection with the wine pairings will be offered at the winery or prepared at the on-site commercial kitchen.

- The Recommended Conditions of Approval states that "Marketing Events" which include "Two (2) Wine and Food Pairings monthly for up to 24 guests," will be conducted between the hours of 6:00PM and 10:00PM.
- This begs the question of where, "The *luncheons*… with up to 24 persons attending," fit into the allowable hours of operation for Marketing Events?
- What's a "medium-risk" kitchen?
- Again, a Use Permit decision cannot be made on the basis of inconsistent data and undefined terms.

6. The Recommended Conditions of Approval, prepared by Napa County Planning Department, is inconsistent as it pertains to parking on Crystal Springs Road:
    - Page 7 of Recommended Conditions of Approval states that Parking "shall not occur along access or public roads *except* during harvest activities and approved marketing events." This is at odds with all other statements regarding parking within the public right-of-way as follows:
    - Page 4 of Recommended Conditions of Approval states that "If any event is held which will exceed the available on-site parking, the permittee shall prepare an event-specific parking plan which may include, but not be limited to, valet service or off-site parking and shuttle service to the winery."
    - Page 3 of Staff Report/Board Agenda Letter states that, "For larger events, vineyard rows can accommodate a number of valet-parked cars."
    - Page 2 of Memorandum on the Conditions of Approval from the Department of Public Works states that, "Parking within the public right-of-way is prohibited during visitation, large marketing, and/or temporary events."
    - This sentence has just introduced a new event type, "temporary events," which is not defined anywhere else in the application.
    - The Vida Valiente Winery Transportation Demand Management (TDM) Program, from the Appendix of the Final Traffic Impact Report, Item 13, states, "There will be no parking within the public right-of-way that is associated with any of the Winery hospitality evets, including larger marketing events."
    - Unfortunately, no mention is made of construction parking. This will be discussed below.

7. The Final Traffic Impact Report, Vida Valiente Winery, is flawed, outdated, and does not address construction traffic at all:
    - Traffic counts were performed in early 2021 when tourism and general mobility were still at reduced levels due to COVID fears.
    - Daily Trips analysis is based upon original application for just 1 Large Marketing Event, not 2 as currently included in the Recommended Conditions of Approval, prepared by Napa County Planning Department.
    - No analysis whatsoever was provided for construction traffic or parking.
    - The Final Traffic Impact Report, Vida Valiente Winery states, "Crystal Springs Road ranges in width from about 16 to 24 feet north of the Winery, and from about 12 to 18 feet south of the Winery." Other documents repeat this sentence and I do not take exception to it.

- The Final Traffic Impact Report states "Signs are posted on Crystal Springs Road just north of Sanitarium Road and east of Silverado Trail stating, 'Narrow Winding Road Next 2 miles' with 25 mile-per-hour speed limit signs." They also mention that "a few vehicles were observed traveling higher than the posted speed limit during two field surveys." This is hardly a comprehensive analysis of the traffic patterns on the road.
- My own observation as a 35-year resident of Crystal Springs Road is that. on the straight stretches of road, as adjacent to the applicant's property, speeds can reach 50 MPH.
- Speeding has become more prevalent since the Glass Fire as tree removal has reduced the shade on the road and increased sight lines.
- Crystal Springs Road is commonly used as a shortcut for drivers coming down from Angwin and heading north on the Silverado Trail. Likewise, there is regular traffic from St. Helena Hospital employees getting off work in the afternoon and heading north. These folks are typically not out for a drive in the country. They are getting off work and wanting to get home. I hear them accelerating through the narrows below my house and I can observe them speeding northbound as far as the 400 block of Crystal Springs Road.
- The Final Traffic Impact Report indicates that "The road has no centerline and intermittent gravel, or dirt shoulder areas." What is lacking from this brief description is that the road also has no side striping, no pavement reflectors, very limited roadside reflectors, no bike lanes, no guardrails, and no nighttime illumination except at its intersection with Silverado Trail and Sanitarium Road. In other words, it is a typical substandard rural country road.
- In spite of this, it is rated Level of Service (LOS) A. This is a bit misleading as LOS only measures traffic throughput, not the safety of the road. As long as traffic is not delayed, the road or intersection is rated favorably.
- The Final Traffic Impact Report states on Page 2 and again on Page 6, "Crystal Springs Road now meets County rural road criteria to have a 20-foot pavement width in many locations between Silverado Trail and the Winery (to the north of the site)."
- Napa County Roads & Street Standards (2023) does not use the term and has no definition for "rural road." Crystal Springs Road would properly be classified as a "General Minor" road. As such, the width standard is, "a minimum of two ten (10) foot traffic lanes, of homogenous surface, and a minimum of one (1) foot of shoulder on each side of the roadway…"
- Per the Final Traffic Impact Report, Figure 7, and numerous written descriptions, Crystal Springs Road north of the proposed project does not have 20 feet of traffic lanes and has little-to-no shoulder. Averaging the 500' interval measurements taken for Figure 7 yields only 17.4 feet in width.
- Furthermore, the County of Napa Pavement Management Program PCI Map Book, Map 54, shows Crystal Springs Road as "Poor" (equivalent to a grade of "D").
- Suggesting that this section of road meets "County rural road criteria," is a blatant misrepresentation of the facts.
- The Final Traffic Impact Report states on Page 30, "In general Crystal Springs Road would not be attractive to bicycle riders due to its width, but may be attractive due to its low volumes."

- In fact, bicyclists use the road extensively. It is very common to see groups of 10 or more cyclists on the weekends and many organized tours and races in the Napa Valley use Crystal Springs Road as a leg of their route.
- In addition, cyclists from the Rose Lane, Elmshaven, and Glass Mountain neighborhoods as well as from St. Helena are regular riders on the road.
- Likewise, Crystal Springs Road is very popular with walkers and joggers from Rose Lane, Elmshaven, and Glass Mountain neighborhoods, as well as residents of St. Helena. I often see people from St. Helena parking their cars in the pullout near my property as they head out for a walk or run.
- The Final Traffic Impact Report states on Page 31, "the (yearly) Winery trip generation would be 14,648." It also states the project's impact on pedestrians and bicyclists would be "Less than significant." It's hard to conclude that an average of an additional 40 vehicle trips per day would have no impact on the pedestrians and bicyclists who use the road.
- The road is also popular with motorcycle clubs and car clubs who often add it to their itinerary to enjoy the rural scenery without having to contend with the high-speed traffic on the Silverado Trail.
- The Final Traffic Impact Report also fails to address the problem of intoxicated drivers. It's a pretty good bet that when you have night time Marketing Events that include catered meals each guest will consume multiple glasses of wine. It's highly likely that a large percentage of them will be over the legal blood/alcohol limit at the end of the event. Now those folks are going to get in their cars and attempt to negotiate the unlit, substandard Crystal Springs Road and find their way back to their homes or hotels. Even if they have been transported by limo busses from outlying parking areas, they will, at some point, get back onto our local roads and present a danger,

8. Potential for disaster at the narrowest point of Crystal Springs Road
    - At the narrowest portion of the road, adjacent to my property at 670 Crystal Springs Road, the width is indeed just 12 feet wide. To further complicate matters, on the downslope (southbound) side of the road there is only an asphalt curb to prevent one from driving off the edge of a sheer slope into my neighbor's home below. There is no guardrail here. The slope of the embankment is 60 to 90 degrees. There are visible areas of erosion and undermining of the (minimal) shoulder on which the curb has been applied. Much of that edge of the roadway is supported by natural soils or dry-stacked stones. There are some limited sections of mortared stones, but nothing on that slope qualifies as an engineered retaining wall.
    - On the upslope (southbound) side of the road there is an open trench of 8 – 12 inches depth, filled with water year-round. There are a number of springs along this section of road, some mentioned in deeds from over 100 years ago. There is a system of culvert pipes and drain boxes installed to convey this spring water under the road to the downslope side and via small creeks, into Bell Creek. The standing water is the result of a broken culvert pipe that would otherwise convey the water from one drain box to another. I have informed the County Department of Public Roads of this condition many times over the past 20 years, but it remains unrepaired. Meanwhile, the northbound pavement edge chips off a little bit every time somebody drops a wheel into the trench, and the road keeps getting narrower. But I digress.

- To further add to the danger in this section, the water from the broken culvert pipe has been saturating the road base for many years and there are areas in the southbound lane where the pavement has slumped 2 inches or more.
- Two approaching vehicles any larger than a typical passenger car must slow to about 5 MPH as they negotiate passing one another without either hitting the curb on the southbound side or dropping their wheel into the trench on the northbound side. The scraping sounds I hear from my yard and the scrape marks on the pavement tell me that they are not always successful, as do the shards of plastic and glass I find on the road where their mirrors have collided.
- Any vehicles larger than passenger size must somehow communicate with one another for one of them to hang back from the narrow section. This often involves somebody backing up.
- It gets particularly challenging when a large truck travels through this narrow section. They usually cannot back up so the other vehicle must give way.
- To add to the complexity of the situation, buried utilities in this area of Crystal Springs Road include the City of St. Helena's primary water main, PG&E's high-pressure gas transmission line feeding the St. Helena Hospital, PUC, and all natural gas customers in the area, PG&E's low-pressure gas supply lines to residents along Crystal Springs Road, St. Helena Hospital's 4" water main, and St. Helena Hospital's 5" sewer main, conveying wastewater from the Hospital and surrounding customers to their sewage treatment ponds on Glass Mountain Road near the Silverado Trail.
- The worst possible outcome at this narrow section would be a heavily-loaded southbound truck pulling far to the edge of the roadway and the roadway giving away. Not only would the road be out of service for a period of time and the County subject to expensive emergency repairs, but damage to the buried utilities could also have repercussions as serious as disrupting the City of St. Helena's water supply, or damage to PG&E's gas lines.

9. The Proposed Traffic Mitigation Measure (TRANS-1) is insufficient, unenforceable, and does not address construction traffic at all.
    - All parties agree that the southern portion of Crystal Springs Road, from the project to Sanitarium Road, is extremely substandard and not suitable for Winery traffic. The Applicant proposes to address this issue by the adoption of Proposed Traffic Mitigation Measure (TRANS-1) which reads as follows:

        MM TRANS-1: All promotional information and driving instructions provided to guests will only show the Crystal Springs Road connections to Silverado Trail north of the site as the project access route. Also, a sign with the Winery's name will be provided on Silverado Trail at the Crystal Springs Road intersection. Finally, signs will be provided along both Winery Driveways for outbound drivers with an arrow pointing north and a message indicating to make a left turn to access Silverado Trail. Sign size and location are subject to NCC Section 18.116.055 and 18.116.060. A directional sign shall not be constructed, or promotional material distributed, that guides individuals to enter the winery from Deer Park Road or Sanitarium Road.

        Method of Monitoring: Prior to issuance of building permits for any winery structure, a sign plan shall be submitted to the Department of Planning, Building,

and Environmental Services for review and approval. Prior to obtaining final occupancy for any winery related structures, directional signs shall be installed and copies of promotional information with driving directions shall be submitted to the Department of Planning, Building, and Environmental Services for review and approval.

Responsible Agency: Napa County Planning Division and Code Enforcement

- One obvious problem with this mitigation measure is that "Method of Monitoring" pertains only to the production of the signs and promotional information. Monitoring essentially ends once those tasks are complete, there is no monitoring to confirm that the intent of the mitigation measure is actually being fulfilled.
- Additionally, the mitigation measure is unenforceable as noted by the Final Traffic Impact Report that states on Page 2 and Page 6, "A minor amount of project traffic would potentially travel on this (southern) section of Crystal Springs Road (2 vehicles per hour during business hours)."
- The Final Traffic Impact Report also states on Page 22, "While it is the desire that all project traffic use Crystal Springs Road north of the project for all in- and outbound access, the reality is that those drivers depending upon navigation systems may be directed to use Crystal Springs Road south of the site if they are traveling to or from the south."
- The mitigation measure is only targeted toward "guests". There is no provision for reaching employees, vendors, suppliers, and most importantly, tour bus and limousine operators.
- The most glaring omission is that TRANS-1 does not address construction traffic or parking. Given the nature of the project, and the fact that, "removal of cave spoils will result in total of approximately 2,425 truck trips if smaller trucks are used; a total of approximately 1,617 truck trips will be required if larger trucks are used for haul," the traffic impact during construction will be significant and, as previously discussed, heavy trucks are exactly the kind of traffic that needs to be restricted from using the southern section of Crystal Springs Road.
- Likewise, in spite of restrictions against parking on the Public Right of Way by employees, guests, caterers, etc., no mention is made of construction vehicles whatsoever.
- The conditions of TRANS-1 must be applied to ALL vehicles and must be enforced. It may be necessary to have a paid traffic monitor during construction to ensure that construction vehicles do not use the southern section of Crystal Springs Road.

In conclusion, I believe that I have amply enumerated a sufficient number of significant inconsistencies and unclear situations such that you cannot proceed with a fact-based analysis of this project at this time. Further, I have demonstrated that the Proposed Project is far larger and out-of-scale with the other wineries in the neighborhood, and the neighborhood itself. And finally, it is obvious to all, including the Applicant, that Crystal Springs Road cannot adequately support the additional traffic from this project. Applicant has attempted to address this problem with a Mitigation Measure that is insufficient and unenforceable.

Therefore, I implore you to exercise Option 4 of the Decision Making Options of the Staff Report/Board Agenda Letter – Continuance Option, with the following instructions.

1. Direct Applicant to amend Use Permit Application to reduce annual gallons of production from 30,000 to 20,000 gallons to be consistent with the other wineries in the neighborhood.
2. Direct Applicant to amend Use Permit Application to adhere to the One Large Auction Event as originally submitted with no additional Auction Napa Valley (ANV) events or exceptions for any other charitable events.
3. Direct Planning Staff to address all inconsistencies and/or questions pointed out in this analysis. Define terms used and confirm that values for those terms are consistent across all documents pertaining to the project.
4. If new studies need to be undertaken based upon the outcome of Item 3, above, Staff will direct Applicant or relevant County departments to prepare/update those studies.
5. Direct Planning Staff or Applicant, as relevant to submit a Transportation Mitigation Measure that applies to ALL vehicular traffic to/from the winery site, including construction traffic. ANY parking on Crystal Springs Road must be prohibited. ANY winery traffic on the southern section of Crystal Springs Road must be prohibited. Include an enforcement mechanism and citizen reporting process.
6. Schedule a Public Hearing to review the amended Use Permit application in 60 – 90 days.

Respectfully submitted,

Larry Vermeulen

December 1, 2023

Additional Comments on Vida Valiente Winery Use Permit

P20-00079

407 Crystal Springs Road, St. Helena, CA 94574

APN 021-410-013-000 and 021-372-001-000

Submitted by Larry Vermeulen

670 Crystal Springs Road, St. Helena, CA 94574

The Memorandum of Conditions of Approval, from The Napa County Fire Marshal's Office, dated 10/20/21 and attached to the packet "B" Recommended Conditions of Approval, states the following:

> 7. Roadways shall be a minimum of 20 feet in width with a 2 foot shoulder and 15 foot vertical clearance.

Napa County Road & Streets Standards (2023), defines "roadway" as:

> Any surface designed, improved or ordinarily used for vehicle travel that is either publicly owned and maintained, or privately owned and maintained, but dedicated for public use."

It appears that Crystal Springs Road meets the definition of "roadway".

The Final Traffic Impact Report, Vida Valiente Winery, Page 7, states:

> "Crystal Springs Road ranges in width from about 16 to 24 feet north of the Winery, and from about 12 to 18 feet south of the Winery."

The Final Traffic Impact Report, Vida Valiente Winery, Page 11, states:

> "The road has no centerline and intermittent gravel, or dirt shoulder areas."

The Memorandum of Conditions of Approval, from The Napa County Fire Marshall Office, also states:

> "All construction and *use of the facility (emphasis added)* shall comply with all applicable standards, regulations, codes and ordinances at the time of Building Permit issuance."

Given that Crystal Springs Road does not meet the County Fire Marchal's standard, and will not do so without a major upgrade by either the County or the Applicant, the Project cannot meet the Conditions of Approval.

Respectfully submitted,

Larry Vermeulen

December 1, 2023

Comments regarding transportation of cave spoils for Vida Valiente Winery Use Permit

P20-00079

407 Crystal Springs Road, St. Helena, CA 94574

APN 021-410-013-000 and 021-372-001-000

Submitted by Larry Vermeulen

670 Crystal Springs Road, St. Helena, CA 94574

Above is pictured a typical 8-yard “bobtail” dump truck. This truck will carry 7 to 8 cubic yards of cave spoils. It is a little over 8 feet wide. This is considered a “small” dump truck in the industry and is favored for its maneuverability. This truck is about 8’-6” wide. By comparison, a standard-sized pickup is about 6’-6” wide.

Applicants estimate that 19,400 cubic yards of cave spoils will be generated and will need to be disposed of off-site. They make no calculation for “fluff”, (the property of soils to expand considerably when excavated). Industry-standard practice is to assume a 50% “fluff” factor, so the 19,400 cu yards of compacted soils will likely result in a minimum of 29,100 cubic yards of materials to be trucked off-site.

Assuming maximum loading of the “bobtail” truck, that results in 3638 round trips as each truck must be loaded, driven to the disposal site, and return for another load. Given a typical estimated turn-around time for this operation, a single truck could manage 4 to 6 trips per day, depending upon how far away the dump site is. At this rate, it will take between 727 and 606 days to dispose of the spoils. Assuming a 5-day-a-week operating schedule this translates to 145 to 121 weeks of daily truck hauling to remove the spoils.

Goerge Caloyannidis has provided a spoils removal schedule in his “Appendix 5”, which assumes 4 dump trucks in operation each day. This presumes a larger excavation company with a sufficient fleet to

dedicate these resources. And it requires careful coordination of the loader and drivers. What I suspect it would lead to is longer idling times and dump trucks backed up onto Crystal Springs Road.

In any event, every time one of these dump trucks is on Crystal Springs Road, it becomes a one-way road at various places as we have convincingly demonstrated that the road is too narrow in many places for any oncoming vehicle to pass a truck of this size.

I fear that as the congestion becomes greater on the road, the truck drivers will ignore the Traffic Mitigation Measure to use only the north end of the road. The Traffic Mitigation Measure does not even address construction traffic, but clearly it must. The Applicants' own Traffic Engineer suggests that as many as 2 vehicles per hour would ignore the signage directing them to the north end of Crystal Springs Road. It would only take one of these large trucks to damage the narrow and undermined section of the road in the 600 block that I have documented in detail previously.

The dump truck above is a 12 yard "transfer" truck, often connected to trailer of a similar size for the transportation of 24 yards or more per trip. This truck is about 8'-6" wide but other models are 9' wide or larger. Applicants indicate that they might employ trucks of this size for cave spoils removal. This will obviously result in fewer total trips but will undoubtedly have negative impacts including longer idling/load time, greater disruption of traffic on Crystal Springs Road, and, as I discussed in detail in Item 8 of my comments dated December 1, 2023, the weight of a truck of this size might trigger a failure of the primitive retaining wall at the narrow section of Crystal Springs Road in the 600 block directly below my property.

Therefore, it is imperative that these large trucks not be allowed to run rough-shod over our substandard country road. A reasonable alternative would simply be on-site disposal of cave spoils.

Respectfully submitted,

Larry Vermeulen

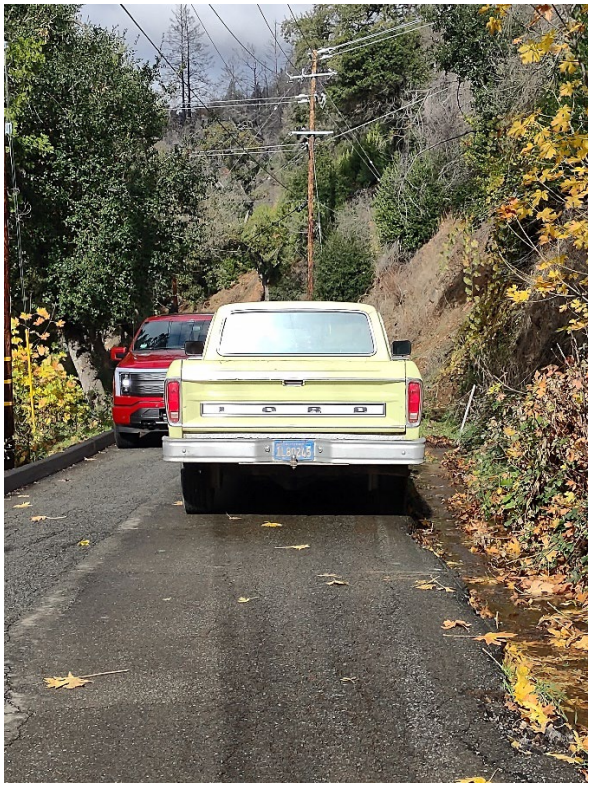
December 4, 2023

Addendum to comments by Larry Vermeulen submitted December 1, 2023

600 block of Crystal Springs Road showing typical road width of 12’ and 12’-6”

Addendum to comments by Larry Vermeulen submitted December 1, 2023

Two standard-sized pickup trucks trying to pass one-another in the 600 block of Crystal Springs Road where the pavement is only 12 feet wide



Appendix of Sources for Comments by Larry Vermeulen

Staff Report/Board Agenda Letter, by Matt Ringel, Panner II. Printed on 11/15/23.

Recommended Conditions of Approval, "B" attachment to Planning Commission packet. Not dated.

- Memorandum on the Conditions of Approval from the Department of Public Works, dated October 29, 2021.
- Memorandum of Conditions of Approval, from The Napa County Fire Marshal's Office, dated 10/20/21. Submitted as an attachment to "B" above.

Winery Use Permit Application and Project Statement, "D" attachment to Planning Commission packet. Dated February, 2019.

Final Traffic Impact Report, Vida Valiente Winery, "J" attachment to Planning Commission packed. Dated September 7, 2021.

Winery Comparison Analysis, "L" attachment to Planning Commission packet. Not dated.

Napa County Roads & Street Standards (2023) Approved by the Napa County Board of Supervisors, April 18, 2023.

PTAP-21 County of Napa Pavement Management Program PCI Map Book, dated 3/15/2021.

County of Napa Winery Database Listing, found here: Public winery database 2019-02-25.xlsm (d2l2jhoszs7d12.cloudfront.net)

From: Elyse Walker
To: Ringel, Matthew
Subject: Vida Valiente Winery
Date: Friday, December 1, 2023 12:31:59 PM

[External Email - Use Caution]

Dear Matt,

I am sending this letter in support of the Vida Valiente Winery project. I believe their investment in this project is a benefit to St. Helena in so many ways. The Drumwrights have proven to be such generous people focused on doing good in our community. Hayes Drumwright is a cancer survivor and he and Susana helped lead the charge in our Rockout Knockout Cancer event in St. Helena last year. They support Alzheimer's Research via Inspire Napa Valley and have led investments in Neurotrack which is leading the industry in early detection and delayed onset of the disease. Their foundation, which is tied to the winery, is doing amazing things for talented first generation low-income students at Stanford. Their stewardship of Memento Mori, a very successful wine brand they started in 2010, proves they have a serious commitment to creating memorable special brands and experiences for those looking to fall in love with our valley.

As we move to create a more thoughtful and caring Napa Valley, the Drumwrights and Vida Valiente are exactly the neighbors we want to hold up and promote. I hope they will be approved next week. Please let me know if there is anything else I can do to support them.

Sincerely,

Elyse Walker

Sent from my iPad

From:	PlanningCommissionClerk
To:	Ringel, Matthew
Subject:	FW: terrible idea about beloved crystal springs road/please forward
Date:	Monday, December 4, 2023 9:37:33 AM

From: Lauren Coodley <laurencoodley@sbcglobal.net>
Sent: Sunday, December 3, 2023 3:25 PM
To: PlanningCommissionClerk <planningcommissionclerk@countyofnapa.org>
Subject: terrible idea about beloved crystal springs road/please forward

[External Email - Use Caution]

It is time to recognize the effects and dangers posed by the changing climate and to the implementation policies along Crystal Springs Road in its entirety which is substandard in its Width, Turnouts, Radii, Road Surface and the over all Intent of State and Minimum Fire Safe Regulations. The CEQA-mandated cumulative impacts of this project must be analyzed in all their components and weighed against the rural character of this community, the existing wineries in full operation and foremost against those of ingress and egress during catastrophic fire events and the safety of residents, workers, employees and visitors. **The determination that this project's cumulative impacts are less that significant is a blanket statement not based on any analysis."**

From: PlanningCommissionClerk
To: Ringel, Matthew
Subject: FW: winery?
Date: Monday, December 4, 2023 9:37:15 AM

From: Bordona, Brian <Brian.Bordona@countyofnapa.org>
Sent: Monday, December 4, 2023 7:26 AM
To: PlanningCommissionClerk <planningcommissionclerk@countyofnapa.org>
Subject: Fwd: winery?

Get Outlook for iOS

From: lauren coodley <lcoodley@hotmail.com>
Sent: Sunday, December 3, 2023 3:26:10 PM
To: Bordona, Brian <Brian.Bordona@countyofnapa.org>
Subject: winery?

[External Email - Use Caution]

I receive cancer care at St Helena Hospital. It is already a threatened space that was closed due to fire during my treatment. I used to live on crystal springs road. It is the very last place to open a winery. Please pay attention to residents who know the fire danger and not put a commercial establishment in this very impacted rural space.

Thank you,
Lauren Coodley

Sent from Mail for Windows

From: PlanningCommissionClerk
To: Ringel, Matthew
Subject: FW: Vida Valiente project
Date: Monday, December 4, 2023 9:35:26 AM

From: Connie Wilson <clw1956@comcast.net>
Sent: Sunday, December 3, 2023 5:33 PM
To: PlanningCommissionClerk <planningcommissionclerk@countyofnapa.org>
Cc: Bordona, Brian <Brian.Bordona@countyofnapa.org>
Subject: Vida Valiente project

[External Email - Use Caution]

Dear Planning Commissioners and Brian Bordona,

I am writing to request that you do not grant a new use permit for the Vida Valiente project on Crystal Springs Road in St. Helena. I live on Crystal Springs Road, and this is not the appropriate place for a winery that will use a minimum of estate grown grapes and create an event center in an area that does not have an adequate road for construction traffic and visitors not accustomed to the condition of Crystal Springs Road. According to Napa County Fire Marshall's Office this area is prone to extreme fire danger, of which I can attest when most of our forest was burned in the Glass Fire. Crystal Springs Road does not meet the California State Board of Forestry Road and Street Standards adopted in April 2023, and therefore this project should be rejected.

I respectfully ask that you consider safety over development. As we have seen in the past, this is the wrong project in the wrong place. We the residents along Crystal Springs Road and neighbors nearby are concerned for our safety and rural lifestyle, and do not believe a winery event center with hundreds of visitors is appropriate on Crystal Springs Road.

Thank you for your consideration.

Connie Wilson
St. Helena

From: PlanningCommissionClerk
To: Ringel, Matthew
Subject: FW: Vida Valiente Proposal
Date: Monday, December 4, 2023 9:34:11 AM

From: Ralph DeAmicis <amicistours@gmail.com>
Sent: Sunday, December 3, 2023 2:29 PM
To: PlanningCommissionClerk <planningcommissionclerk@countyofnapa.org>; Bordona, Brian <Brian.Bordona@countyofnapa.org>
Subject: Vida Valiente Proposal

[External Email - Use Caution]

Dear Commissioners,
I cannot express strongly enough how bad an idea the Vida Valiente proposed expansion is. As a local tour guide I root for the wineries. But, I am much more knowledgeable about the quality and safety of Napa County's roads than most citizens. I drive them in all kinds of weather sober, which as we know is less common than we might hope.

Crystals Springs Road is barely passable. The road is narrow, rough, hemmed in against steep, unstable hillsides, and the signage is minimal and often obstructed by foliage. It is hard to find your way and I know where I'm going and I haven't been drinking. While fires would make the road a death trap, heavy rains dump massive amounts of water along the way. I carry a hand saw in my SUV as a safety tool. Why, because I once had to move a tree out of the middle of Crystal Springs Road on the way back to the Silverado during a massive rain storm, when a hillside came down and brought a tree with it. Luckily it was a pine and not an oak, and we had four strong men to move the tree. I carry the saw in case I'm by myself next time. Those steep, unstable hillsides pose a real danger. Unless Vida Valiente is prepared to dramatically upgrade the narrow, substandard road, this proposal should be rejected without question.

Ralph DeAmicis
Amicis Tours, Travel Books & Seminars
amicistours@gmail.com 707-235-2364
www.amicistours.com
Producing Books about Napa and Sonoma since 2007
Wine Country at Work TV since 2012 - PUC TCP-31301P

From: PlanningCommissionClerk
To: Ringel, Matthew
Subject: FW: Vida Valiente Winery
Date: Monday, December 4, 2023 9:34:26 AM

-----Original Message-----
From: Patricia Damery <pdamery@patriciadamery.com>
Sent: Sunday, December 3, 2023 3:10 PM
To: PlanningCommissionClerk <planningcommissionclerk@countyofnapa.org>
Cc: Bordona, Brian <Brian.Bordona@countyofnapa.org>
Subject: Vida Valiente Winery

[External Email - Use Caution]

Dear Planning Commissioners,

I urge you to vote no on the application of Vida Valiente Winery on several accounts.

Perhaps the most dangerous is the project's location on substandard Crystal Springs Road. Sections of this road do not meet the Road and Street Standards of our County nor the Minimum Fire State Regulations (SRA) adopted by the California Board of Forestry. MMTrans-1 to use signage to steer guests to sections of the road which have fewer substandard areas is outrageous and, quite frankly, flies in the face of the intent of the SRA. To increase more traffic on this substandard road is risking the lives of residents, visitors, and first responders as well. Cal Fire requires that the road conditions are within the state guidelines at the time of the permitting. This clearly is not true.

Second, this project will be a substantial increase in visitation and intensity use in an area that does not have the proper ingress and egress. Cumulative studies have been done in times of the least amount of traffic. Already there are three wineries in this area, which is already questionable. Much more study needs to be done on the impact of such a project, given what is already present.

There are some places that we should not continue to develop, and Crystal Springs Road is one of those. Please vote now on this project as submitted.

Sincerely,
Patricia Damery

From: Jake Krausz
To: Ringel, Matthew
Subject: Vida Valiente
Date: Monday, December 4, 2023 4:01:03 PM

[External Email - Use Caution]

Mr. Ringel,

This letter is to support the approval of the Vida Valiente Winery on December 6. This small family-owned endeavor will be a positive new addition to our valley's agricultural community. The owners, the Drumwright and Kaplan families, are passionate about organic farming, no-till farming, and being the best stewards of their land. It is rare to find individuals with such a long-term vision of a site who genuinely care about the environment, the community around them, and the future of Napa Valley.

Being organic stewards of our property for the last 35 years, we believe these philosophies aren't some trend or fad but more a passion and way of being that people truly live by. We recommend approving this project to allow an excellent site to be thoughtfully established and stewarded into the future.

Respectfully,

Jacob Krausz
2nd generation Vintner
Arkenstone Estate Winery
Howell Mountain, Napa Valley

SAFRR

State Alliance for Firesafe Road Regulations

firesaferoadregs@gmail.com

Comments from SAFRR on Vida Valiente Winery Proposal P20-00079

December 4, 2023

To the Planning Commissioners of Napa County
planningcommissionclerk@countyofnapa.org

Cc: Brian Bordona, Director of Planning
Brian.Bordona@countyofnapa.org
Matthew Ringel, Planner
matthew.ringel@countyofnapa.org

The State Alliance for Firesafe Road Regulations (SAFRR) works to ensure that California's public safety road standards provide for safe and concurrent evacuation and firefighter access, and that local jurisdictions properly implement these State Minimum Fire Safe Regulations.

SAFRR respectfully requests that the Napa County Planning Commissioners deny the winery permit application P20-00079 by Vida Valiente, as its approval would violate the Title 14 State Minimum Fire Safe Regulations. It would jeopardize the safety of residents and firefighters due to subpar access roads as well as its location in a high fire risk area.

Areas of noncompliance with the State Minimum Fire Safe Regulations include:

1) Lack of 20 ft road width, with a minimum of two 10 ft wide traffic lanes (excluding striping and shoulders), as required under § 1273.01(a).
2) Lack of safe concurrent emergency wildfire equipment access and civilian evacuation, which is required pursuant road specification in §§ 1273.00-1273.09 (Article 2).
3) Lack of compliance with other road standards listed in Article 2, such as grade and curve radius.

The applicants propose that visitors will only access the winery from the North access on Crystal Springs Rd, which is also subpar and less than 20 ft wide. To meet the requirements of the State Fire Safe Regulations, every structure and commercial business needs to have two legitimate access roads (ie, access can't be via dead-end roads) that meet the road specifications listed in Article 2 of those regulations. Thus, the entirety of Crystal Springs Rd, as well as it connection to Sanitarium Rd and Deer Park Rd to the connection with Silverado Trail at both North and South ends must meet the road specifications of Article 2 of the State Fire Safe Regulations.

Exceptions were not requested and also would not be applicable to Crystal Springs Rd. It is important to understand that Exceptions under the State Fire Safe Regulations are limited to alternatives that provide the Same Practical Effect for the Defensible Space that is clearly defined in § 1270.01(f) as being limited to "the area encompassing the parcel or parcels proposed for construction and/or Development". This is the area under control by the applicant for making road improvements. This application to Exceptions is the only use of this defined term Defensible Space in the State Fire Safe Regulations. The applicant would need to ensure that all roads within the development parcel meet the state standards, and before any new development could occur, County would also need to bring the entirety of Crystal Springs Rd up to the road standards in Article 2 of the State Fire Safe Regulations as well as the portions of Sanitarium Rd and Deer Park Rd that connect its South end to Silverado Trail.

Furthermore, the State Fire Safe Regulations require that all commercial operations be accessed by Roads (not Driveways) meeting the conditions of Article 2 (i.e., 20 ft wide, grade, curve radius and surface requirements, etc). See definition of Road in § 1270.01(y) which includes all commercial occupations, and Driveway in § 1270.07(i), which is limited to residential and non-commercial buildings.

We appreciate your dedication to achieving public and firefighter safety, and to upholding state law in the State Minimum Fire Safe Regulations.

Sincerely,

Deborah A Eppstein, PhD
Director, State Alliance for Firesafe Road Regulations

CC:
State Alliance for Firesafe Road Regulations (SAFRR)
Brian Bordona, Director of Planning, Napa County
Matthew Ringel, Planner, Napa County

From: Peter Working
To: Ringel, Matthew
Cc: Gerry Working
Subject: Comments on application of Vida Valiente Winery - Use Permit #P20-00079
Date: Monday, December 4, 2023 2:29:08 PM

[External Email - Use Caution]

Good morning, Matthew. Please see our comments on the above referenced use permit below. These comments are intentionally brief, since I wished to void repetition. However, we agree full with the comments already provided to the Planning Commission by Larry Vermuelen, George and Christina Caloyannidis, and Richard Martin.

To provide context for our concern, my wife Gerry Robertson Working has resided at 401 Crystal Springs Road (CSR) part- or full-time since 1960 (63 years). She and I have lived here full-time for nearly 14 years and been the sole owners of the property since 1988 (33 years). Of relevance to our comments, our property is directly adjacent to 403, sharing a common property line for well over 1500 yards. We, then, are arguably going to be the most affected by the installaion of a commercial and entertainment facility on the site.

This should no means be considered a comprehensive list all of our issues with the application, which have been as discussed in detail by others. Our specificl concerns follow:

- The applicants, who have owned the property for 4 years or more, have never shown any concern or responsibility toward property upkeep, which is essentially a shambles despite the clearance of the burned buildings. Nearly all of us on Crystal Springs Road have labored to repair or mitigate the damage from the Glass Fire. We, for example, have cleared all the dead and highly flammable burned fir trees on our property. We removed hundreds of them; the owners of Vida Valiente have removed none. They are a both safety and fire hazards. On upside, we can easily tell the location of the property line (see the photo below). We fear that owners of the property will continue to show a similar disregard for neighbors and others who frequent the area of CSR and have no confidence in them. Thus far, they have been absentee landlords. Why would we expect that to change?
- The owners or their agents have displayed what I've heard termed 'willful ignorance' in their application in an attempt to sidestep obvious issues.
    - "No pedestrians are anticipated as there are no pedestrian paths along Crystal Springs Road or any other local roadway." The owners know full well that this is untrue and that dozens of people walk this road every days. IWillful ignorance
    - "Class I/ bicycle lanes are provided along Silverado Trail and Deer Park Road (Silverado Trail to SR 29) and bicycle racks will be provided for all employees or guests biking to the site." How is this even relevant to CSR? This an attempt to also say that there are no bicyclists on CSR. Willful ignorance.
    - The comment that winery traffic will come in from the north, not the south—how will that be controlled? This is another specious argument. Willful ignorance.
    - This icrea.

This is not a fun little winery. This is an outsized and overbuilt commercial custom crush and entertainment complex. It does not belong in the rural CSR area. If this application is to be approved, the project must be radically downsized in every aspect to. The entertainment plans must be curtailed and the plans for custom crush be clarified and likely also downsized. As

proposed, it does not belong in this rural neighborhood.

We strongly oppose this project as proposed.

Respectfully,
Gerry Working
Peter Working


West property line between Vida Valiente land and Working land.

Eric N. Sims
702 Sanitarium Road
Deer Park, CA 94576

December 4, 2023

Comments on Use Permit #P20-00079

Vida Valiente Winery Application

My piece of property borders both Sanitarium Road and Crystal Springs Road.

Both my wife and I work in the wine industry. And, I am an Adjunct Professor at Sonoma State in the Wine Business MBA.

I am a fan of the Napa wine business. But, I do not support this project for a few reason.

First, the headcount numbers are too low and completely unrealistic (details below.)

Second, there is no mention of the potential for dynamite traditionally required to drill caves in Napa County. At a minimum the cave driller must inform us how much dynamite will be they estimate will be required for the Vida Valiente caves.

Third, Crystal Springs Road is simply the wrong location for a commercial business. It is just too narrow in many parts of the road.

Four, if Vida Valiente is approved for 30,000 gallons then Hundred Acre (currently 19,000 gallons) and Merus (currently 20,000 gallons) would be crazy not to seek an increase in their permits to the same level of production as Vida Valiente. So, the actual increase in production could be 30,000 gallons for Vida Valiente plus an additional 21,000 gallons from Merus and Hundred Acre as they increase their production. That is 51,000 gallons of new production on Crystal Springs Road.

Five, what is the processed waste plan so close to Crystal Springs Creek?

Why small luxury wineries require more head count.

The more expensive the wine the more head count. This is counter intuitive. Smaller wineries require more head count. When I was the CFO at Peju winery on Highway 29 it was common for two or three hospitality employees to see hundreds of guests. The current trend at high-end wineries, such as Vida Valiente, is to have one Winery Ambassador per each visiting group (usually four people.) I am sure the grounds will be beautiful and require multiple landscapers. High-end wines must be tissue wrapped when sold. FedEx and UPS will be on Crystal Springs daily to ship wines.

The more expensive the wine the more labor in the vineyards. This labor can be a Farm Labor Contractor (FLC) or employees of Vida Valiente. But, this labor will be more direct or indirect

(out sourced) labor. Workers that must drive on Crystal Springs Road. If Vida Valiente is farmed organically that is even more labor.

The more expensive the wine the more seasonal and full-time cellar workers. Expensive wines are hand sorted often in the vineyard by one team and again in the winery by a second team. Labor intensive barrel fermentations or small tank fermentations require far more hand labor than the large efficient wineries looking to minimize labor costs. It is actually the high cost of these luxury wines that makes the expansion of hand labor possible.

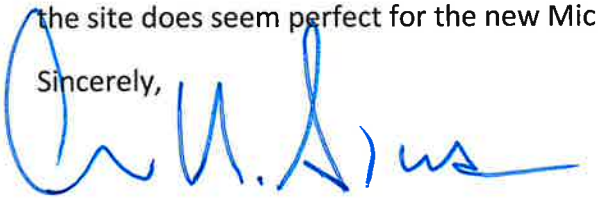
Events require many servers, chefs, Bright Equipment Rental trucks before and after. For these events the staff to guest ratio must be kept close to ensure the luxury feel.

If I received a wine business plan for 30,000 gallon winery from a student in the Sonoma State University Wine Business Program that did not include a General Manager, Controller, A/P and A/R clerk, Hospitality and Events Manager, Vineyard Manager, Winemaker and two full-time cellar works, Wholesale Sales Manager, and Marketing Manager, Facilities Manager, and Janitor I would be very inquisitive about who was going to do all the work required at all wineries – regardless of location. Napa County should ask these questions of Vida Valiente's head count estimates. Sadly, I believe wineries have been trained to tell the county absurdly low numbers during the application and then do whatever they want once approved.

All the people above drive cars to and from work on a road two cars can barely pass on.

Vida Valiente (as currently proposed) is simply the wrong sized project for this location. But, the site does seem perfect for the new Micro Winery Permit.

Sincerely,



Professor Eric N. Sims Ph.D.
Wine Business Program
Sonoma State University

And, C.F.O. at a small Napa Valley Winery

From: Ryan Stetins
To: Ringel, Matthew
Cc: kellyrstetins@gmail.com
Subject: Vida Valiente | Show of Support | Hearing December 6th - The Stetins
Date: Monday, December 4, 2023 3:02:15 PM

[External Email - Use Caution]

Matt,

The intent of this letter is to advocate for the approval of the winery license application for Vida Valiente: via-a-vis, Drumwrights & Kaplans.

I've had the pleasure of knowing the Drumwrights and Kaplans for over a decade. I meet Hayes and Susana through the industry, and they are now big supports of both of my local businesses, Compline Restaurant and Compline Wine Shop. Sam and Nancy have been my neighbors since 2014 and I can't think of a more thoughtful and caring couple. Sam's career has been spent representing some of the top producers in Napa. His winemaking talents have brought notable accolades not only to his clients, but also to Napa Valley as a whole.

The Kaplans and Drumwrights have partnered together on other successful projects; Memento Mori and Maxem Wines, and both exemplify the quality of their respective appellations. They will undoubtedly bring that same energy, care, and culture to their new project Vida Valiente.

The Drumwrights purchased the property in question in 2016. Since then, they have shown their amazing stewardship to the land by planting according to sustainable and regenerative methods, not only once but twice due to the Glass Mountain fire in 2020. They have also taken measure to ensure the estate is cleared and provides defensible space for their property and surrounding neighbors.

We are hugely in support of this application and hope that it gets approved.

Thank you for taking the time to read our thoughts.

Kelly and Ryan Stetins

Ryan Stetins
Partner
Compline Restaurant 1300 First St. #312
Compline Wine Shop 1300 First St. #319
Napa, CA 94559

707-492-8150

From: Meghan Zobeck
To: Ringel, Matthew
Subject: A Letter of Support of Vida Valiente Winery
Date: Monday, December 4, 2023 5:43:37 PM

[External Email - Use Caution]

Dear Matt,

I am sending this letter in support of the Vida Valiente Winery project. I am the Winemaker at Burgess Cellars and have known the Drumwright and Kaplan families for the past 7 years. I have a deep understanding of Sam Kaplan's farming and winemaking practices and know he will be an incredible agricultural steward of the land. I know the Drumwrights have a focus on lifting others across the Valley and specifically with this project and their Foundation. They will be very thoughtful neighbors and approving this Winery will be great for St. Helena and the entire Valley.

Sincerely,

Meghan Zobeck

December 4, 2023

Robert & Becca Reichenberger
339 Crystal Springs Road
St. Helena, CA 94573

RE: Comments on Vida Valiente Winery Use Permit
Use Permit #P20-00079

The purpose of this letter is to convey our opposition to the Vida Valiente Winery Use Permit and project as submitted. Our primary concern is the additional traffic that will be caused during the construction and operational phases of the industrial winery and recreation event center due to the size and scope of the project as outlined in the application.

The Final Traffic Impact Report states, "the (yearly) Winery trip generation would be 14,648." This is a significant increase in the volume of traffic on Crystal Springs Road. Crystal Springs Road is very narrow in spots (12 ft wide in some areas), has no shoulders on either side, has no guard rails, and exhibits very steep drop-off cliffs aside the road. Crystal Springs Road is a small, narrow road and is inadequate for this amount of additional traffic caused by the proposed processing facility and entertainment center. The added traffic proposed by such a facility is irresponsible & dangerous, inviting serious injuries to the current residents in the area who we daily observe utilizing Crystal Springs Road for neighborhood biking, walks, and normal vehicular use.

For these reasons, we are opposed to Vida Valiente industrial grape processing facility and entertainment center. In the interest of compromise, we are not opposed to a smaller estate grown only winery that puts less vehicular demand on the road.

Respectfully,

RWR LRR

Robert & Becca Reichenberger
339 Crystal Springs Road, St. Helena, CA

From: Desmond Echavarrie
To: Ringel, Matthew
Subject: Vida Valiente | Show of Support | Hearing December 6th
Date: Tuesday, December 5, 2023 8:46:06 AM

[External Email - Use Caution]

Dear Matthew,

First of all, thank you for all that you do to support our community. I am writing to express my support for the Vida Valiente Winery project up for a hearing on December 6th.

Vida Valiente was founded by Drumwright and Kaplan families. I consider both Hayes Drumwright and Sam Kaplan to be valuable mentors and supporters of my business, Scale Wine Group. They both take every possible opportunity to help other entrepreneurs and winemakers in Napa Valley.

The Vida Valiente Foundation, which the winery revenues will support, provides critical scholarships and mentoring for first generation low-income students who have been accepted to Stanford. As you might imagine, most of these extraordinary kids come from immigrant families with few resources and little support.

I am convinced the VV Foundation will bring back to our Napa Valley community two-fold what it is giving to these future leaders. It is an example of a wine brand moving in the right direction to embrace the next generation of wine enthusiasts who will become our future consumers.

My hope is that you and your fellow members agree that Vida Valiente is not only worthy to build a winery home here, but that they stand poised to offer a lot to our community and deserve to be supported. Thank you for your consideration!

My very best,

Des

Desmond Echavarrie
Founder
Scale Wine Group
O: (707) 637-4715 M: (707) 815-1533
DES@SCALEWINE.com
SCALEWINE.com

Click to view our current portfolio.

From: Celia Cummings
To: Ringel, Matthew
Subject: Use Permit Application of Vida Valiente Winery
Date: Tuesday, December 5, 2023 11:49:55 AM

[External Email - Use Caution]

Dear Mr. Ringel,
I live at 498 Crystal Springs Road in St. Helena, and I have several comments in regard to this application for a winery on Crystal Springs Road.

LIGHT POLLUTION: lighting used during harvest time is exempt from the stated proposals. That could mean lighting used by the people doing the harvesting, and/or it could conceivably refer to lighting for events during that time.

NOISE: Presumably, events will be held indoors, but will the doors to their events be strictly closed or left wide open, allowing the noise from auctions and other events to be heard by neighbors? I think that event attendees will expect that they can wander outside with their wine, and will they carefully close the doors behind them? I strongly doubt it.

TRAFFIC: In the DPW memo of October 29, 2021, it is stated that there will be NO parking along the street. However, in the application, it is stated that there may be parking on both sides of Crystal Springs Road during events AND during harvest.

Drinking on the site will be allowed. And then afterwards, of course, those drivers will be on our road, which is challenging enough for sober drivers. I doubt that all of those drivers will pay attention to the winery sign that encourages them to enter/leave the winery by heading North on Crystal Springs Road.

I strongly urge that everyone connected with the possible approval of this application, be required to drive the section of Crystal Springs Road which runs SOUTHWARD from the proposed winery site, not just the section of the road which runs from the proposed winery site north toward the Silverado Trial.

ANV regulations: It is stated that additional events may be allowed, with no specifications given.

WATER: This is another big problem in our area, and we are already being asked to conserve water again. In reading all this material, I did see one positive statement, to the effect that if it is determined that there is insufficient water, the application could be revoked.

Respectfully submitted,

Celia Cummings

Christopher K. Cole
140 Rose Lane
St. Helena California 94574

December 4, 2023

Napa County Planning Commission
c/o Matt Ringel
Napa County Planning, Building and Environmental Service Department
1195 Third Street, Suite 210
Napa CA

via email: matthew.ringel@countyofnapa.org

Re: Public Comment
Vida Valiente Winery - Use Permit #P20-00079
407 and 461 Crystal Springs Road, St. Helena

Dear Mr. Ringell;

I have reviewed the project reports on the County website. This project will significantly impact the greater neighborhood. The scale of this project is beyond the character and capacity of what we will call the Rossi Valley.

My comments address the Biological Resources, but also include the obvious, as follows:

"B" Conditions of Approval:

4.2: Tours and Tasting:
The marketing program is clearly out of line with the capacity of Crystal Springs Road; 120 visitors a week, monthly food pairings for 24, release events for 60, auction events for 125. This is an event venue, not a quiet winery with a negative declaration.

4.6: Grape Source:
If the "75% Napa Valley" was changed to "75% Rossi Valley", I believe that the owners would find some neighborhood support.

7.4.a.a Construction Mitigation: For earth-disturbing activities:

This is the focus of my public comment, as it relates to the Biological Resources Assessment. Due to the scorched condition of the immediate site, the pre-construction survey radius should be increased from ".25-miles of project activity" to .40-miles (approx. 2,000'). There are listed

sensitive species that will be impacted by site activity within the 2000' radius. The actual exclusion buffer radius for construction should be determined by a local biologist who is "experienced in the biology and natural history of local avian resources." (from Mitigation Measures: Sec. a.)

"C" Mitigated Negative Declaration:

IV. Biological Resources:

a. "Less than significant impact" should be changed to "Potentially significant impact".

Discussion:

d. The Napa County Baseline Report correctly states that steelhead move through Bell Creek "outside of the northeastern corner of the property". It is worth noting that steelhead do run in Bell Creek, even though the Wildlife Assessment states "habitat not present". (Only the stream setback is on-site.)

"E" Biological Resources Assessment:

The entire project area has been severely impacted by wildfire. The wildlife inventory should include some surviving, healthy habitat that is located within a 5000' radius of the project area. This will replicate pre-fire conditions and representative wildlife habitat on-site. Including this un-impacted habitat can indicate what was present or could be potentially present in the future. This 5000' "radius" is applied to the listed sensitive species noted below.

Table 3:
The following fauna have been classified with "potential habitat" or "habitat not present" in the CNDDB Sensitive Wildlife Species list. These species are present when the healthy "radius" is applied:

- Steelhead-Central California Coast DPS: Noted as "habitat not present", but it is seasonally present within 100' of the site.

- Bald Eagle: Noted as "habitat not present," but is present within the healthy radius. Most recently observed on November 22, 2023.

- Great Blue Heron: Noted as "habitat not present.". This species was found as roadkill in spring 2021, on site, near the Bell Creek bridge at the current location of the project deer fence. This bird has a low trajectory when taking flight and is subject to vehicle strikes. It is present on site and along the Bell Creek corridor.

Christopher K. Cole
140 Rose Lane
St. Helena California 94574

- Yellow Warbler: Listed as "possible habitat present." Observed September 16, 2023, within the radius. A migrating individual bird, in flock, which has riparian habitat on site.

Twenty wildlife species are listed on the sensitive species list. Only the steelhead is identified as having "moderate to good" habitat (in another section of the report). But four of these twenty species are definitely present within the healthy radius.
Is this what happens when an inventory is taken after a devastating wildfire?

The wildlife inventory should encompass a larger radius that includes surviving islands of representative, un-impacted habitat.

"G" Northern Spotted Owl Report:

The report may be correct in that there are no known Northern Spotted Owls (NSO) detected within 1.3 miles of the site. What I find unusual is the that three survey stations are conveniently located on Sanitarium Road (near the hospital), at the site, and near Crystal Springs Road North. If the transect was rotated so as to include Bell Canyon, historic (pre-Glass Fire) habitat for NSO does exist. This comment is supported by the DFW Public Comment of November 11, 2023.

<u>Survey Compliance to Protocol:</u>

From the report: "Other Owl Species Detected: No"

Western Screech-Owls and Barn Owls are breeding within 1500' of Station #K2. Great Horned Owls are also present. These three owl species were missed during the 10-minute point count survey at #K2, but they are present within the transect.

While none of these findings may be fatal to the project, there are significant shortfalls in the reports. There will be cumulative effects that go beyond the immediate property. The most obvious to everyone is increased road traffic.

This public comment addresses the biological impacts that appear to have been unrealistically inventoried and underestimated in the submitted Biological Resources Assessment. I am not requested a new Resource Assessment. I am only offering what we know to be present in the vicinity of the project area when healthy, living habitat is included.

Christopher K. Cole
140 Rose Lane
St. Helena California 94574

In summary, the impact of this project on the biological resources has been underestimated. Further mitigation would serve to reduce this impact. This can be done by:

1. Downsizing the exterior building footprints.
2. Minimizing traffic by reducing the marketing plan and by sourcing fruit from Crystal Springs Road, in the Rossi Valley.
3. Carefully monitoring the construction process; stream setbacks, nesting avifauna, etc..
4. Post-construction invasive plant monitoring of the Crystal Springs Road corridor for 5 years following occupancy.
5. Consideration of the requirements for native plantings per pending California AB 1573.

Please consider all significant impacts in your evaluation of this project. Thank you.

Sincerely,

Christopher Cole
ckcole@comcast.net

From: Dustin Mowe
To: Ringel, Matthew
Subject: Vida Valiente Winery Use Permit
Date: Tuesday, December 5, 2023 12:40:54 PM

[External Email - Use Caution]

December 5, 2023

Matthew Ringel
Napa County PBES
1195 Third Street, Second Floor
Napa, CA 94559

Via email to Matthew.Ringel@countyofnapa.org

RE: Vida Valiente Winery Use Permit

Dear Mr. Ringel:

My name is Dustin Mowe, and I am the property owner at 3424 Silverado Trail N, Saint Helena, CA, situated less than 1 mile from the location of Vida Valiente's proposed winery at 407 Crystal Springs Rd.

Having engaged in comprehensive discussions with Hayes Drumwright and Sam Kaplan regarding Vida Valiente's proposed winery, I have had the opportunity to review the associated site plans and the intended activities. I am pleased to express that I harbor no reservations whatsoever concerning their proposed intentions. The ownership of Vida Valiente has consistently demonstrated impeccable integrity, and the envisioned winery is designed to be low-impact, strategically positioned on the site with careful consideration, making it a commendable addition to the community.

In light of the aforementioned, I wish to formally communicate my wholehearted support for the Vida Valiente winery project. I am confident that, given their commitment to integrity and the conscientious planning of the proposed facility, it will prove to be a valuable and harmonious asset to the nearby area.

Again, I fully support this project. Thank you.

Sincerely,

Dustin Mowe
dustin@mowenapavalley.com
707-695-9700

From: PlanningCommissionClerk
To: Ringel, Matthew
Subject: FW: Viva winery
Date: Monday, December 4, 2023 4:14:42 PM
Attachments: Vida-Valiente-Comments.pdf

From: Alexandra Harner <alexandraleigh@me.com>
Sent: Monday, December 4, 2023 4:02 PM
To: PlanningCommissionClerk <planningcommissionclerk@countyofnapa.org>
Cc: Bordona, Brian <Brian.Bordona@countyofnapa.org>
Subject: Viva winery

[External Email - Use Caution]

Hello, I am a resident of Deer Park on a small lane off Crystal Springs Road and I have just been made aware of this potential project that I can say I have serious concerns about!

I have included the below PDF which provides a much more detailed outline of the issue here. I can say I am against the building of this winery in our small community!

-Alex Harner
Rose Ln

From: Shawn Moura
To: PlanningCommissionClerk
Cc: Shawn Moura
Subject: COMMENTS ON USE PERMIT #P20-00079 - VIDA VALIENTE WINERY APPLICATION
Date: Tuesday, December 5, 2023 2:59:54 PM

[External Email - Use Caution]

COMMENTS ON USE PERMIT #P20-00079

VIDA VALIENTE WINERY APPLICATION

My name is Shawn Moura and I live at 236 Crystal Springs Rd. I live on the NorthFfork which is the smaller dead end side accessed from the Silverado trail.

There are 10 parcels on the north fork.
2 wineries, 4 offer tastings but don't have a winery

Of the remaining 4, two have full time residents.

2 out of 10 are residents. I am fortunate to have respectful commercial neighbors who I waive at daily, but I often feel unsafe walking my dogs and kids on the road because of the traffic on the narrow roads with several blind turns. Because of that, I mainly walk on the main side of Crystal Springs 4-5 times a week.

I don't know the parcel count or count of working wineries and tasting permits on the main road, but as a resident I urge you to not let the main Crystal Springs become what my road has become.

I would never want to keep a land owner from fulfilling a dream of owning a winery. I am not asking that this landowner be denied a winery. I'm asking that the county require the development to match what the road and the residents can take on. The proposal being considered today is massive. If this proposal and the existing road are in conflict, then please ensure you are addressing the issues holistically while thinking about what happens the next time a parcel comes to this board with a winery next year, two tasting permits the year after that and then another winery a few years later.

It will happen just as it has on mine. Your residents are asking your help to ensure this rural road doesn't become commercial. Please support the residents.

I would also urge you to consider that Crystal Springs road is on the bus route for the St Helena schools. Safety of the road conditions must be a priority in your decision making process. Please take the time to drive the road, it's a beautiful road.

Thank you,
Shawn Moura

WATER AUDIT CALIFORNIA

A PUBLIC BENEFIT CORPORATION

952 SCHOOL STREET #316 NAPA CA 94559
VOICE: (707) 681-5111
EMAIL: GENERAL@WATERAUDITCA.ORG

December 5, 2023

County of Napa
Planning Commission

planningcommissionclerk@countyofnapa.org
Dave.Whitmer@countyofnapa.org,
Megan.Dameron@countyofnapa.org,
Kara.Brunzell@countyofnapa.org,
Heather.Phillips@countyofnapa.org
AndrewMazotti@gmail.com
Matthew.ringel@countyofnapa.org

RE: Hearing – December 6, 2023
HAYES DRUMWRIGHT / VIDA VALIENTE WINERY / WINERY
USE PERMIT #P20-00079
APNs 021-410-013-000 and 021-372-001-000

Water Audit California ("Water Audit") is an advocate for the public trust.

Rather than reiterating Preliminary Objections yet again for the record, we hereby incorporate them from the attached as if set forth in full.

If planning applications were complete and truthful one could reasonably endure the burden of review, but virtually every Napa Planning Application is a skillful handcrafted exercise in misdirection. This is soul destroying and tedious. Absent unforeseen circumstances, this will be Water Audit's last comment letter for some time. As Einstein is credited with saying, one cannot remedy a problem on the same level that it was created.

Chair Whitmer has more than once complained at the lateness of our oppositions, but please understand this. We have learned through hard lessons that what was proposed and

noticed on the CEQA State Clearinghouse is not what was noticed by the planning commission to the public. What is ultimately before the Planning Commission is usually yet a third thing; these are the documents on which you make your decision. We have to wait to learn what is included in the last iteration, which occurs only three working days before your meetings. It is only at great expense, substantial difficulty and numerous lost weekends that comments are able to be made. We have always given you our best honest assessments, however uncomfortable the truth may be.

We have observed that over the last while our comments have fallen into two broad categories. Only the first category should be necessary: the merits of the application and applicable matters of policy, such as the applicability of the public trust doctrine and the need to address surface water/groundwater interface.

Unfortunately, a second category of problems, repeated non-conformance with basic procedure, has overtaken the first category in frequency, volume and effort to assess. We make this effort to comment in the public interest, with expensive and dedicated staff. An orderly, complete and equitably applied process is not too much to expect. Please do the basic courtesy of reading this comment before ignoring it, and don't disregard it simply because facts make you uncomfortable.

Consider just the last few weeks. In Rutherford Winery the existence and reports of adjacent wells was excluded from the information reviewed by the Planning Commission to obscure operational impact on groundwater levels and interconnected surface water flows. In Inglenook, the CDFW was not notified of the entirety of the project before the Commission, and therefore the comment letter received was able to be mispresented by the Applicant. In Vineyard 29, the applicant did not disclose or address the presence of a City of St. Helena water line which serves an adjacent property, or the proximity driveway expansion adjacent to a creek. In Duckhorn, in one of the funnier occasions, a written contractual obligation to provide a left turn lane provided by Dan Duckhorn himself was omitted from the record of the Planning Commission that concluded (thirty-five years of traffic growth later) that a left hand turn lane was not required. Chairman Whitmer made dismissive comments regarding the late comment by CDFW for Duckhorn, and yet the approved project still did not include the fracking

mitigation the agency demanded and what was orally *promised* on the record. There are innumerable other occasions that we simply do not have the time to list.

In this instance, a vineyard miraculously appeared on County GIS website of the subject property sometime after 2018 and before 2020. Reference to the County GIS images show that in 2018 there were no vines planted on the subject property and yet today here they are. County Ordinance 16.28.010 requires that all projects disturbing greater than 1 acre obtain an Erosion Control Plan. County records do not contain any reference to an application, permit or inspection of completed erosion works. In short, this Application seeks to normalize a code violation without disclosure or discussion. Most importantly, staff have made no note of this condition.

A swale runs across the property *fed by an unauthorized diversion from Bell Canyon Creek* and draining back into Bell Canyon Creek on the lower side of the property. The project documents on CEQA did not disclose to CDFW the swale or proposed culvert work on the swale, thereby preventing CDFW review.

The Applicant, by fabrication and misdirection, has turned Bell Canyon Creek, an environmentally critical watercourse, into less than an ephemeral watercourse in their effort to avoid a proper Tier 3 analysis. Applied Civil Engineering reported at agenda packet 353 the project hydrogeologist was preparing a water availability study, stating “a new well will have to be drilled” and a new water quality analysis performed. The water availability analysis makes no reference to a new well and attaches an outdated water quality report replete with references to “orange haze.”

A site visit was performed by a geologist, not a hydrogeologist or geomorphologist, who made the pity observation that the creek was flowing.

A new well was drilled without a permit. The Tier 2 well interference study appears to locate the neighbor’s well about one thousand feet further away than its actual location. Well testing was inadequate in form and time. Interference assessment is based on theoretical modeling, rather that readily available field data.

New vineyards have been planted inside the riparian way. Staff reports there is no flood hazard, and yet the applicant’s site plan notes flood hazard in bold type. The location and

nature of an existing well are obscured by absence of a well completion report. There is no discharge plan in the Conditions of Approval as required by State regulation. There is no groundwater memorandum. The is no history of permits, no checklist, no proof of notice, no Vegetative Canopy Cover Vegetation Plan and no evidence of grape sourcing for the 75% of the grapes that will be trucked up the hill to this location.

The Application is internally inconsistent. Agenda Packet 7A. VIDA VALIENTE attachment B. COA pdf36 PROJECT SCOPE 1.1 b. omits water storage tanks [Agenda 1,107sf water storage].

Things have not always been this way. A vineyard conversion application by the adjacent property, Seiler Family Vineyards, (previously Criscione Vineyard) APN 021-420-042-000, P13-00396, dated November 13, 2013, was approved by a letter dated February 20, 2014. In addition to an erosion control plan and inspections it contained a Hazardous Materials Management plan and an NCRCD environmental inspection. Although our review of the Seiler project was superficial and intended only to establish the falsity of the Tier 2 analysis by gross misrepresentation of location of the adjacent “Neighbor Well”, unlike the subject application, the Seiler application appears to be reasonably complete. We wonder whether the degradation of work product from County staff under Planning Director Pete Parkinson to the sad efforts that are the norm today are merely coincidental, or actually intentionally caused by then incoming Planning Director David Morrison, and with his sad legacy now continued by Planning Director Bordona.

Let us consider a really basic issue. It should be self-evident that an application should accurately state the parcels that are affected, and yet habitually planning applications do not encompass the entirety of the land impacted. Location maps, and USGS topographical maps, and DWR records are chronically omitted, or on occasion modified without attribution. In Bremer, the application omitted the APN on which an extensive cave development was proposed. On Inglenook the parcels that are going to have extensive driveway work immediately adjacent to a fish-bearing water course were omitted. These are but a few of the numerous occasions on which this omission has occurred, inevitably intended to obscure troubling work that deserves review.

Herein the Application cites only one APN: 021-410-013, but in fact staff makes reference to two APN. In this instance, the APN that has the existing septic field and well, (APN 021-372-001), has not been included in the application. There is not an easement agreement between the dominant and subservient parcel. As a matter of County policy an easement is required in the event that in the future property title is vested in different owners. The Application relies upon the existing well to be a backup to the project "New Well for the proposed public water system well". Parcel reports identify the existing well as being destroyed and that well destruction permit number is now assigned to the "New Well" water completion report. No well is discussed inside the Water Availability Study.

A DWR Well Completion Report (i.e., driller's log) is not available for the Existing Well, represented to be integral to the proposed project. See:

> The Existing Well was constructed with steel casing having an inside diameter of 8 inches; the drilling method used to construct this well is unknown. b. The total casing depth was reported to be approximately 172 ft, as reported by RWTS in their documentation for the April 2019 pumping test of this well. c. The types, sizes, and depths of the casing perforations and the type and gradation of the gravel pack used for well construction are not known.

See also Agenda Packet 7A, page C1 of 8

Further, although a new well has been drilled, the work was done without a well drilling permit, a technical requirement that arguably has importance in the law than in fact. Nevertheless, staff should have noted the omission.

Critically, this Application seriously misstates the presence and importance of **Bell Canyon Creek, a precious habitat for steelhead trout, a federally protected species, with perennial flows provided by judicial process.**

The Water Availability Analysis performed by consult Richard C. Slate & Associates (RCS) misdescribed Bell Canyon Creek as follows[1].

[1] A comment that the Creek does not traverse the property is founded on the misstatement of the affected APNs discussed above. While it may be true that Bell Canyon Creek is merely adjacent to APN: 021-410-013, it clearly traverses APN 021-372-001. Note the latter has both a well and septic field.

> There are no mapped ephemeral creeks or drainages within the boundaries of the subject property. An unnamed “dashed” ephemeral creek, which drains southeast from Bell Canyon Reservoir, is shown on Figure 1 along the northern boundary. Such drainages would typically be shown as “dashed lines” on a USGS topographic map (denoting ephemeral status). small portion of the northeastern boundary of the property. This ephemeral creek drains toward the southeast out of the small valley and is tributary to the Napa River to the south. At the time of the June 2020 site visit, this creek was observed to be flowing.

In fact, Bell Canyon Creek has a long historical record of a native population of oncorhynchus mykiss, a species listed as threatened in both the U.S. Endangered Species Act and the California Endangered Species Act. O. mykiss are cold-water fish that have long been symbolic of clear, healthy mountain streams and lakes in North America. Rainbow trout and steelhead trout are genetically identical O. mykiss, but steelhead are anadromous, meaning they migrate as juveniles to the Pacific Ocean and return to freshwater to lay their eggs. The DFG has estimated that before the dam was built the spawning run of steelhead was approximately 100 fish. A DFG 1958 stream survey reported that steelhead were then common in the lower portion of the downstream reach. A DFG Warden testified in a hearing before the SWRCB in 1964 that in early 1959, while the Dam was still being constructed, he counted 50 to 60 fish in the downstream reach, and in early 1964 about 35 to 40 fish. He testified that Fish and Game regulations designated the downstream reach as a steelhead-spawning 1 stream, and it was even at that early date the creek was closed to steelhead fishing. He testified that the downstream reach had several deep-water pools that in their natural state that supported fingerlings over the summer.

Since the mid-twentieth century fish numerous fish surveys have found Bell Canyon Creek to be a critical and viable habitat for steelhead. See excerpts from the CEMAR survey attached.

However, by the turn of the century fish populations have been substantially depleted. In 2016 Water Audit California (Water Audit) determined that the cause was that the owner of the Bell Canyon Dam, the City of St. Helena, (CSH) was not in compliance with its obligation

under Fish and Game Code (FGC) section 5937. FGC § 5937 obliges all dam owners to bypass sufficient water to keep fish downstream in good condition.

Pursuant to a settlement agreement reached in 2018 between Water Audit and CSH, the city agreed to cooperatively develop a bypass plan, which was published in 2020. See Final Bypass Plan attached. Pursuant to the settlement and bypass plan, Bell Canyon Creek is now a perennial watercourse serving as a critical component of the revitalization of a key aquatic species.

This is not obscure information. A simple Google search for the California Bell Canyon Creek (to distinguish it from the Utah Bell Canyon Creek) delivers on the first page of responses the 2018 headline After Environmental Lawsuit St Helena Agrees to Bypass More Water Into Creek. The entirety of the litigation proceeding is public record.

The ecological importance of Bell Canyon Creek is not without acknowledgement in the Application. See Agenda Packet 228 Biological Resource Assessment Exhibit E. There is therefore a material difference of the statement of conditions stated within the application. Staff has neither disclosed, discussed nor attempted to reconcile the two positions taken.

We would wager that, absent this comment letter, the Planning Commission would not note the dramatically differing assessments, and go straight to staff conclusions.

Stream Setback Area #1

Stream Setback Area #1 is located along Crystal Springs Road (orange polygon on Attachment #1) and includes a 650' long segment of Bell Creek that runs along the property boundary, the riparian area of Bell Creek, as well as the plateau located above the creek. Bell Creek is a class 1 stream that supports fisheries, including Central California Coast steelhead (*Oncorhynchus mykiss)* as well as Sacramento suckers (*Catostomus occidentalis*), California Roach (*Hesperoleucus symmetricus*), threespine stickleback (*Gasterosteus aculeatus*), Sacramento pikeminnow (*Ptychocheilus grandis),* bluegill sunfish (*Lepomis macrochrius*), and sculpins *(Cottus sp.*). Even within this drought year, water is flowing with duckweed (*Lemna spp)* and water cress (*Nasturtium officinale*) noted within the water channel. Rocks have been stacked along the edge, above the creek, likely sourced from the flat area where the vineyard is now located. There are a few surviving overstory trees with the hardwoods sprouting. Most of the ground cover was burned with Himalayan berry quickly recolonizing the area.

Once again, the Application postings to the CEQA Clearinghouse have failed to disclose the entire project. See planning packet Attachment C, Initial Study/Negative Declaration. The MMRP posted on CEQA, which was the basis for CDFW's comment herein, is not the same

MMRP which is before the Planning Commission. The BIO-4 which was proposed by CDFW has been stricken and merged into BIO-1. The language is not the same as proposed by CDFW and is markedly different that that approved for the Inglenook project approved mere days ago.

BR-6	*Mitigation Measure BR-6. LSA Notification and Agreement.* Prior to commencement of Project construction, the Project shall provide a Project description and aerial based figure to CDFW indicating where Project impacts will occur in relation to streams and riparian habitat and obtain CDFW's written acceptance of the description and figure. If based on the description and figure impacts to stream or riparian habitat will occur, the Project shall notify CDFW of such impacts and obtain an LSA Agreement if required by CDFW prior to Project construction. The notification should be submitted online via the Environmental Permit Information Management System (EPIMS) at https://wildlife.ca.gov/Conservation/Environmental-Review/EPIMS. The Project shall comply with all measures of the LSA Agreement if issued.

As discussed above, BIO-2 has been altered to conceal culvert replacements that would require a stream alternation has been unilaterally altered to strike constraining language regarding erosion abatement, and also to replace the USACE/SWRCB/CDFW as the regulatory authority and to replace that trustee agency with the Napa Planning Division, an agency without expertise in or statutory authority over public trust resources.

Agenda Packet page 157 is the only site plan posted to the CEQA Clearinghouse. Site plans in the Water Availability Analysis and in GRAPHICS that clearly show the driveway planned, and its proximity to Bell Canyon Creek, but were not posted to the Clearinghouse, and therefore were not seen by CDFW. The result is a regulatory comment obtained by deception.

Note also that the federal agencies responsible for anadromous fish, National Marine Fisheries Service (NOAA Fisheries) and for federally protected resident species (U.S. Fish and Wildlife Service) were not given the opportunity to comment.

Water Audit adopts and incorporates here the comments of others regarding the legality, compliance and sufficiency of traffic and driveway disclosures and plans.

We additionally note that the plans are represented to be sufficient for the needs of a nominal “forty foot” motorhome, (average net length forty-five feet) while this site must be

served during construction and operations with standard semi-trailers with average net length of seventy-five feet. (Agenda Packet 7A, page C4 of 8) As there is no indication of heavy use by motorhomes, and an inferred use of tractor trailers, the use of a construction standard nearly half of what is appropriate is an attempt to build a sub-standard driveway.
There is so, so much more that can be written, and yet today we accord it more important to be timely than complete. Perhaps we are just weary of trying to communicate with those who will not listen.

We sincerely hope that the information provided is sufficient for the Commission recognize that this application is critically deficient, and that the law and public interest require, at the least, that the Applicant be sent away with the admonition to try better next time. Perhaps if a grossly deficient and deceptive application is rejected once, staff and the applicants will cease in their continuing efforts to "put another one over." More than likely, however, staff will be praised for another substandard performance. This is a friendship and faith-based process, wholly unfair to the people of Napa caused the ordinances and regulations to be passed and have faith that the laws are being equitably enforced.

Or perhaps something else will happen. The future is not ours to see. One way or another, with any kind of good fortune, Water Audit is out of the Whack a Mole game. We wish you well.

Respectfully

William McKinnon

William McKinnon
General Counsel
Water Audit California

PRELIMINARY OBJECTIONS

VIDA VALENTE WINERY

Water Audit takes exception to the notice of, documents provided, and findings presented for this hearing. That conduct has precluded proper and thoughtful review of the application, and it is uncertain if the notice is sufficient. The proposed project application omits critical information, necessary for an informed review and decision.

Through Government Code § 65800 et seq. the Legislature conveyed to the county the authority to adopt regulations and ordinances to promote the general welfare of the State's residents, while providing that the county's may exercise the maximum degree of control over zoning matters. Government Code § 65101 states in part: "The legislative body [i.e. the Board of Supervisors] may create one or more planning commissions each of which shall report directly to the legislative body."

The Napa County Planning Commission performs the function of a planning agency. Its five members are each appointed by the supervisor representing one of the counties' five districts for a term that expires one month after the appointing supervisor is no longer in office.

The County remains subordinate to the control and direction of the senior levels of government. Napa Ordinances Title 16 and Title 18 were required to conform the County to state law. The state endows the highest priority on fish and wildlife protection and conservation. "The Legislature finds and declares that the protection and conservation of the fish and wildlife resources of the state are of utmost public interest.

Fish and wildlife are the property of the people, and provide a major contribution to the property of the state …" (*Fish and Game Code* § 1600) This statement is one of the foundations of Water Audit's mission, both generally and herein. By simply stating that no impacts exist, Applicant has arbitrarily and wholly failed to discuss the substantial potential off-site impacts of the project.

The essential idea of the public trust doctrine is that the government holds and protects certain natural resources in trust for the public benefit. (See *Illinois Central Railroad v. Illinois* (1892) 146 U.S. 387, 452, 456; *National Audubon Society v. Superior Court* (1983) 33 Cal.3d 419, 441; *Berkeley v. Superior Court* (1980) 26 Cal.3d 515, 521.)

Public trust theory has its roots in the Roman and common law. (*United States v. 11.037 Acres of Land* (N.D. Cal. 1988) 685 F. Supp. 214, 215.) Its principles underlie the entirety of the State of California. Upon its admission to the United States in 1850, California received the title to its tidelands, submerged lands, and lands underlying inland navigable waters as trustee for the benefit of the public. (*People v. California Fish Co.* (*California Fish*) (1913) 166 Cal. 576, 584; *Carstens v. California Coastal Com.* (1986) 182 Cal.App.3d 277, 288.) The People of California did not surrender their public trust rights; the state holds land in its sovereign capacity in trust for public purposes. (*California Fish, Ibid.)*

The courts have ruled that the public trust doctrine requires the state to administer *as a trustee* all public trust resources for current and future generations, precluding the state from alienating those resources into private ownership and requiring the state to protect the long-term preservation of those resources for the public benefit. (*National Audubon, supra.* 33 Cal.3d 419, 440-441; *Surfrider Foundation v. Martins Beach 1, LLC* (2017) 14 Cal.App.5th 238, 249-251.)

The public trust fulfills the basic elements of a trust: intent, purpose, and subject matter. (*Estate of Gaines* (1940) 15 Cal.2d 255, 266.) It has both beneficiaries, the people of the state, and trustees, the agencies of the state entrusted with public trust duties.

The beneficiaries of the public trust are the people of California, and it is to them that the trustee owes fiduciary duties. As Napa County is a legal subdivision of the state, it must deal with the trust property for the beneficiary's benefit. No trustee can properly act for only some of the beneficiaries – the trustee must represent them all, taking into account any differing interests of the beneficiaries, or the trustee cannot properly represent any of them. (*Bowles v. Superior Court* (1955) 44 C2d 574.) This principle is in accord with the equal protection provisions of the Fourteenth Amendment to the US Constitution.

A public trust trustee "**may not approve of destructive activities without giving due regard to the preservation of those [public trust] resources.**" (*Center for Biological Diversity, Inc. v. FPL Group, Inc.* ("*Bio Diversity*") (2008) 166 Cal.App.4th 1349, 1370, fn. 19, 83 Cal.Rptr.3d 588.) [Emphasis added]

Common law imposes public trust considerations upon County's decisions and actions. (*Biological Diversity, supra.* 166 Cal.App.4th 1349; *Environmental Law Foundation v. State Water Resources Control Board* ("ELF") (Cal. Ct. App. 2018) 26 Cal.App.5th 844.) The courts have recognized the State's responsibility to protect public trust uses whenever feasible. (*See*, e.g., *National Audubon, supra.* 33 Cal.3d 419, 435; *California Trout, Inc. v. State Water Resources Control Bd.* (1989) 207 Cal.App.3d 585, 631; *California Trout, Inc. v. Superior Court* (1990) 218 Cal.App.3d 187, 289.) Napa County, under Public Resources Code, section 6009.1, has an affirmative duty to administer the natural resources held by public trust solely in the interest of the people of California.

The public trust doctrine requires the State (i.e. Napa County), as a trustee, to manage its public trust resources (including water) so as to derive the maximum benefit for its citizenry. Even if the water at issue has been put to beneficial use, it can be taken from one user in favor of another need or use. The public trust doctrine therefore means that no water rights in California are truly "vested" in the traditional sense of property rights.

Furthermore, there can be no vested rights in water use that harm the public trust. Regardless of the nature of the water right in question, no water user in the State "owns" any water. Instead, a right to water grants the holder thereof only the right to use water, a "usufructuary right". The owner of "legal title" to all water is the State in its capacity as a trustee for the benefit of the public. Both riparian and appropriative rights

Historical Distribution and Current Status of Steelhead *(Oncorhynchus mykiss*), Coho Salmon (*O. kisutch*), and Chinook Salmon (*O. tshawytscha*) in Streams of the San Francisco Estuary, California

October 2003

Robert A. Leidy

U. S. Environmental Protection Agency, Region 9

San Francisco, California 94105

Gordon S. Becker

Brett N. Harvey

Center for Ecosystem Management and Restoration

Oakland, Calfornia 94611

Bell Canyon Creek (Howell Creek)

Bell Canyon Creek drains approximately 14 square miles. It enters the Napa River about 2.5 miles north of St. Helena. The creek historically was a perennial steelhead stream that maintained flow in the headwaters even after numerous diversions caused the lower reach to become intermittent. Bell Canyon Reservoir, constructed in 1958, blocked steelhead passage to the upper, perennial reaches. The dam is located about two miles upstream from the Napa River confluence.

In February 1957, DFG visually surveyed portions of Bell Canyon Creek accessible by car, from the mouth upstream about 3.5 miles. No *O. mykiss* were observed, but residents stated that they had observed many small steelhead in the middle and lower sections of the creek in the early part of the year (Elwell 1957a).

In May 1958, DFG visually surveyed Bell Canyon Creek from the headwaters to a point approximately 3.5 miles upstream from the mouth. *Oncorhynchus mykiss* (40-50 mm) were common in the lower portion of the surveyed reach and appeared to be YOY (Elwell 1958i). A large population of *O. mykiss* (100-150 mm) that was deemed to be native stock was observed downstream of a natural falls about 5.5 miles upstream of the mouth (Elwell 1958i).

A May 1966 DFG field note identified *O. mykiss* (40-100 mm) at 5 per 30 meters in a flowing reach of Bell Canyon Creek downstream of Bell Canyon Reservoir. In another downstream reacch with water in the channel, *O. mykiss* were estimated at 100 per 30 meters. In the lower 30 meters of this reach, approximately 100 dead *O. mykiss* were found (Brackett and Duff 1966).

A 1967 DFG memorandum stated that 2.5 miles of Bell Canyon Creek were available to steelhead prior to construction of Bell Canyon Reservoir. The memo noted the obligation by DFG to substantiate their claim for a flow release of 5 cubic feet per second from the reservoir (Nokes 1967).

In June 1969, DFG visually surveyed two miles of Bell Canyon Creek from the mouth to the reservoir. *Oncorhynchus mykiss* (25-365 mm) were observed in intermittently flowing reaches at densities of 50-100 fish per 30 meters. Maximum density was noted immediately upstream of the confluence of the south fork (Howell Creek) (Thompson and Michaels 1969). In July 1969, DFG conducted an electrofishing survey in the same reach. Steelhead (40-150 mm FL) were estimated at 86 fish per 30 meters at a site one mile downstream of the Bell Canyon Dam, and 34 fish per 30 meters at the confluence with the south fork. The report conservatively estimated a steelhead standing crop of 4,100 fish (Anderson 1969a).

A 1970 DFG memorandum regarding St. Helena water rights states that Bell Canyon Creek at that time supported an average annual run of approximately 40 to 50 adult steelhead. The memo included an estimate of run size prior to construction of the reservoir of about 100 adult fish (Greenwald 1970).

In July 1975, DFG visually surveyed Bell Canyon Creek from the mouth to the reservoir. Intermittently flowing reaches had *O. mykiss* from 13-100 mm in length, at approximately 25

fish per 30 meters (Coleman and Van Zandt 1975). In April 1978, DFG investigated a fish kill downstream of the Bell Canyon Reservoir chlorination facility. Staff found 106 dead YOY steelhead (mean length 57 mm) and one larger individual (~200 mm) (Cox 1978).

In July 1981, DFG observed steelhead juveniles at the Silverado Trail and the Glen Mountain Lane crossings, but found the mile of channel below the reservoir to be dry (Harris and Ambrosins 1981a). In June 1987, DFG visually surveyed Bell Canyon Creek from the mouth to the reservoir. *Oncorhynchus mykiss* were observed averaging 50 mm in length. Natural propagation of *O. mykiss* was not considered "good" in the system (Montoya 1987a).

In August 1990, DFG electrofished Bell Canyon Creek sites to determine if the reach upstream of the reservoir contained *O. mykiss*. The survey area upstream from Angwin contained pools suitable as trout habitat, but no *O. mykiss* were observed (Gray 1990h).

Ecotrust and FONR carried out surveys in tributaries of the Napa River system in July and August 2001. Relative density of *O. mykiss* was noted between 1 and 3, with 3 indicating greater than one individual per square meter. Of four Bell Canyon Creek reaches, one was found to have *O. mykiss* at density level "1" (Ecotrust and FONR 2001).

Mill Creek

Mill Creek consists of about 3.2 miles of channel draining about 1.75 square miles. The creek enters the Napa River about three miles north of St. Helena.

In July 1965, DFG visually surveyed the length of Mill Creek between the mouth and Stone Hill Winery. The stream was dry at the mouth, but the flowing middle reach had 150-200 *O. mykiss* fingerlings per 30 meters (Culley and Fox 1965). Survey notes from May 1966 indicated that DFG found *O. mykiss* (25-175 mm) at densities of 25-50 fish per 30 meters throughout the length of Mill Creek (Brackett and Duff 1966).

In August 1978, DFG visually surveyed Mill Creek from its mouth to one mile downstream of the headwaters. *Oncorhynchus mykiss* averaging 50 mm in length were observed with estimated densities of 25-50 fish per 30 meters in the upper and lower surveyed reaches, and 5-10 fish per 30 meters in the middle reach (Lee and Namba 1978a).

Ecotrust and FONR carried out surveys in tributaries of the Napa River system in July and August 2001. Relative density of steelhead was noted between 1 and 3, with 3 indicating greater than one individual per square meter. Of nine Mill Creek reaches, three were found to have *O. mykiss* at density level "1," while two reaches had density level "2" and one reach had level "3" (Ecotrust and FONR 2001). Follow-up surveys were performed between June and September 2002. *Oncoryhynchus mykiss* were found in numerous Mill Creek reaches, including two reaches at density level “3” (Ecotrust and FONR 2002).

Ritchie Creek

Ritchie Creek drains an area of 2.8 square miles and consists of approximately 3.5 miles of channel. The creek joins the Napa River approximately three miles south of the city of Calistoga.

City of Saint Helena
Final Bypass Plan for Bell Canyon Reservoir,
Napa County, California

March 2019 Draft

Prepared on Behalf of

City of Saint Helena, 1480 Main Street, Saint Helena CA 94574

Prepared by:

Mike Podlech, Aquatic Ecologist
Matt O'Connor, O'Connor Environmental, Inc.

March 2, 2019

Purpose of this Memorandum

On August 22, 2017, the City of Saint Helena (City) and Water Audit entered into a Settlement Agreement regarding the operation of Bell Canyon Reservoir on Bell Creek, tributary to the Napa River in Napa County, California. Under the terms of the Agreement, the City committed to conducting hydrologic, geomorphic, and habitat quality assessments between October 2017 and August 2018 in support of a Final Bypass Plan (FBP) that provides recommendations for fisheries bypass flows to Bell Canyon Creek, including proportional contributions to mainstem Napa River flows. Per the Settlement, the FBP is to contain, at a minimum, (1) clearly articulated goals, management actions, and information needs, including long-term reservoir and bypass measuring and reporting system; (2) specific objectives; (3) flow prescriptions to serve as measurable objectives with specific quantitative attributes defined for magnitude, duration, seasonality, and frequency; and (4) adaptive management procedures utilizing associated ecosystem attributes and expected results from changed environmental flows to inform short-term monitoring and adaptive management needs. This memorandum presents the City's proposed FBP.

Background

Bell Canyon Reservoir impounds Bell Creek about 2.5 miles north of the City of St. Helena (City) and has been the City's major water supply source for over 50 years. The City maintains water rights Permits 9157 and 14810. Permit 9157 (Application 11816, filed April 8, 1947) indicates that Bell Canyon Reservoir, once constructed, would have a storage capacity of 1,800 acre-feet. This permit allows the City to divert and store 1,800 acre-feet, and directly divert 1.0 cubic foot per second (cfs) for immediate use between November 15 and April 15 of each year. The 1.0 cfs diverted for immediate use does not count against the 1,800 acre-foot storage limit. The following bypass flow requirements were added to Permits 9157 and 14810 in 1989 during permit renewal, and

are presently in effect (note that the current Permit conditions do not specific bypass flow requirements for the period of November 15 through November 30):

- December 1 – January 31: 4.0 cfs or total inflow, whichever is less;
- February 1 – February 29: 2.0 cfs or total inflow, whichever is less;
- March 1 – April 15: 1.0 cfs or total inflow, whichever is less;
- April 16 – November 14 (non-diversion season): bypass all inflows.

Permit 14810 (Application 20625, filed February 21, 1962) indicates that the storage in Bell Canyon Reservoir would be increased to 3,800 acre-feet, and allows the City to divert and store an additional 2,000 acre-feet between November 15 and April 15 of each year. The actual reservoir capacity at the spillway elevation of 422.0 feet has been estimated by James C. Hanson Consulting Engineer to be approximately 2,384 acre-feet. The dam height appears to be roughly 95 feet, corresponding to the height defined in Application 11816. The height given in Application 20625 is 105 feet. It appears there were plans to increase the height of the dam and increase storage to 3,800 acre-feet. This work has not yet occurred; however, a project was completed in the mid-1970's that raised the spillway elevation approximately 7 feet from 415 feet to 422 feet above sea level and increased the reservoir storage capacity to 2,384 acre-feet.

The City's current bypass flow requirements are directly tied to reservoir inflows rates. As described by PCI (2014), two standard methods for determining inflows into reservoirs are: 1) directly measuring the stream flow of the primary contributing tributary at the inlet to the reservoir, or 2) back-calculating inflows using a reservoir water balance method. The former method theoretically allows for a more responsive bypass release regimen as surface streamflow rates change. The latter method accounts for all inflows, including ephemeral or intermittent tributaries and subsurface inputs, but produces a much slower bypass release response to inflow changes. The City has been using a reservoir water balance approach. This approach is described in detail in PCI (2014), but essentially consists of calculating a daily average inflow rate with a formula that balances reservoir inputs and outputs. The daily inflow is calculated by summing the previous day's treatment plant influent, evaporation losses, and releases to lower Bell Creek, and then factoring these losses out of the change in reservoir volume. If there has been rainfall over the previous 24 hours, a contributing volume is calculated. The change in reservoir volume after all inputs and outputs are accounted for is considered to represent the average inflow over the preceding day. To normalize the inflow rate (as this methodology typically results in highly variable results from day to day, including periods of negative inflow), the inflow calculation is processed through a 7 day running average routine. This running average provides a nominal estimate of typical inflow rate to the reservoir to be considered in determining the bypass flow. The required bypass for the following 24 hour period is based on the calculated inflow plus predicted rainfall and the required minimum bypass discussed above. During the diversion period, if the inflows are above the minimum bypass requirement then the bypass rate is set capped at that bypass flow requirement. The City typically releases more than the minimum required bypass to ensure compliance.

Environmental Setting

The Napa River watershed covers an area of approximately 426 square miles and is contained on three sides by mountains. The Napa River runs through the center of the watershed on the valley floor and drains numerous tributaries on its 55-mile course from high in the headwaters of Mt. St. Helena in the Mayacamas Mountain range

to the San Pablo Bay. Along the way, it winds through varied landscapes of forested mountain slopes, vineyards, urban areas, open pasture, industrial zones, grasslands, and marshes (Koehler, 2002).

Over the past century, the Napa Valley has been transformed into a vineyard landscape with grape growing emerging as the primary use of land within the valley. The majority of vineyards have been planted along the Napa River and its tributaries, creating both direct and indirect impacts to the aquatic and riparian environments. Additionally, urban sprawl has brought roads and other changes into previously undisturbed areas of the watershed, further reducing the remaining areas of undisturbed open space (Koehler, 2002). Nevertheless, the Napa River watershed still supports a great diversity of fish and wildlife, including several species listed as threatened or endangered under the federal Endangered Species Act (ESA) and other special-status species.

Fisheries Resources

The Napa River supports a diverse fish population, the composition of which changes gradually from the lower estuarine reaches near the San Pablo Bay, through the broad and deep mid-valley reaches, to the smaller and often seasonal streams forming its northern headwater region. Leidy (2007) reports a total of 52 fish species known from the Napa River watershed, with 28 of those species considered native. At least five of these species no longer occur in Napa River, although there is some uncertainty whether three of these now-extirpated species were truly native to the watershed or had been introduced from elsewhere.

The Napa River is believed to have historically supported three salmonid species: steelhead (*Oncorhynchus mykiss*), Chinook salmon (*O. tshawytscha*), and coho salmon (*O. kisutch*)[1]. There has been a significant decline in the distribution and abundance of steelhead and coho salmon in the Napa River and its tributaries since the late 1940s. The Bureau of Sport Fisheries and Wildlife[2] (1968) estimated that the Napa River watershed once supported runs of 6,000–8,000 steelhead and 2,000–4,000 coho salmon, and that by the late 1960s, coho salmon had become extirpated from the watershed, and the steelhead run had been reduced to about 1,000 adults. Little is known about the historical abundance or distribution of Chinook salmon in tributaries to the San Francisco Estuary (Leidy, 2007). However, based on analysis of natural channel form, hydrology, and ecology, it is believed that the mainstem Napa River likely supported a large, sustainable population of Chinook salmon under historical conditions (Stillwater Sciences and Dietrich, 2002). Recent genetic analysis confirmed that most Chinook salmon currently spawning in the Napa River are descendants of Central Valley fall/late-fall populations, although at least one instance of successful spawning by Klamath River adults was documented (Garza and Crandall, 2013).

Due to the fact that coho salmon are now assumed extirpated from the watershed, and Chinook salmon typically occupy larger, deeper channel habitats than those found in Bell Creek, steelhead have been selected as the target species for the purposes of developing this FBP for Bell Canyon Reservoir. Stray Central Valley Chinook salmon are considered indirectly in the context of Bell Canyon Reservoir's potential effects on the mainstem Napa River where Chinook salmon are expected to spawn and rear prior to the spring emigration of juveniles. As described above, a number of other native, non-salmonid fish species are present in the Napa River watershed and Bell Creek. However, steelhead are typically thought of as a keystone species, and ecological management practices aimed at benefitting steelhead are generally accepted to provide suitable conditions for other native fish species that have coevolved with steelhead. The lifecycle and habitat requirements of Napa River steelhead, based on a thorough description provided by Stillwater Sciences and Dietrich (2002) are described in further detail below.

---

1 There is some uncertainty as to whether coho salmon were historically native to the Napa River watershed (e.g., Leidy, 2007).
2 Now known as the U.S. Fish and Wildlife Service (USFWS).

Steelhead

Steelhead is the name commonly used for the anadromous (i.e., ocean-migrating) life history form of rainbow trout (*O. mykiss*). Steelhead exhibit highly variable life history patterns throughout their range. The relationship between anadromous and resident life history forms of *O. mykiss* is not well understood, but the two forms are capable of interbreeding and, under some conditions, either life history form can produce offspring that exhibit the alternate form (i.e., resident rainbow trout can produce anadromous progeny and vice versa) (e.g., Courter et al. 2013).

Status

Steelhead found in the Napa River watershed belong to the Central California Coast (CCC) Distinct Population Segment (DPS) (NMFS, 2006). This DPS extends from the Russian River to Aptos Creek, and includes tributaries to San Francisco and San Pablo bays eastward to the Napa River, excluding the Sacramento-San Joaquin River basin. Winter runs of steelhead occur in the Napa River mainstem and tributaries. Critical habitat for CCC steelhead in the Napa River has been designated to include the entire mainstem river, as well as many of its tributaries, including Bell Creek from its confluence with the Napa River to the base of Bell Canyon Reservoir dam (NMFS, 2005).

Information on abundance and productivity trends for the naturally spawning component of the CCC steelhead DPS is limited (Williams *et al.*, 2016). However, estimates of steelhead statewide show a reduction in numbers from 603,000 in the early 1960s to 240-275,000 in the 1980s (McEwan and Jackson, 1996), indicating a potential decline of at least 54%. Within the CCC steelhead DPS, estimates of run sizes in the largest river system, the Russian River, have gone from 65,000 in the 1960s to 1,750-7,000 in the 1990s (Good *et al.*, 2005), indicating a potential decline of at least 89%. The Napa River steelhead population is currently estimated to consist of 200-1,000 adult fish based on surveys throughout the watershed (Koehler, 2002). A recent National Marine Fisheries Service (NMFS) population viability assessment (Williams *et al.*, 2016) notes that the continued overall lack of population data for the Napa River watershed and other watersheds of the San Francisco Bay diversity stratum of CCC steelhead do not allow for conclusions to be drawn about current population status, trends, or viability.

Life History and Habitat Requirements

Steelhead return to spawn in their natal stream, usually in their fourth or fifth year of life, with males typically returning to freshwater earlier than females (Shapovalov and Taft 1954). A small percentage of steelhead may stray into streams other than those in which they were born. Winter-run steelhead generally enter spawning streams from fall through spring as sexually mature adults, and spawn a few months later in late winter or spring (Meehan and Bjornn, 1991). Barriers to adult migration passage have played a significant role in the decline of salmonid species such as steelhead by preventing access to upstream habitat. Dams and perched culverts can completely block adult steelhead passage, while features such as undersized culverts may impede passage due to excessive water velocities. Shallow riffles and wide concrete-lined channels may interfere with adult passage due to insufficient water depths to allow fish to remain sufficiently submerged.

Spawning occurs primarily from January through March, but may begin as early as late December and may extend into April. Female steelhead construct redds (nests) in suitable gravels. The amount of suitable spawning habitat within a stream can directly determine the ability of that stream to support large populations of steelhead. Adult steelhead need access to spawning gravel in areas free of heavy sedimentation with adequate flow and cool,

clear water. Preferred gravel substrate is in the range of 0.25 to 4 inches in diameter (Bjornn and Reiser 1991). Preferred spawning sites are located in pool-tail/riffle head areas where flow accelerates out of the pool into the higher gradient section below.

Steelhead eggs incubate within the gravel for 3-14 weeks, depending on water temperatures (Shapovalov and Taft, 1954). Excessive amounts of fine sediment within a stream may fill interstitial spaces within the spawning gravels beds and can smother eggs. After hatching, alevins remain in the gravel for an additional 2-5 weeks while absorbing their yolk sacs, and then emerge in spring or early summer.

After emergence, steelhead fry move to shallow-water, low-velocity habitats, such as stream margins and low-gradient riffles, and forage in open areas lacking instream cover (Moyle, 2002). As fry grow and improve their swimming abilities in late summer and fall, they increasingly use areas with cover and show a preference for higher velocity, deeper mid-channel areas near the thalweg (the deepest part of the channel) (Moyle, 2002). After their initial growth period, juvenile steelhead begin to occupy a wide range of habitats, preferring deep pools as well as higher velocity rapid and cascade habitats (Bisson *et al.*, 1988). During the winter period of inactivity, steelhead prefer low-velocity pool habitats with large rocky substrate or woody debris for cover.

Juvenile steelhead emigrate to the ocean as smolts from mid-March through early June. Emigration appears to be more closely associated with size than age, with 6–8 inches (15–20 cm) being most common for downstream migrants. Steelhead have variable life histories and may migrate downstream to estuaries as age 0+ juveniles or may rear in streams for up to four years before outmigrating to the estuary and ocean (Shapovalov and Taft, 1954). Steelhead migrating downstream as juveniles may rear for one to six months in the estuary before entering the ocean.

Water temperature is an important factor affecting steelhead incubation and juvenile rearing success. Temperature directly affects survival, growth rates, and smoltification. Temperature also indirectly affects disease vulnerability to disease and predation. In addition to the effects of temperature on incubation and smoltification time and success, increased temperature can increase susceptibility to pathogens and disease. In their detailed and widely-cited summary of salmonid habitat requirements, Bjornn and Reiser (1991) report preferred juvenile steelhead water temperature ranges as 10-13º C. Recent research specific to central California salmonid strains, however, suggest that temperature tolerances of steelhead in this region may be higher than races in the Pacific Northwest. However, an increase in water temperature has a positive effect on fish metabolic rates, and therefore water temperature can indirectly influence habitat selection of juvenile salmonids (Smith and Li, 1983). If available, juvenile steelhead will use riffles and other fast water habitats where food resources, in the form of drifting invertebrates, are more abundant. In order to cope with increased metabolic demands associated with rearing in warmer stream environments, juvenile steelhead utilize specific microhabitats where they can maximize food intake while minimizing energetic costs associated with feeding. Smith and Li (1983) found that as water temperatures increased, juvenile steelhead increasingly used focal points with greater water velocities in order to obtain suitable amounts of food to meet metabolic costs. Where food is abundant, high growth rates can be achieved in warmer water (Myrick and Cech, 2005) and steelhead can reach smolt size in one year (Smith and Li, 1983; Hayes *et al.*, 2008). However, in situations where food is limited and water temperatures are high, growth is reduced (McCarthy *et al.*, 2009). Rearing steelhead juveniles are generally tolerant of a maximum temperature of about 24°C (Sullivan et al., 2000), and long-term exposure to temperatures continuously above 24°C is usually lethal (Moyle, 2002).

Historic and Current Conditions

Napa River Watershed

In an extensive review and analysis of the historic ecological conditions of the Napa Valley, Grossinger (2012) provides a broad overview of the natural conditions of the Napa River watershed prior to the extensive development and alterations that have occurred over the past two centuries. Stillwater Sciences and Dietrich (2002) provide a review of historic conditions and current limiting factors as they relate specifically to fisheries resources. This analysis included an evaluation of aerial photography from 1940 and 1998 to identify physical changes that have occurred in three channel reaches of the mainstem Napa River, including one reach in the vicinity of the Bell Creek confluence. The conclusions of the Stillwater Sciences and Dietrich (2002) analysis, which are largely consistent with the broader overview presented in Grossinger (2012), are summarized below.

Prior to major anthropogenic disturbances in the basin, the Napa River presumably had numerous side channels that provided backwater rearing habitat for juvenile salmonids. The mainstem channel was likely connected to its floodplain in most locations, with the floodplain inundated during several storms per year. In contrast, 1998 aerial photographs depict a simplified river floodplain system in which the channel has narrowed, incised, and largely abandoned its former floodplain, resulting in a loss of backwater rearing habitat. Review of channel cross-section records, published reports, and field observations indicate that the river has incised at least 4 - 6 ft on average from the mouth of the river to a point upstream of Calistoga, and is currently in the process of active channel incision upstream of Calistoga (Stillwater Sciences and Dietrich, 2002). The abandonment of the floodplain and the present-day channel entrenchment in the Napa River watershed are most likely caused by anthropogenic impacts, such as draining and diking of the valley floor, filling of side channels to facilitate development of the floodplain, mainstem channel straightening, mainstem bank stabilization, levee construction, gravel dredging downstream of the City of Napa, gravel bar skimming, loss of bedload supply due to dam construction, and large woody debris (LWD) removal on the mainstem (Stillwater Sciences and Dietrich, 2002).

These types of alterations of the mainstem Napa River appear to have generally occurred throughout the valley floor, from Calistoga downstream to the City of Napa, and have affected the quality and abundance of suitable aquatic and riparian habitat for native species. The natural bar-pool morphology evident in the 1940s aerial photos and expected in a wandering river such as the Napa River, with its alternating sequence of pools and riffles, has been converted in many reaches into a series of long run-pools (i.e., long pools that are shallow relative to their length) separated by very small bars. These long run-pools create lake-like habitat for non-native predatory fish, increasing the exposure of native salmonids to predation during rearing and outmigration. Channel incision may have increased bed mobilization, which in turn may have increased frequency and intensity of scour of salmonid redds during the winter months. Floodplain abandonment has resulted in the loss of side channel, backwater, and slough habitats that would have provided high quality rearing habitat. Throughout most of its length, the mainstem Napa River now supports only a narrow band of riparian vegetation.

Furthermore, Stillwater Sciences and Dietrich (2002) suggest that prior to European-American settlement, the wooded tributaries of the Napa River likely contained relatively frequent log jams that created deep pools and locally reduced transport capacity, inducing deposition of spawning-size gravel in patches. Based on observations gathered during reconnaissance surveys and other records, Stillwater Sciences and Dietrich (2002) speculate that there were likely abundant redwood and mixed evergreen forests along many of the tributaries within the Napa River watershed, providing long-lasting woody debris to stream channels. Currently, the frequency of woody debris is extremely low in channels throughout the watershed. These levels are lower than those common in many

similar systems in the region, and are probably indicative of woody debris clearing. The clearing of LWD appears to have altered the morphology and local hydraulics of many tributary streams. Removal of woody debris, logging (and loss of wood recruitment), construction of extensive streamside road networks, construction of dams, and other land use practices appear to have resulted in a simplified channel morphology (including reduction in the size and frequency of spawning gravel patches), locally higher flow velocities, some channel incision, a loss of deep pools, and some presumed local coarsening of the channel bed (Stillwater Sciences and Dietrich, 2002).

Despite long-term habitat degradation and loss, however, the Napa River watershed still contains extensive areas of relatively high-quality steelhead habitat. In fact, it has been identified as one of the most important anchor watersheds within the San Francisco Estuary for the protection and recovery of regional steelhead populations (Becker *et al.*, 2007).

Bell Creek Watershed

The central Napa River watershed, as defined by the Napa County Resource Conservation District (NCRCD) in its Central Napa River Watershed Project (NCRCD, 2005), includes the watercourses of the Napa River basin from the Bell Creek confluence in the north downstream to the confluence of Soda Creek, and covers an area of approximately 172 square miles. Tributaries of the Napa River watershed are generally steep, coarse gravel- or cobble-bedded streams with small or non-existent floodplains, few deep pools suitable for steelhead rearing, and limited spawning gravel (Stillwater Sciences and Dietrich, 2002). Based on a 2004 assessment of current salmonid habitat conditions within the mainstem central Napa River and nine of its tributaries, NCRCD (2005) found an overall lack of suitable summer rearing habitat for juvenile salmonids, due primarily to lack of perennial stream flow and poor water quality conditions during critical warm months, but also noted that several reaches with high quality salmonid habitat were identified in the following tributaries: York Creek, Wing Canyon Creek, and "relatively short stretches of Bell Creek" and Soda Creek. The mainstem central Napa River offers minimal spawning and rearing habitat for steelhead as indicated by the low abundances of juveniles observed (NCRCD, 2005). Detailed results of the 2004 habitat assessment of Bell Creek are summarized and discussed in the *Assessment Results* section below.

Periodic stream and fish surveys of the Bell Creek have been conducted by the California Department of Fish and Game (DFG; now the California Department of Fish and Wildlife) and others over the past half century, and reports of these surveys have been summarized by NCRCD (2005). While the referenced reports provide insights into past fish habitat value and utilization downstream of the dam, definitive conclusions regarding fish populations cannot be drawn from the largely qualitative (i.e., streamside observations) information provided in these field reports. For example, the oldest (1957) of these reports predates the construction of Bell Canyon Reservoir and notes that no steelhead were observed along 3.5 miles of the Bell Canyon Creek. The following summary of historic DFG field reports is taken from NCRCD (2005)[3].

1. In February 1957, DFG visually surveyed portions of Bell Canyon Creek accessible by car, from the mouth upstream about 3.5 miles. No *O. mykiss* were observed, but residents stated that they had observed many small steelhead in the middle and lower sections of the creek in the early part of the year.

2. In May 1958, DFG visually surveyed Bell Canyon Creek from the headwaters to a point approximately 3.5 miles upstream from the mouth. *O. mykiss* (40-50 mm) were common in the lower portion of the

3 Refer to NCRCD (2005) for DFG field report citations.

surveyed reach and appeared to be young-of-the-year fish. A large population of *O. mykiss* (100-150 mm) that was deemed to be native stock was observed downstream of a natural falls about 5.5 miles upstream of the mouth.

3. A May 1966 DFG field note identified *O. mykiss* (40-100 mm) at 5 per 30 meters in a flowing reach of Bell Canyon Creek downstream of Bell Canyon Reservoir. In another downstream reach with water in the channel, *O. mykiss* were estimated at 100 per 30 meters. In the lower 30 meters of this reach, approximately 100 dead *O. mykiss* were found.

4. A 1967 DFG memorandum stated that 2.5 miles of Bell Canyon Creek were available to steelhead prior to construction of Bell Canyon Reservoir. The memo noted the obligation by DFG to substantiate their claim for a flow release of 5 cubic feet per second from the reservoir.

5. In April 1978, DFG investigated a fish kill downstream of the Bell Canyon Reservoir chlorination facility. Staff found 106 dead young-of-the-year steelhead (mean length 57 mm) and one larger individual (~200 mm).

6. In July 1981, DFG observed steelhead juveniles at the Silverado Trail and the Glen Mountain Lane crossings, but found the mile of channel below the reservoir to be dry.

7. In June 1987, DFG visually surveyed Bell Canyon Creek from the mouth to the reservoir. *Oncorhynchus mykiss* were observed averaging 50 mm in length. Natural propagation of *O. mykiss* was not considered "good" in the system.

8. In August 1990, DFG electrofished Bell Canyon Creek sites to determine if the reach upstream of the reservoir contained *O. mykiss*. The survey area upstream from Angwin contained pools suitable as trout habitat, but no *O. mykiss* were observed.

9. Ecotrust and FONR (2001) conducted snorkel surveys in tributaries of the Napa River system in July and August 2001. Relative density of *O. mykiss* was noted between 1 and 3, with 3 indicating greater than one individual per square meter (~10 square feet). Of four Bell Canyon Creek reaches, one was found to have *O. mykiss* at density level "1", representative of a population density of 0.5 steelhead or less per square meter (Ecotrust and FONR 2001).

10. As part of its 2004 assessment of fisheries habitat conditions of the central Napa River watershed, NCRCD (2005) conducted snorkel surveys in Bell Creek, Canon Creek, Bale Slough, York Creek, Rector Creek, Soda Creek, and the mainstem Napa River. These surveys revealed low (less than 0.25 steelhead/square meter) to moderate (0.25-0.50 steelhead/square meter) juvenile steelhead densities in Bell Creek and most of the other sampled streams. Based on these results, NCRCD (2005) concluded that, consistent with previous sampling efforts (Ecotrust & FONR, 2001), most suitable rearing habitat in the central Napa River basin is "well-seeded" with juvenile steelhead.

As noted above, the qualitative nature of most of these reports does not allow for a meaningful analysis of steelhead population trends over the past 60 years. However, the two most recent surveys by Ecotrust and FONR (2001) and NCRCD (2005), which are the only ones that were conducted in accordance with a standard fish

survey protocol (snorkeling), suggest that the current status of the Bell Creek steelhead population is consistent with that found in various other Napa River tributary streams.

Summary

Steelhead populations throughout the Napa River watershed have declined dramatically over the past century, as they have throughout the range of the CCC DPS. Due to the largely reconnaissance-level nature of periodic fisheries surveys conducted in the Bell Creek watershed since the construction of Bell Canyon Reservoir, no clear population trends can be discerned. However, the construction and operation of Bell Canyon Reservoir, as is the case for any onstream reservoir, likely contributed to habitat degradation to some degree, as have other factors such as bank armoring, floodplain conversion, and riparian clearing. Similar practices have occurred throughout the natural range of steelhead and other species. It is therefore exceedingly difficult to isolate the effects any one disturbance factor, such as an onstream dam, may have had on fisheries population trends. What is clear, however, is that the remediation of all of these interrelated disturbances will be necessary if steelhead and other listed salmonid species are to be recovered. To that end, the City proposes to modify its permitted reservoir operations in an effort to minimize its contribution to the adverse conditions faced by the remaining steelhead population. However, in the absence of concomitant restoration efforts aimed at remediating other factors limiting fisheries populations, the ecological benefits of the proposed reservoir reoperation may remain unrealized.

Bypass Plan Development and Recommendations

The construction and operation of onstream dams may result in a number of adverse effects to native fishes and their habitat. In addition to preventing fish passage to upstream spawning and rearing habitats for anadromous salmonids, onstream dams may alter the natural hydrology and geomorphology of downstream channel reaches, intercept and retain coarse sediment transport that would otherwise replenish downstream spawning gravels, and trap large wood that would otherwise provide downstream habitat structure. They may also create slow-moving, lake-like habitats that can favor non-native species that may be washed over the dam during reservoir spills and either prey on anadromous salmonids or compete for food and shelter in downstream habitats. While these potential adverse effects are common to most dams, it is important to recognize the varying degree to which different dams affect downstream resources. Moreover, unrelated downstream land use practices such as channelization or removal of riparian vegetation often exacerbate the effects of onstream dams.

In California, operators of dams are required to comply with Fish and Game Code Section 5937, which states that "the owner of any dam shall allow sufficient water at all times to pass through a fishway, or in the absence of a fishway, allow sufficient water to pass over, around or through the dam, to keep in good condition any fish that may be planted or exist below the dam." Fish and Game Code Section 5937 does not define the term "good condition", but during a 1996 a court case involving in-stream flows in Putah Creek, Solano and Yolo counties, below Monticello Dam, fisheries experts developed a definition that encompasses three levels of fish health: individual level, population level, and community level (Moyle *et al*., 1998):

> *Individual Level:* Most fish in a healthy stream environment should have a robust body conformation; should be relatively free of diseases, parasites, and lesions; should have reasonable growth rates for the region; and should respond in an appropriate manner to stimuli.

Population Level: Extensive habitat should be available for all life history stages. Furthermore, all life history stages and their required habitat should have a broad enough distribution within the creek to sustain the species indefinitely (barring stream-long catastrophes).

Community Level: A fish community in good health is one that (1) is dominated by co-evolved species, (2) has a predictable structure as indicated by limited niche overlap among species and by multiple trophic levels, (3) is resilient in recovering from extreme events, (4) is persistent in species membership through time, and (5) is replicated geographically.

While this definition provides a relatively clear indication of the characteristics that must be evident in individual fish, populations, and communities to be considered in "good condition", the data required to make these determinations typically require extensive studies. Since adequate long-term fisheries data is not available for most watersheds[4], including Bell Creek, fisheries resource managers typically rely on habitat characteristics as a surrogate for determining whether fish are being maintained in "good condition." Under this approach, it is generally assumed that if habitat characteristics, including streamflow levels, are consistent with the current understanding of the habitat requirements of fish, then fish inhabiting these habitats should be in "good condition". Conversely, aquatic habitat that is severely deteriorated would not be expected to maintain fish in "good condition".

Grantham and Moyle (2014) present an evaluation approach to identify dams in California where flow modifications and/or other management actions may be warranted to comply with Section 5937. The approach follows a tiered framework that focuses on the inventory, characterization, and selection of dams based on evidence of flow regime alteration and downstream fish community impairment. Following an initial evaluation of more than 1,400 dams in California, 753 dams, including Bell Canyon Reservoir, were selected for further assessment. Of the 753 dams evaluated, 220 were identified as high-priority sites to further assess the condition of fish based on evidence of hydrologic and biological impairment (Grantham and Moyle, 2014). Although evaluation results for individual dams are not provided in the technical report, Bell Canyon Reservoir was not identified as a high priority site by Grantham and Moyle (2014).

As described above, the current understanding of both existing and historic fisheries and habitat conditions in Bell Creek is based on a limited number of largely reconnaissance-level assessments, and one detailed habitat inventory (NCRCD, 2005) that provides a useful overview of relatively current habitat conditions, but does not provide a quantitative analysis of habitat-flow relationships that would allow for a determination of instream flow needs for steelhead in Bell Creek. Similarly, conditions in the City's 1989 Permit renewal specified that DFG shall conduct studies on Bell Creek to evaluate the effectiveness of the recommended and subsequently permitted bypass flow requirements, but to the best of our knowledge, such studies were never conducted. The following section describes our approach to evaluating habitat conditions, including geomorphic characteristics, and developing instream flow recommendations for maintaining fish in good condition below Bell Canyon Reservoir.

Assessment Approach

A habitat assessment of Bell Creek was conducted in 2018 to update data previously collected by NCRCD (2005) regarding baseline habitat conditions. The results of the habitat assessment were used to establish existing fish habitat quality of Bell Creek. The habitat assessment was supplemented with a geomorphic survey to assess fluvial processes and the effects of flow regulation on fisheries habitat. The hydrologic effects of Bell Canyon

4 Long-term fisheries data *was* available during the Putah Creek trial.

Reservoir on Bell Creek were analyzed through an unimpaired reservoir inflow simulation and a frequency analysis of channel-forming flows. Habitat availability as a function of streamflow was evaluated through habitat quantification and modelling at index site representative of stream conditions under varying flow regimes.

The results of these assessments are analyzed in the context of the potential roles the construction and operation of Bell Canyon Reservoir and other unrelated factors may have played in the current state and trajectory of geomorphic, hydrologic, and biologic processes of Bell Creek, and provide the basis for the recommended bypass flow schedule.

Habitat Quality

As part of its 2004 evaluation of salmonid habitat conditions in the central Napa River watershed, NCRCD (2005) conducted a habitat inventory of the Bell Creek watershed in accordance with methodologies presented in the *California Salmonid Stream Habitat Restoration Manual* (Flosi *et al.*, 1998). In support of the preparation of this FBP, a similar habitat assessment of Bell Creek was conducted in 2018. The assessment utilized the same *Restoration Manual* protocol, but focused on broad habitat types (i.e., Level II habitat classifications) and metrics.

Habitat inventories such as those conducted per *Restoration Manual* methods provide a valuable overview of general habitat characteristics of a stream. However, due to the largely subjective quantification methodology and averaging of metrics, habitat inventories should not be used as a tool for identifying fine-scaled changes in habitat conditions over time. As such, our assessment of current habitat conditions in Bell Creek summarizes the NCRCD (2005) results and, were relevant, provides a qualitative comparison to our 2018 findings to identify broad habitat quality conditions that may have changed during the past 14 years.

The assessment was conducted on February 5 and 6, 2018, while the City was bypassing approximately 1 cfs, and on September 19, 2018 during a bypass release of approximately 0.4 cfs. A total of approximately 7,200 ft (1.4 miles) of channel were assessed. Several short reaches were not surveyed due to the presence of dense Himalayan blackberry (*Rubus armeniacus*) thickets and/or deep pool habitat associated with beaver dams (*Castor canadensis*).

In addition to the field assessment of physical habitat conditions, a preliminary evaluation of potential water temperature effects of Bell Canyon Reservoir operations was conducted in summer 2018. A temperature logger was installed in Bell Creek at the inflow gaging site upstream of the reservoir. Temperature data were recorded June 1, 2018 through September 13, 2018 at 15-minute intervals. The data were compared to treatment plant influent water temperatures measured by the City once a day (typically 7:00-7:30 AM). Treatment plant influent water originates from a t-junction at the outlet valve at the base of the reservoir dam. As such, influent water temperatures are assumed be representative of bypass release water temperatures at the time of measurement. However, the limited frequency of influent water temperature measurement limits the utility of the data as diurnal fluctuations cannot be evaluated and even daily means are not available, but a comparison of general trends in inflow and outflow temperatures nevertheless provides a coarse assessment of the effects of the reservoir on stream temperatures.

Geomorphic Channel Conditions

The assessment of fish habitat geomorphology utilized field survey data and field observations collected concurrent with the habitat assessments. Data from the Napa County LiDAR Digital Elevation Model (DEM) was also used.

The geomorphic assessment utilized an approach similar to that used by O'Connor Environmental. Inc. (OEI) to characterize habitat geomorphology in three other Napa River tributaries analyzed for the San Francisco Estuary Institute: Soda Creek (Pearce et al., 2002), Sulfur Creek (Pearce et al. 2003a), and Carneros Creek (Pearce et al., 2003b). These methods were adapted from Washington Department of Natural Resources watershed analysis procedures (https://www.dnr.wa.gov/watershed-analysis) with which Dr. O'Connor has intensive familiarity. In those studies of Napa River tributaries, a formal and detailed data collection protocol was employed to quantitatively characterize habitat geomorphology by sampling ten segments of each stream of a length equivalent to 25x the bankfull channel width. Detailed observations of channel geometry, streambed sediment size, sediment storage in bars, pool types and sizes, streambank conditions and erosion, and large woody debris were collected systematically. The data were summarized and interpreted with respect to fish habitat suitability metrics.

In Bell Creek, we observed similar features and collected similar data, but the intensity of data collection was much reduced to allow for a survey of the entire 1.6-mile reach of Bell Creek below Bell Canyon Reservoir. The geomorphic data and assessment are both quantitative and semi-quantitative and intended to evaluate the general status of geomorphic processes and conditions contributing to the formation and maintenance of fish habitat and the degree to which processes may be impaired by reservoir effects on peak flow and sediment supply.

Habitat-Flow Relationship

Instream flow needs recommendations for this FBP were developed through the application of hydrologic field assessments and modelling. To identify streamflow levels necessary for unimpeded passage of adult and juvenile (smolt) steelhead in Bell Creek, a critical riffle analysis based on the Thompson (1972) methodology was used to estimate the minimum river flow necessary for upstream adult and smolt migration passage. The methodology involves identifying the critical (i.e., shallowest) riffle(s) within a stream reach and measuring water depths across riffle transects under a range of stream discharges. In order for a riffle to be considered "passable" under the Thompson (1972) method, at least 25% of the total riffle width and a continuous portion of at least 10% of the riffle width must meet species- and life-stage specific water depth criteria. The Thompson (1972) depth criterion for adult steelhead is 0.6 ft. Although Thompson (1972) does not specify a depth criterion for smolts, the methodology applies a 0.4 ft criterion for "trout", presumably referring to a variety of resident trout species such as resident rainbow trout (*O. mykiss*), the smaller and non-anadromous life history expression of steelhead. Although conservative, this criterion has been widely applied to passage evaluations of yearling and older juvenile steelhead, including smolts.

Critical riffles representative of the shallowest fish passage locations were identified during the habitat and geomorphic surveys of Bell Creek. Two sites were selected for the analysis: the upper (Terroir) evaluation site, located approximately one stream-miles above the confluence of Bell Creek and the Napa River, and the lower (Vineyard) evaluation site approximately 0.75 stream-miles above the Napa River confluence (**Figure 1**).

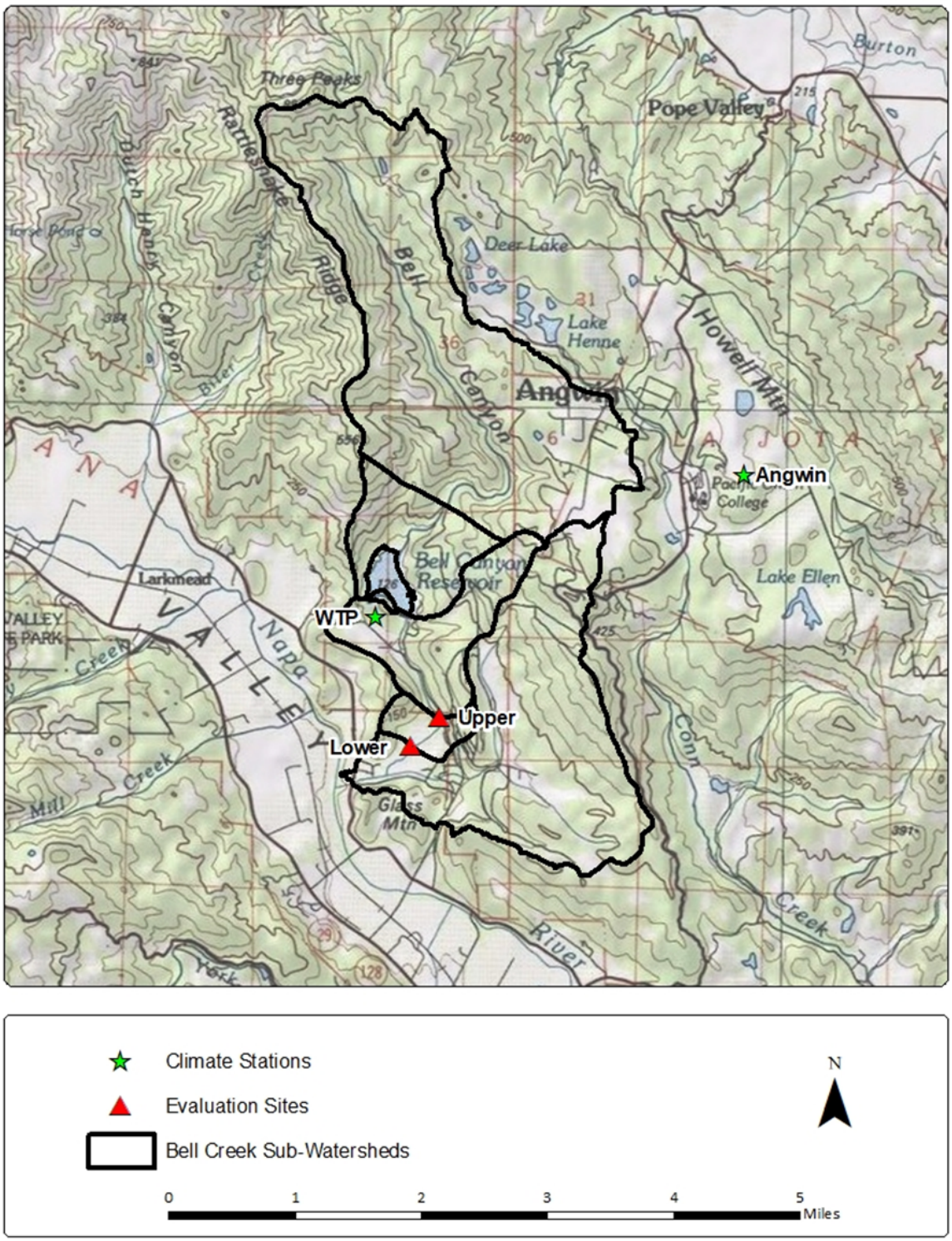


Figure 1. Bell Creek watershed, including evaluation sites, and climate stations

The upper (Terroir) evaluation site contained two separate locations that may restrict passage and depth transects at both were considered for a total of three transects (two at Terroir and one at Vineyard). The dominant substrate at all sites was a combination of cobbles and small boulders. Each site was topographically surveyed using a Topcon GTS-605 total station and survey data were used to create a DEM for hydraulic modeling and critical riffle analyses. The channel length for hydraulic model domains were 156 ft and 132 ft for the Terroir site and the Vineyard site, respectively. During the total station survey, a 2-ft x 2-ft grid was established within the shallowest portions of the riffles. The length of channel surveyed on this grid was 30 ft at the Terroir Riffle and 32 ft at the Vineyard Riffle; wetted widths were about 20 ft. Subsequent depth observations measured on this grid at different rates of stream discharge were collected with the aid of a flexible measuring tape strung between fixed monuments that served as longitudinal location reference. Horizontal positions for observations were determined using a survey rod to scale the appropriate perpendicular distance from the reference tape. In this fashion, water depth was repeatedly measured on a fixed sample grid at different stream discharges.

At the onset of the habitat-flow relationship analyses in February 2018, it was hoped that several flows over a wide range of discharge, including reservoir spill events, would be observed. However, no significant spill events occurred between February and May 2018. Streamflows in the range of about 5-11 cfs were observed in late-March and early-April. In order that data could be obtained over a sufficient range of flows at both sampling sites, controlled reservoir releases were conducted July 5 and 6, 2018. The maximum controlled release possible from the reservoir is about 12 cfs. Controlled releases were about 12.1, 9.1 and 2.2 cfs. The corresponding flows measured at the critical riffle sites were about 9, 5 and 2 cfs, respectively. Baseflow at the critical riffle sites before and after the controlled release was approximately 0.5 cfs.

To evaluate flows greater than those observed during runoff events and controlled releases, and to provide additional perspective on the empirical data, a two-dimensional (2-D) hydraulic model using the MIKE21 (DHI) code was developed for each stream reach containing the Terroir and Vineyard riffles (**Figure 2**). Topographic survey data were used to create the DEM for model bathymetry. Roughness values were assigned using a combination of roughness values from scientific literature and experience from other similar projects. The hydraulic model was calibrated by comparing field observed depths across each critical riffle transect with modeled depths. Discharges used for calibration include those measured at the time of the depth measurements (e.g., **Figure 3**). Calibration focused on the higher end of field measured values and included adjustments to roughness values. The calibrated model was used to simulate discharges approaching or just exceeding the maximum possible controlled release from Bell Canyon Reservoir. Discharges evaluated using the 2-D model included 10, 11, 12 and 13 cfs at the Vineyard Riffle and 11, 12, and 13 cfs at the Terroir Riffle.

Separate cumulative frequency tables of measured channel depths using 0.01 ft vertical intervals were developed for each transect and flow combination. The greatest depth corresponding to a cumulative transect width of 75% or less of the total width was used to determine flow depths meeting the 25% contiguous width criterion. The 10% contiguous width threshold was identified using the raw transect data. Based on critical riffle depth data over the range of measured and simulated stream discharges, the discharges meeting the juvenile and adult steelhead depth criteria were calculated using linear interpolation. Linear interpolation was selected over polynomial or exponential interpolation because the data points closely follow a linear relation and because higher-order interpolation may lead to greater estimation errors, particularly with Transect 2 at the Terroir Riffle.

Cross-sections from the model bathymetry and the results for water surface elevations were also used to determine changes in wetted perimeter between target flows. Wetted perimeter refers to the perimeter of a cross

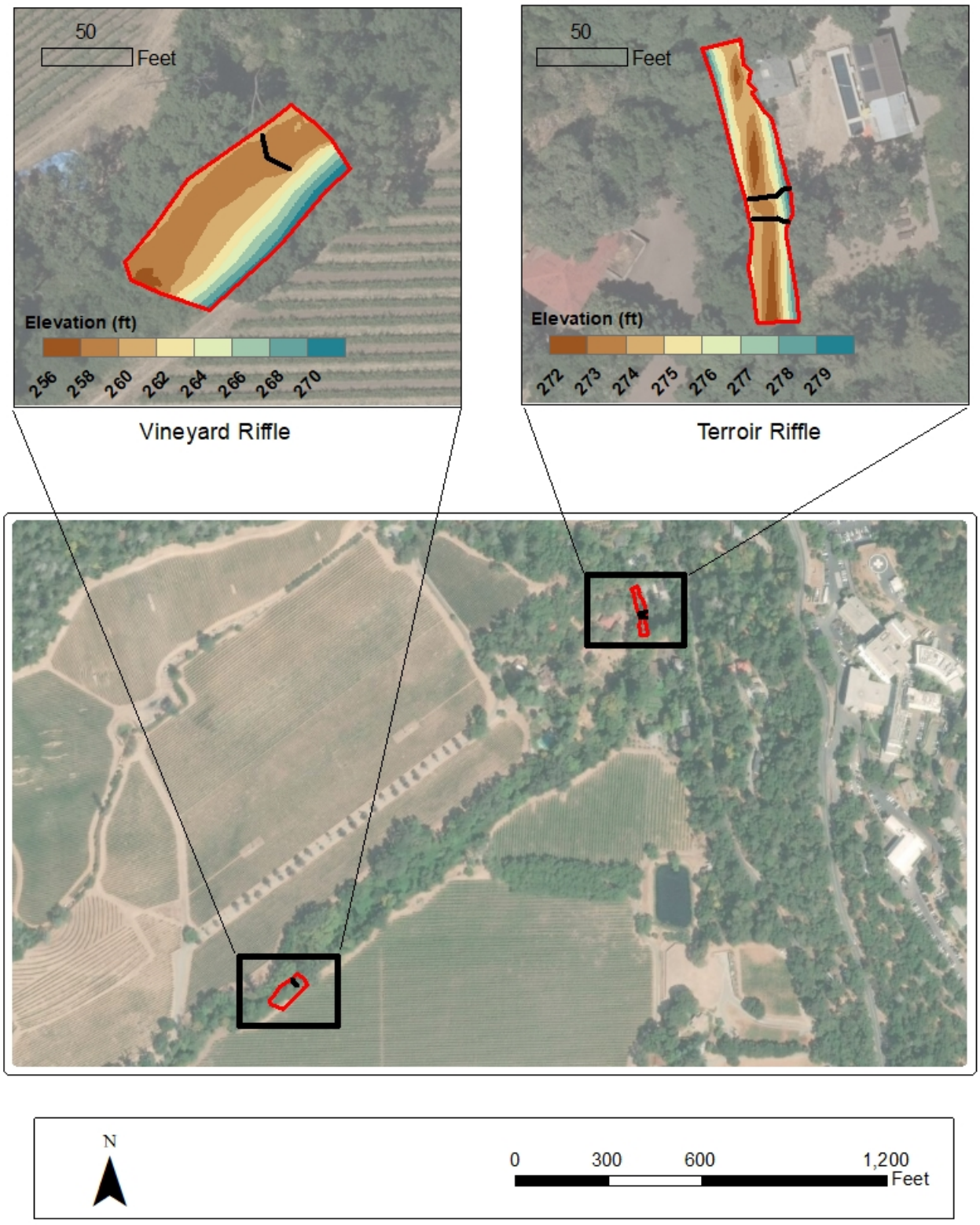


Figure 2. Extent of model domains.

sectional area of a streambed from wetted edge to wetted edge, and is generally used to determine flow needs for maintaining productive riffle habitat in summer/fall (CDFW, 2013). As the City's diversions do not significantly affect the hydrology of Bell Creek during the summer/fall non-diversion season, we used wetted perimeter as a measure of the difference in the extent of wetted riffle habitat at identified critical riffles as a qualitative measure of potential effects on egg incubation flows. Preferred adult steelhead spawning sites are located in pool-tail/riffle head areas. The critical riffles selected for the fish passage analysis represent the shallowest riffles identified in Bell Creek during the habitat assessments and therefore provide a conservative measure of potential streamflow effects on spawning sites.

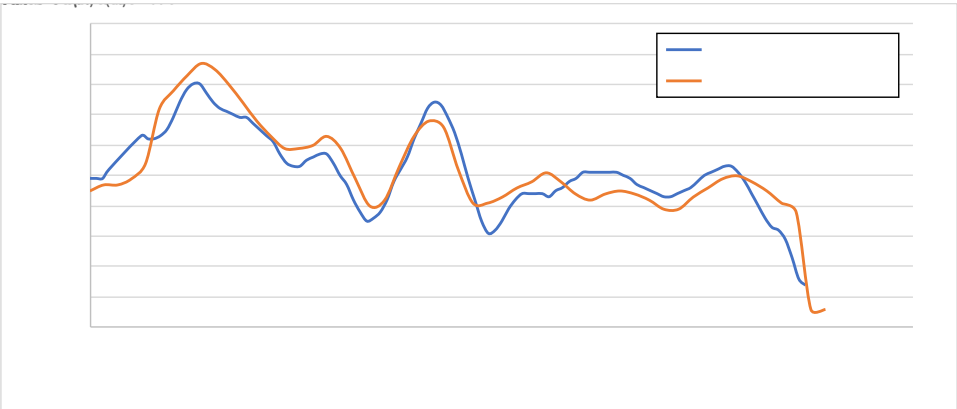


Figure 3. Example of calibrated model results for 10.9 cfs at Transect 1 at the Terroir Riffle.

Hydrology

To estimate unimpaired reservoir inflows and downstream flow accretions, a hydrologic model of the Bell Creek watershed was constructed using the NAM model (DHI, 2014), a deterministic, conceptual, lumped-parameter, rainfall-runoff model that continuously accounts for the water content in three inter-related linear storage reservoirs representing the land surface zone, root zone, and groundwater zone. The primary inputs for the model are precipitation and potential evapotranspiration time series data sets and a series of parameters describing the storage and routing properties for the three storage reservoirs. Values for these parameters were determined primarily through calibration to the total reservoir inflow as estimated based on a reservoir water balance developed from measured changes in reservoir water levels in conjunction with measured reservoir releases, reservoir evaporation, and direct precipitation. The calibration period corresponded to the period February 2, 2017 through March 26, 2018 during which reservoir inflow data and reservoir stage/storage data was collected at short time intervals with stage measurement precision of 0.01 ft. The calibrated model was then used to simulate flows over the period of available rainfall data from April 15, 2009 through March 26, 2018.

Watershed surface areas upstream of the reservoir, between the reservoir and the upper (Terroir) evaluation site, and between the upper (Terroir) and lower (Vineyard) evaluation sites were delineated from available LiDAR topographic data (**Figure 1**). Two precipitation records are available, one at Angwin, located about 0.8 miles east of the eastern edge of the watershed, and one at the water treatment plant located just below the reservoir (**Figure 4**). The mean annual precipitation at each station was compared to the mean annual precipitation variations across the watershed as represented by mean annual precipitation from PRISM (2010).

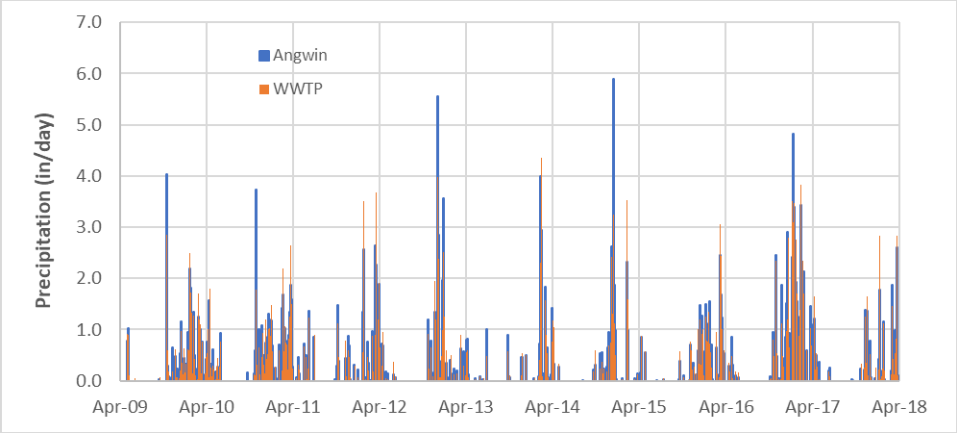


Figure 4: Precipitation data at Angwin and the Water Treatment Plant used in the hydrologic analysis.

The sub-watershed upstream of the reservoir was best represented by the Angwin data and the sub-watersheds below the reservoir were best represented by the water treatment plant data (**Figure 1**). The ratio of the mean annual precipitation within each watershed and at the two weather stations (as described by PRISM, 2010) was used to define scaling factors for precipitation in each sub-watershed. The raw station data was then multiplied by the scaling factors (which ranged from 0.96 to 1.02) to develop a precipitation timeseries for each sub-watershed. Pan evaporation data is available for the reservoir which was used as the potential evapotranspiration (PET) input for the model (**Figure 5**).

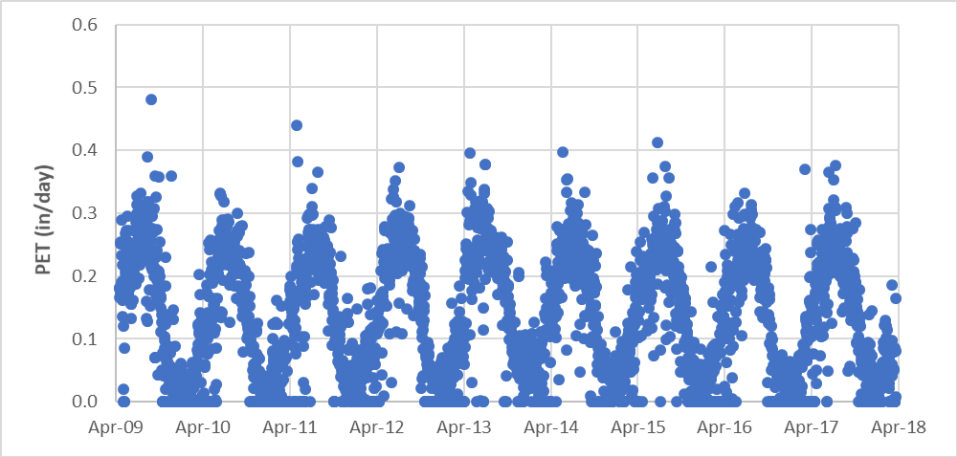


Figure 5: Potential evapotranspiration (PET) data at the WWTP used in the hydrologic analysis.

Several calibration statistics were used to describe the goodness-of-fit between the model simulated total reservoir inflows and the estimated reservoir inflows derived from the reservoir water balance. These statistics include the Mean Error (ME), Root Mean Square Error (RMSE), and the Nash-Sutcliffe model efficiency coefficient (NSME). The storage and routing parameters for the linear reservoirs used to represent hydrologic processes in the NAM model were adjusted to improve the fit between observed and simulated stream flows. The final calibration had a ME of 0.33 cfs, a RMSE of 8.86 cfs, and a NSME of 0.76 (**Figure 6**).

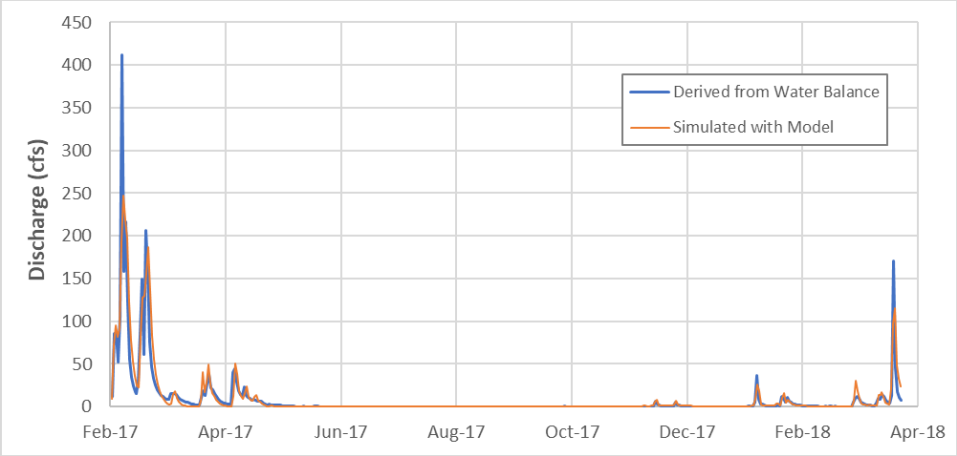


Figure 6: Comparison of total reservoir inflow derived from water balance and calibrated hydrologic model simulation.

In addition, a number of stand-alone hydrologic analyses were conducted. To evaluate the extent to which geomorphic processes downstream of the reservoir are affected by existing permitted operations, a flow frequency analysis was prepared to compare occurrences of peak stream flow events (i.e., exceeding 100 cfs) under unimpaired conditions and permitted operations. Surface water-groundwater interactions were inferred based on the results of various field observations and discharge measurements, and the relative effects of the reservoir operations on mainstem Napa River flows were evaluated through a standard proportional flow contribution analysis of simulated Bell Creek discharges and the USGS Napa River at St. Helena gauge (#11456000).

Assessment Results

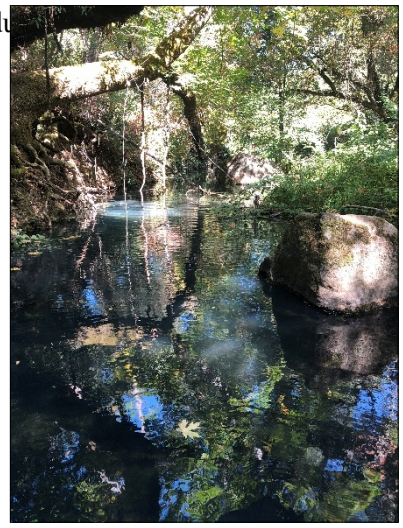
Habitat Quality

Bell Creek is a 3rd order stream draining a watershed of approximately 10.1 square miles, including the sub-drainage of Canon Creek, and consists of approximately 10.6 miles of blue line streams. Mixed hardwood forest and shrubland dominate the watershed with a few patches of mixed conifer forest. The watershed is primarily privately owned. Approximately 1.75 miles of potential habitat are accessible to anadromous salmonids below Bell Canyon Reservoir. Based on the National Marine Fisheries Service (NMFS) Intrinsic Potential (IP) model for CCC steelhead (NMFS 2016), a modeling framework using geomorphologic and hydrologic characteristics of a drainage to estimate the relative likelihood of stream reaches exhibiting suitable habitat for juvenile CCC steelhead under current or historic (i.e., pre-disturbance) conditions (Agrawal et al. 2005), Bell Canyon Reservoir blocks access to approximately 0.5 miles of stream channel that would have provided potentially suitable CCC habitat prior to its construction.

Bell Creek habitat between Bell Canyon Reservoir and its confluence with the Napa River consisted of a fairly even mix of riffles (26%), pools (36%), and flatwater habitat (25%) in 2004. However, pools in Bell Creek are relatively shallow, with only 12 of the 27 (44%) pools measured having a maximum residual depth[5] greater than 2 feet, and only 5 (19%) had a maximum residual depth greater than 3 feet. On 3rd order streams such as Bell Creek, a frequency of 40% of pools with residual pool depth greater than 3 ft is desirable to support properly functioning

5 "Residual pool depth" is defined as the maximum depth of a pool minus the maximum depth of its downstream riffle crest (i.e., the depth of the pool at the point of zero flow). As such residual pool depth is a physical measure of channel topography that is independent of variable streamflow levels.

juvenile steelhead rearing (Flosi *et al.*, 1998). The 2018 habitat inventory results suggest a considerable change in habitat type proportions, with pools accounting for 50% of the surveyed channel length while riffles and flatwater habitats accounted for 24% and 26%, respectively. On average, these pools were also deeper, with 24 (62%) of the 39 pools identified having a maximum residual depth greater than 2 feet, and 11 (28%) with a maximum residu



Examples of extensive, deep pool habitat in Bell Creek

While these results suggest a significant geomorphic shift in habitat conditions between 2004 and 2018, the observed differences in pool abundance and depths appear to be directly related to two primary factors:

(1) Bell Creek contains a number of long (100+ ft) habitat units that Stillwater Sciences and Dietrich (2002) refer to as "run-pools" (i.e., long pools that are shallow relative to their length). Field crews may identify these either as shallow pools or as deep flatwater habitat, and difference in 2004 and 2018 habitat categorization likely played some role in the apparent discrepancy in pool habitat abundance.

(2) More importantly, however, at least three beaver dams were observed in Bell Creek in 2018; one immediately upstream of its confluence with the Napa River and two within the alluvial valley reach of Bell Creek bordered by vineyards. While the lowermost dam had limited hydraulic effect on Bell Creek, the two dams adjacent to the vineyards impounded a total of approximately 720 ft of channel (i.e., almost 10% of the total surveyed length of 7,502 ft), creating extensive pool habitat with average depths exceeding 3 ft and maximum depth exceeding 4 ft. In addition to expanding available pool habitat, the beaver impoundments are assumed to have drowned-out flatwater and riffle habitat within this reach, thereby shifting habitat type proportions. Excluding this 720-ft reach from the analysis reduces the 2018 pool habitat proportion from 50% to 44%. Beaver dams are widely recognized as providing high quality rearing habitat for juvenile salmonids and can significantly increase the density, survival, and production of juvenile steelhead (Bouwes *et al.* 2016). NCRCD (2005) make no mention of beaver dams in Bell Creek or any other central Napa River watershed stream assessed in 2004, and their current presence likely constitutes a significant natural habitat improvement.


Beaver dam (left) and upstream pool habitat (right) in Bell Creek adjacent to vineyards

Twenty-six of the 30 pool tail-outs (87%) measured in 2004 had gravel or small cobble as the dominant substrate, the preferred spawning substrate of adult steelhead. A total of 89% of those pool-tailouts contained embeddedness (the average proportion of individual cobbles embedded in fine substrate materials) levels of less than 50%, but only 11% of the tailouts had embeddedness levels below 25%, which is level considered to indicate good spawning substrate for salmon and steelhead. In 2018, embeddedness ratings below 50% were similarly abundant, indicative of continued suitable spawning conditions.

Shelter ratings in Bell Creek in 2004 were relatively low, with the majority of cover being provided by terrestrial vegetation overhang. The mean shelter rating for pools was 77, with a rating of at least 100 being considered desirable for suitable salmonid habitat function. Less than 5% of the identified shelter consisted of LWD. Our 2018 assessment confirmed the continued relative paucity of LWD, which is also consistent with Stillwater Sciences and Dietrich's (2002) observations of extremely low frequencies of woody debris in stream channels throughout the Napa River watershed.

The riparian corridor of Bell Creek, although relatively narrow, provided a mean canopy density of 84% in 2004 and was rated as being in "good condition" by NCRCD (2005). Hardwood species accounted for the majority (78%) of the riparian corridor, with only 18% consisting of coniferous trees that are typically considered more suitable for creating stable LWD complexity within a channel. Riparian cover in 2018 was similarly dense in most places and dominated by hardwood species. However, several instances of live hardwood trees extending into the wetted channel and providing pool scour and instream cover values were observed in Bell Creek in 2018. Opperman (2005) found that live hardwood LWD played an important role in debris-jam formation (and associated pool formation) in the hardwood-dominated watersheds of northern California even though their dimensions are typically much smaller than conifer LWD, noting that living hardwood features might provide greater longevity and stability than would otherwise be expected from hardwood LWD.

For 2004, NCRCD (2005) reported 13% (approx. 1,200 ft) of the assessment reach being dry, but did not provide the location of the dry reach(es). In September 2018, a dry channel section extending at least 400 ft, and perhaps as much as 600 ft, was observed approximately 0.5 miles downstream of Bell Canyon Reservoir. This dry reach is characterized by substantial deposits of cobble and gravel with sub-surface baseflows as evidenced by the presence of surface flows both upstream and downstream of the dry reach. On the day of the assessment, the City was bypassing the entirety of the estimated reservoir inflow of 0.47 cfs and observed downstream streamflow conditions were therefore representative of the natural (i.e., unimpaired) discharge in Bell Creek at that time. Considering (1) the NCRCD (2005) observations of one or more dry stream reaches, (2) our 2018 observation of a

dry reach at a time when all reservoir inflows were being bypassed, and (3) the fact the USGS topographic map for the St. Helena quadrangle, which is based on aerial photographs taken in 1957 prior to the construction of Bell Canyon Reservoir, depicts Bell Creek as an intermittent stream, it appears reasonable to assume that dry channel reaches periodically occur naturally in Bell Creek during the baseflow season of some years. Surface water-groundwater interactions in the Bell Creek watershed are further discussed below in the *Hydrology* section

Pool scour and cover provided by live hardwood

Dry channel reach

In addition to the assessment of physical habitat conditions in Bell Creek below Bell Canyon Reservoir, a preliminary evaluation of potential effects of the reservoir on downstream water temperatures was conducted. As described above, reservoir inflow and outflow temperatures are not directly comparable as one set of data (inflows) is based on calculated daily mean temperatures as recorded at 15-minute intervals while the other set (outflows) is based on a once-daily measurement conducted by City staff in the mornings between 7:00 and 7:30 AM. Nevertheless, **Figure 7** shows that while inflow and outflow temperatures were similar through much of June, they began to diverge in July. While inflow temperatures remained below 20°C throughout the summer, reservoir outflow temperatures began to exceed 20°C in early July, and reached 23°C for much of August, with two days in August exceeding 23°C. Given that outflow temperatures are measured in the morning and may therefore represent the coolest temperatures of the day, daytime bypass temperatures may in fact be higher, although large diurnal temperature fluctuations are not as common in large lentic bodies of water as in lotic systems. Reservoir temperature profiles have not been collected and the extent to which the reservoir may become temperature stratified is unknown, but data from a temperature logger at a semi-permanent reservoir depth confirm the absence of diurnal temperature swings in summer 2018. Continuous water temperature monitoring conducted by NCRCD (2005) in Bell Creek at Crystal Springs Road (i.e., approximately 1,500 ft downstream of the reservoir) between August 29, 2003 and October 29, 2004 revealed a maximum temperature of 24.4°C and a maximum weekly average temperature (MWAT) of 21.3°C. Bell Creek water temperatures inferred from Bell Canyon Reservoir outflows in 2018 and monitored in 2004 suggest stressful and potentially unsuitable summer rearing conditions for juvenile steelhead, but suitable conditions for other native species such as California roach. Additional temperature monitoring data would be needed to determine potential juvenile steelhead rearing conditions in Bell Creek further downstream of the reservoir and within some of the large, deep pools observed during the habitat assessment.

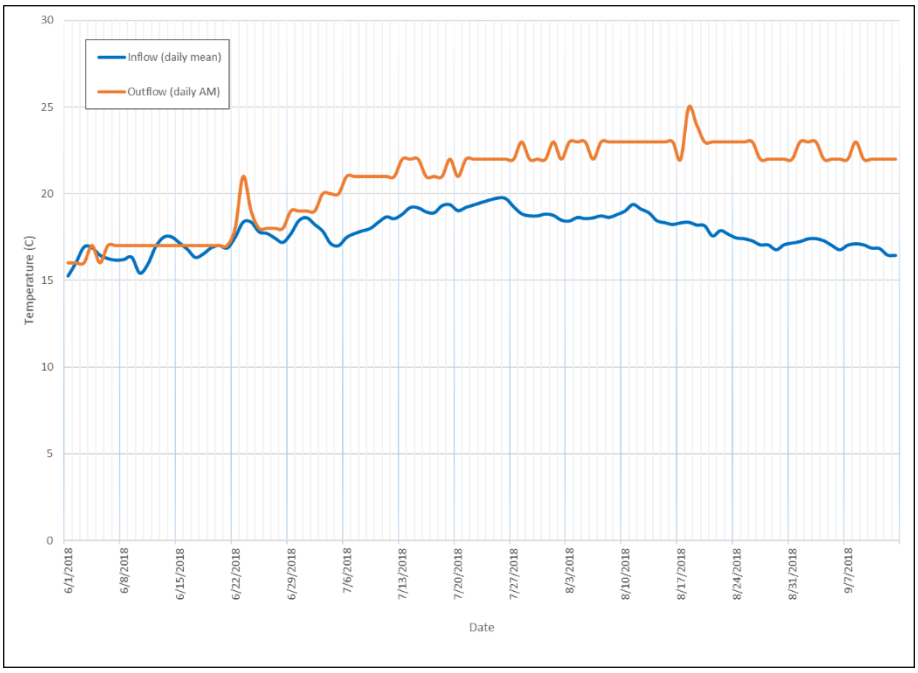


Figure 7. Bell Canyon Reservoir inflow (daily mean) and outflow (daily AM) water temperatures, June 1 – September 13, 2018.

Overall, NCRCD (2005) conclude that Bell Creek below Bell Reservoir is in moderate condition with some areas of high-quality salmonid habitat, primarily in the middle reaches of the surveyed channel. Based on the findings of our 2018 habitat assessment, we concur with this overall qualitative rating of habitat quality in Bell Creek. In particular, the large extent of deep pool habitat, even when the existing beaver dam habitat is excluded, provide for extensive summer rearing habitat for juvenile steelhead and other native fish. Shelter and velocity refuge availability in the form of LWD is generally low, but present. The riparian corridor of Bell Creek, while narrow in some places, provides adequate canopy cover and a buffer from stream-side land uses. Fisheries habitat conditions are further discussed below in the context of the geomorphic characteristic of the watershed.

Geomorphic Channel Conditions

Overview

The drainage area of Bell Canyon Reservoir is about 5.5 square miles. The bedrock geology of the watershed (**Figure 8**) is comprised of various components of the Tertiary-age Sonoma Volcanics that form most of the low mountains east of the Napa Valley. Volcanic rock types include tuffs ("Tst" in **Figure 8** is pumiceous ash-flow tuff; "Tsft" is tuff), andesite to basalt lava flows ("Tsa") and rhyolite flows ("Tsr").

Bell Canyon Creek upstream of the reservoir flows in a relatively deep canyon with relatively steep walls; the channel is mapped as flowing over the ash-flow tuff ("Tst"). The stream channel below the reservoir lies within the Holocene alluvium ("Qha"), which is bordered by ash-flow tuff throughout the reach. The tuff units typically have fine grain size with a range of hardness; however, tuff is generally an aquifer rock that can store and transmit groundwater.

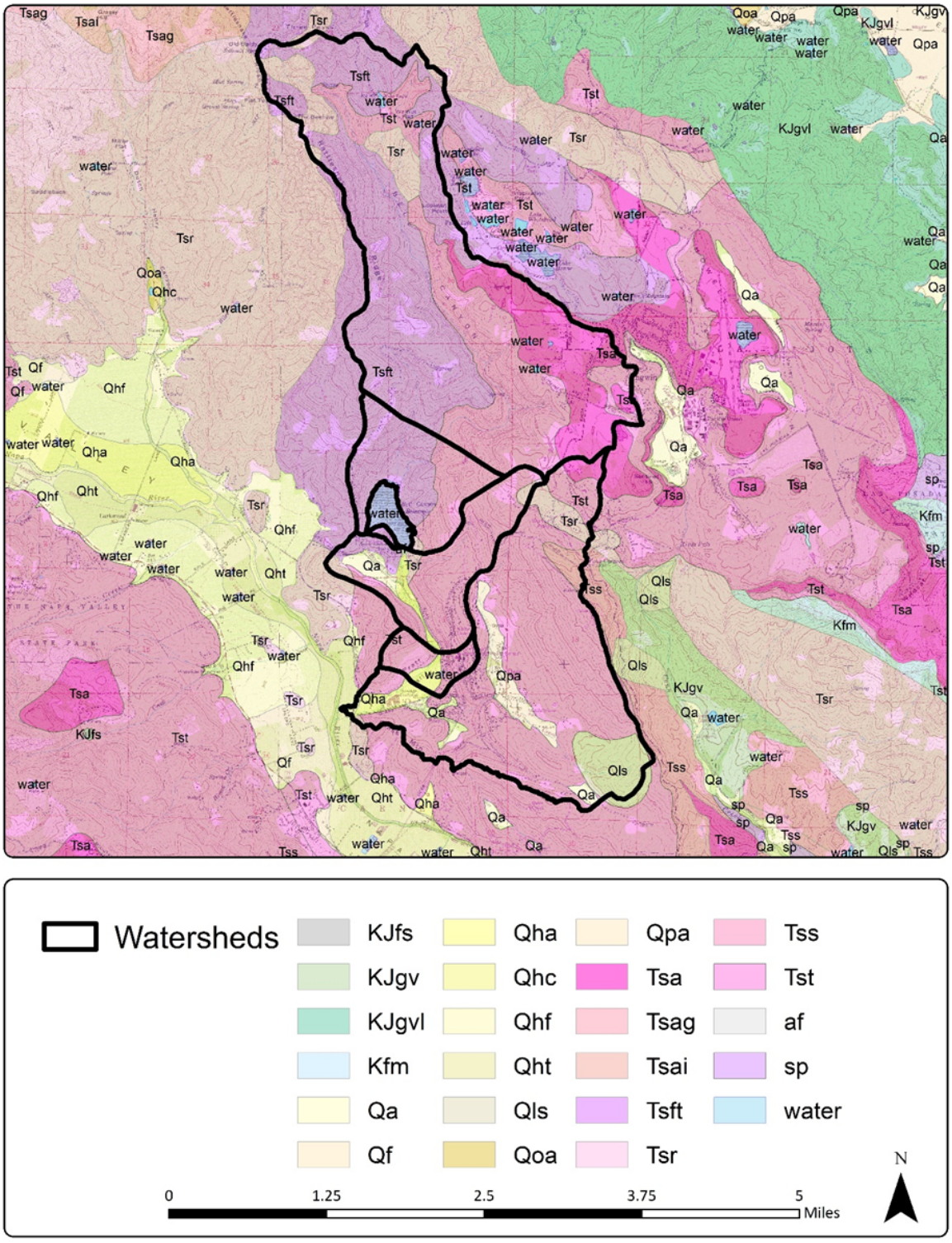


Figure 8. Bedrock geology of Bell Creek (Graymer et al., 2007) (see text for descriptions of selected rock units)

The section of Bell Canyon Creek immediately upstream of the reservoir has some characteristics of an alluvial fan with coarse-textured sediment ranging in size from sand to boulders and multiple-thread channels. The portion of Bell Canyon Creek that now lies under the reservoir where channel gradient would continue to decline approaching the upper valley floor near the elevation of the floor of the reservoir presumably has alluvial fan characteristics. Downstream of the reservoir, there is a relatively narrow strip of alluvium in a narrow valley. Farther downstream where Bell Creek turns to the west as it approaches the Napa River lies the principal body of alluvium in Pratt Valley.

Geomorphology

The primary focus of the geomorphic assessment is the portion of Bell Creek downstream of the reservoir as this portion is accessible to anadromous salmonids, primarily steelhead trout, and is also the area potentially affected by the reservoir. As such, the geomorphic characteristics of the upper watershed above the reservoir are described in general terms, and the geomorphology of the stream channel below the reservoir is described in greater detail.

Bell Creek Upstream of Bell Canyon Reservoir

Based on the bedrock geology, observations of headwater channels at other project sites in the Napa River watershed, and observations of Bell Canyon Creek on City of St. Helena property upstream of the reservoir, the channel bed is relatively steep and is dominated by coarse substrate including cobbles and boulders along with frequent exposures of bedrock. Sand and gravel are present but not generally abundant. It is believed that large landslides are not common in the watershed and sediment supply to the stream system is derived mostly from erosion of stream banks and stored sediment on the bed of stream channels. Stream morphology in the watershed above the reservoir is expected to be primarily step-pool, cascade and bedrock channel types associated with channel slopes > 3% (Montgomery and Buffington, 1993).

The stream channel system upstream of the reservoir is “supply-limited” with respect to long-term sediment transport processes: the stream energy available to transport sediment exceeds the quantity of sediment supplied to the channel. Despite relatively high sediment transport capacity, sediment yield from the watershed above the reservoir is considered relatively low. Sediment deposits at the confluence of Bell Canyon Creek with the reservoir are not extensive but provide evidence of the size distribution of the watershed sediment yield. It is evident that cobbles and boulders are mobile, however the bulk of sediment transport is in the gravel size-range. It would be possible to quantitatively estimate sediment yield from the watershed by mapping sediment deposits in the reservoir. Similarly, the size distribution of sediment could be determined by sampling these deposits. The character and quantity of sediment produced by Bell Canyon Creek is consistent with the characteristics of most stream channels on the east side of the Napa Valley draining watersheds where Sonoma Volcanics are the principal parent material for soil formation.

It is likely that the historic channel of Bell Canyon Creek at the location of the reservoir assumed the form of an alluvial fan where the steep channel of the upper watershed transitioned to the gentler gradient of the alluvial valley floor (now at the bottom of the reservoir). Sediment transport capacity would be expected to decline in this transition resulting in substantial deposition of coarser sediment (gravel, cobbles and boulders). Alluvial fans often form multiple or braided channels in these environments, and the coarse-textured alluvium tends to allow water from the surface channel to infiltrate to the subsurface under some circumstances; this situation is described as a “losing” stream. Depending on the geometry of the fan and the characteristics and depth of the underlying alluvium or bedrock, groundwater may be expected to resurface down-gradient along the channel and discharge

groundwater back to the stream channel (a "gaining" stream situation). The relationship between surface water and groundwater is expressed by spatial and temporal variation in the location of gaining and losing reaches, and by the magnitude of gain or loss of flow. This topic is discussed with respect to Bell Creek in detail in the *Hydrology* section below.

Bell Creek Downstream of Bell Canyon Reservoir

For purposes of this analysis, Bell Creek downstream of Bell Canyon Reservoir was divided into segments (**Figure 9**) based on distinguishing characteristics observed in the field and based on selected geomorphic data. Geomorphic conditions that characterize fish habitat are described in substantial detail, supported by quantitative survey data, for Segments 1 through 6. Segment 7 and the remaining length of Bell Creek below the reservoir are described in narrative fashion. To facilitate comparisons between Bell Creek channel segments and other Napa River tributaries in which similar assessments have been conducted by OEI, the length of each segment is standardized by the ratio of bankfull width (corresponding approximately to a 1.5 to 2-year recurrence interval flow event). This convention has been widely used in "watershed analysis". The frequency or quantity of geomorphic features of interest are also standardized by bankfull width for ease of comparison. It should be noted that interpretation of these metrics may not translate consistently with parallel fish habitat survey data interpretation in all situations. For example, bank erosion features, often considered an indication of undesirable sediment sources, are interpreted to be a measure of geomorphic processes associated with a dynamic stream channel capable of eroding its banks and recruiting sediment (i.e. spawning gravel) to the channel. **Table 1** provides a summary of selected geomorphic data for each stream segment.

Segment 1 (Napa River Reach)

Segment 1 extends from the confluence of Bell Creek and the Napa River upstream to a concrete grade control structure at the Silverado Trail Bridge. Segment 1 is bordered by vineyards on either bank but is largely "natural" in character. The channel bed is typically about 8 ft or more below the elevation of the adjacent terraces forming the floor of Napa Valley. The channel is classified as confined. Segment 1 is steeper than other segments, presumably reflecting long-term channel bed lowering of the Napa River. This segment has a forced pool-riffle morphology with a bed dominated by gravel with substantial sand and cobble.

This reach is in relatively good condition with respect to existing habitat and habitat-forming processes, and exhibits a relatively high degree of channel complexity. Pools are relatively frequent and are often associated with LWD. LWD is relatively common, primarily in the form of live riparian trees and associated woody debris jams and including a small beaver dam near the confluence with the Napa River. Future sources of LWD recruitment are available on the stream banks and on the edge of the adjacent terraces. Sediment on the active bed and stored in bars is mostly gravel, and gravel bars are relatively common. The abundance of gravel bars correlates with channel morphology and fluvial processes that form and maintain pools. Average pool depths are consistent with most of the other channel segments. Bank erosion in this reach is in the middle of the range for Bell Creek; one active feature and one feature suppressed by a bank revetment were observed. Sediment appears to be derived largely from upstream sources. Backwater from the Napa River at flood stage affects channel morphology by inducing sediment deposition; this may be associated with the relatively high frequency of bar features.

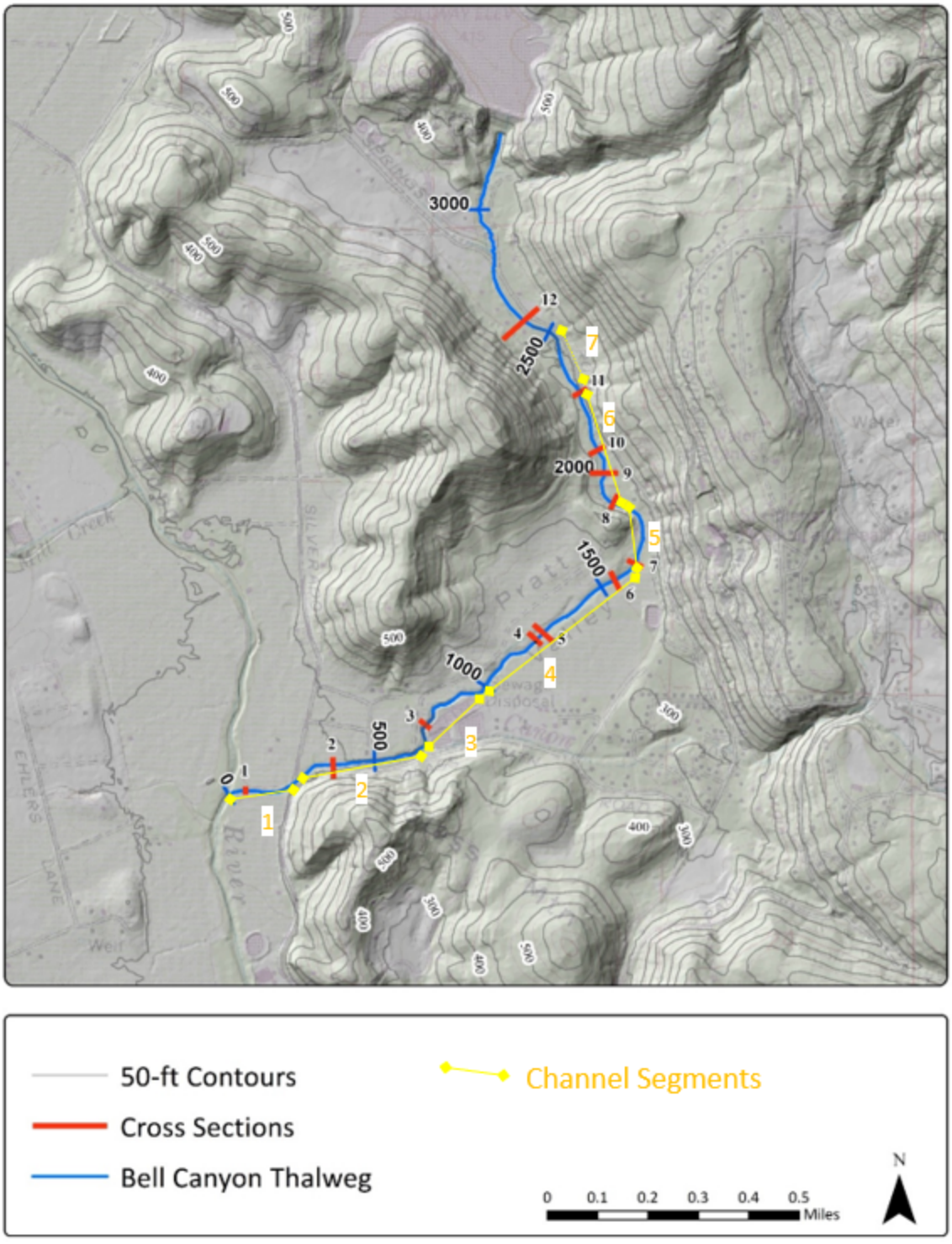


Figure 9. Topographic relief map and location of stream segments and representative valley cross-sections in Bell Creek below Bell Canyon Reservoir. Note that the thalweg stations (at intervals of 500) are in units of *meters*.

Segment 2 (Glass Mountain Road Reach)

This reach extends from the Silverado Trail Bridge grade control structure upstream to the confluence of Canon Creek. Several residential properties lie on the right bank of this stream segment. This segment has a relatively-low slope gradient, possibly reflecting grade control at Silverado Trail, and its character is dominated by revetments along the left bank bordering Glass Mountain Road. The channel is classified as confined and channel morphology is controlled to a significant degree by Silverado Trail grade control and channel straightening and revetments along Glass Mountain Road. The channel bed is typically about 10 ft below the grade of Glass Mountain Road; the elevation of the floor of Pratt Valley on the right bank is somewhat lower. This segment has forced pool-riffle morphology in the lower third, with plane-bed morphology upstream along Glass Mountain Road. Channel substrate is dominated by gravel and cobble with some boulders.

Segment 2 is in relatively poor condition with respect to existing habitat and habitat-forming processes. Pools are relatively infrequent and are most common in the lower portion of the segment where the stream is not located immediately adjacent to Glass Mountain Road. LWD is not common, and it is suspected that LWD accumulation is suppressed by management. Future recruitment of LWD is relatively limited owing to a thin riparian gallery forest adjacent to the channel. There is little sediment stored in bars, and most of this segment has plane-bed ("bowling alley") morphology with relatively little channel complexity. Average pool depths are consistent with most of the other channel segments; a deep and large pool is formed upstream of the Silverado Trail Bridge and grade-control structure. Bank erosion in this reach is not significant and is suppressed by revetments associated with Glass Mountain Road.

Segment 3 (Treatment Plant Reach)

Segment 3 extends from the confluence of Canon Creek upstream to an abandoned flashboard dam site just beyond the upstream extent on the left bank of the sewage treatment plant operated by the local hospital. The valley floor on the right bank is occupied by vineyard. Channel gradient is steeper than Segment 2, but relatively low compared to areas upstream. This channel reach is classified as confined. In many respects, this channel segment is natural in character; however, a section of the channel in the center of the segment has been armored from bank-to-bank with rip-rap, and the left bank adjacent to sewage treatment plant ponds is hardened in some locations. The channel floor is about 13 ft below the valley floor on the left bank and about 10 ft below the valley floor on the right bank. This segment has forced pool-riffle morphology; substrate is gravel with sand, cobble and boulders.

This reach is in relatively good condition with respect to existing habitat and habitat-forming processes, despite an approximately 150-ft long section of rip-rap channel near the center of the segment and other sections of revetment. Pools are reasonably frequent and are sometimes associated with LWD. Pools are the deepest on average in Bell Creek owing in part to confinement and perhaps enhanced by local revetments that may encroach somewhat on the flood-prone width of the channel. Deep pool scour is often associated with sections of streambank erosion, further suggesting that channel confinement may broadly affect channel geomorphology. LWD is moderately common, and it is suspected that LWD accumulation is suppressed by management. Future LWD recruitment potential is substantial in the riparian gallery forest adjacent to the channel. There is relatively abundant sediment stored in bars, and the extent of bank erosion features is the second-highest among Bell Creek stream segments. Channel and habitat complexity is substantial.

Segment 4 (Vineyard Reach)

This reach extends from the treatment plant ponds northeasterly across Pratt Valley to a point where the channel alignment shifts to a more north-south orientation. Vineyards occupy the valley floor on both left and right banks. Channel gradient steepens slightly relative to Segment 3. This long segment is natural in character, with limited direct influence from human land use. The channel floor lies about 12 feet lower than the left bank terrace and about 8 feet lower than the right bank terrace. The channel here is classified as confined to moderately confined; an inset floodplain associated with the present-day channel floor is somewhat developed and noticeable in the LiDAR DEM (**Figure 9**) in the middle third of the segment. Most of the upper third of the segment is occupied by two consecutive beaver ponds. This segment has forced pool-riffle morphology; channel substrate is mostly gravel and cobble with some boulder-size sediment.

This reach is in relatively good condition with respect to existing habitat and habitat-forming processes and is the most-nearly natural segment of Bell Creek. Pools are reasonably frequent and are often associated with LWD. Average pools depths are typical of Bell Creek, notwithstanding two large and deep (> 4 ft) pools at its upper end formed by two beaver dams. Channel confinement relaxes somewhat relative to downstream reaches allowing for some lateral spread of the channel and development of floodplain surfaces. LWD is more abundant than in other Bell Creek stream segments and does not appear to be removed by land managers. Future LWD recruitment potential is substantial in the riparian gallery forest adjacent to the channel. There is abundant sediment stored in bars, and there is a modest amount of bank erosion. Channel and habitat complexity is substantial.

Segment 5 (Terroir Reach)

This reach is relatively short and traverses a section of Bell Creek where residential development occupies both sides of the stream. Bank revetments (rock walls) are found on both sides of the stream in portions of the segment. Channel gradient increases relative to the downstream segment; this segment is classified as confined. Despite the extent of human influence, the channel is relatively natural in character. The channel lies 6-10 feet below adjacent valley floor terraces. Channel morphology is forced pool-riffle with expressions of step-pool and cascade morphology in some locations. Channel substrate is mostly cobble with boulders.

This reach is in relatively good condition with respect to existing habitat and habitat-forming processes despite the extent of residential development on both banks. Pools are frequent and are sometimes associated with LWD. Average pools depths are typical of Bell Creek, although on the lower end of the range. Channel confinement is accentuated by rock walls along the banks in some portions of the segment. LWD is relatively abundant despite residential land use. Future LWD recruitment potential is substantial in the riparian gallery forest adjacent to the channel. There is relatively little sediment stored in bars, and significant bank erosion was not observed. Channel and habitat complexity is substantial.

Segment 6 (Winery Reach)

This reach extends upstream to a point where the channel steepens and may become seasonally intermittent. A winery and access road occupy the right bank; the left bank includes sparse residential development. Overall the channel is relatively natural in character. The channel is moderately confined to unconfined and is noteworthy for two large sections of eroded bank, large bars, and a unique floodplain surface wider than the active channel in the center of the segment. The channel floor is 3-7 ft below the adjacent floodplain and terrace surfaces. Channel

morphology is forced pool-riffle with periodic step-pool and cascade morphology. The channel substrate is mostly cobble with gravel and sand.

This reach is in relatively good condition with respect to existing habitat and habitat-forming processes despite the commercial and residential development. Pools are not frequent and are sometimes associated with LWD.

Average pools depths are typical of Bell Creek, although on the upper end of the range. The channel is moderately confined or unconfined in much of this segment, a unique characteristic of this segment. Most of this segment has a substantial width of floodplain. LWD is relatively uncommon despite substantial LWD recruitment in the riparian gallery forest adjacent to the channel. There is a high volume of sediment stored in bars and floodplain deposits. There is a high occurrence of bank erosion. Channel and habitat complexity is substantial.

Segment 7 (Dry Reach)

This reach extends from a short distance below the winery access bridge near the first point of dewatered channel upstream to the point where surface flow is again present. This reach is relatively steep compared to downstream but includes portions of channel that are somewhat wider than found downstream. The downstream end of this segment includes a succession of cascade and step-pool features that are distinguishing. Cobbles are the dominant substrate with boulders and gravel.

Table 1. Summary of quantitative geomorphic data for Bell Creek stream segments

Segment	Slope (%)	Length (ft)	Bankfull Width (BW) (ft)	# of BWs	# Pools	BW/Pool	Pool Max. Depth (ft)	Pool Avg. Depth (ft)	# Bars	Total Bar Volume (ft^3)	Bar Vol. per BW (ft^3)	# LWD Features	LWD per BW	Bank Erosion (ft^2)	Bank
1	1.4	660	25	26	6	4.3	2.8	2.2	9	6680	257	4	0.15	360	14
2	0.4	1370	25	55	9	6.1	4.7	2.3	4	3900	71	5	0.09	0	0
3	0.65	1170	25	47	9	5.2	4.2+	3.0	7	13380	285	2	0.04	1540	33
4	0.67	2080	30	69	13	5.3	4.1	2.3	13	24740	359	15	0.22	750	11
5	0.90	780	28	28	6	4.7	3.4	2.1	3	7750	276	4	0.14	0	0
6	0.86	1000	28	36	5	7.2	2.7	2.5	2	17470	485	2	0.06	1910	53
7	1.3	1310	34	39	2+	N/A	3.5	3.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Habitat Geomorphology in Comparison with Regional Studies

Prior work on habitat geomorphology by Dr. O'Connor in collaboration with SFEI (Pearce et al., 2002; 2003a; 2003b) suggested that Napa River tributaries underlain by volcanic rocks (e.g., Soda Creek) have distinct differences in many habitat geomorphology parameters from tributaries underlain by sedimentary rocks (e.g., Carneros Creek and Sulphur Creek). The Soda Creek watershed, located about 12 miles southeast of Bell Creek, is a reasonable analog to Bell Creek for the purpose of general comparison of habitat geomorphology. Soda Creek has a drainage area of about 4.7 mi^2; Bell Canyon Creek above Bell Canyon Dam has a drainage area of about 5.5 mi^2. Mean annual precipitation in the Soda Creek watershed ranges from about 24 inches near its confluence with the Napa River to about 36 inches near the ridge tops (Pearce et al., 2002); annual rainfall for Bell Creek is somewhat greater. Soda Creek does not contain any on-stream reservoirs of significance. The four downstream-

most sample reaches in Soda Creek have slopes that are steeper overall (1.8% average) compared to the overall slope of Bell Creek below the reservoir (1.0%), but they are nevertheless comparable and fall primarily within the range of slopes where forced pool-riffle and plane-bed morphology are expected. The overall level of development in the two watersheds is similar but appears more concentrated in the reach of Bell Creek below the reservoir relative to similar but somewhat more dispersed development in Soda Creek.

Soda Creek habitat geomorphology data were more detailed and were derived from quantitative surveys of stream reaches of a length equivalent to 25 times the bankfull width. Bell Creek habitat geomorphology data were less detailed but based on the same conceptual model of habitat geomorphology. Data from Bell Creek can be compared to data from Soda Creek with respect to the frequency of pools, depth of pools, woody debris abundance and influence on pool formation, sediment storage in bars and bank erosion rates.

Pool frequency can be normalized for stream size by expressing pool frequency in terms of the average distance between pools in bankfull width units of length (i.e., divide surveyed stream length by the total number of pools surveyed and then divide by bankfull channel width). For reference, alluvial channels that can erode their banks and have riffle-pool morphology (generally <1% slope) have pool spacing of about 5 to 7 bankfull widths. In the four comparison reaches of Soda Creek, pool frequency ranged from about 2.8 to 12.5 bankfull widths, with a mean of about 6.6. In Bell Creek, pool frequency ranged from 4.3 to 7.2 bankfull widths with a mean of 5.5. The size threshold of pools in the Soda Creek surveys was smaller than in Bell Creek, so the extent to which pools are more common in Bell Creek is understated.

Pool residual depths were substantially greater in Bell Creek than in Soda Creek. Bell Creek residual pool depths had a median value of about 2.25 ft and a mean of about 2.4 ft. In contrast, only 20% of pools in Soda Creek were 2 ft deep or greater.

Woody debris abundance in Bell Creek and Soda Creek was similar, with much or most of the woody material influencing stream morphology in the form of live riparian trees. Expressed as the average number of woody debris per unit of stream length as bankfull width, Bell Creek and Soda Creek had the same woody debris frequency of 0.12 per bankfull width. The Soda Creek survey used a minimum diameter of 20 centimeters (cm); no minimum diameter was established for Bell Creek, but most LWD in Bell Creek had a diameter of 30 cm (~1 ft) or greater. Woody debris was rarely found to be a primary factor in formation of pools in Soda Creek and Bell Creek; this appears to be a distinguishing characteristic that separates streams in volcanic bedrock from those in sedimentary bedrock.

Observations of sediment storage in Soda Creek surveys was focused on the active channel bed and bars. The survey of sediment storage in Bell Creek did not exclude active channel bars but in practice focused on sediment deposits that were at the margin of the active channel and therefore representative of sediment dynamics of less frequent floods. This may reflect a characteristic of Bell Creek that distinguishes it somewhat from Soda Creek: fewer prominent gravel bars and gravel deposits in the active channel. That said, the volume of sediment stored in gravel bars in Bell Creek normalized by stream length was about 3 cubic meters (m^3) per meter of stream length compared to an average of about 1 m^3 per meter in the four comparable reaches of Soda Creek. It is likely that Soda Creek has substantial volume of sediment stored in bars at the margins of the active channel that were not measured, and that Bell Creek does not necessarily have greater quantities of sediment in storage than Soda Creek. It is apparent, however, that Bell Creek does have substantial sediment in storage that can be eroded into the active channel.

Bank erosion and streamside landslides are important sources of coarse sediment in both Soda Creek and Bell Creek. While erosion of sediment to streams is often regarded as deleterious to fish habitat, the availability of gravel-size sediment for spawning habitat in watersheds with volcanic bedrock such as Soda Creek and Bell Creek may depend largely on this erosion process as large landslides appear absent from these watersheds. Comparing Bell Creek data to Soda Creek data is difficult in that we only measured the height and length of erosion features in Bell Creek, whereas in Soda Creek the rate of erosion was also estimated. If the lateral retreat rate in Bell Creek is assumed to be 1 m over the lifetime of the observed erosion feature, the mean bank erosion rate in Bell Creek is about 0.2 m^3/m. This rate would be in the lower range of estimated erosion rates in comparable portions of Soda Creek, but of the same order of magnitude. In other words, bank erosion rates in Bell Creek appear to be somewhat lower but similar in magnitude to those in Soda Creek.

Interpretation of Bell Creek Habitat Geomorphology

Observations of channel conditions and processes indicate that Bell Creek is a reasonably dynamic stream. As described further below, seasonal peak flows associated with reservoir spill events occur in most years and appear to be sufficient to maintain channel geometry (width and depth), including a significant degree of variability associated with local conditions. LWD sources are significant, and compared to other Napa River tributary streams, some LWD, particularly live trees extending into the wetted channel, is present and forms an active component of channel morphology. Pools are reasonably abundant, but instream shelter for fish would be improved with if more LWD were present in the active and bankfull channel. Bell Creek erodes its banks locally, most significantly in Segment 6, and this erosion recruits significant quantities of gravel. The quantity of sediment in storage in bars is also significant. The extent of spawning habitat in Bell Creek appears somewhat limited owing in part to the high proportion of large cobbles on much of the stream bed. It is unclear whether interception of sediment in the reservoir has had a significant effect on the size distribution of sediment below the reservoir; however, it does appear somewhat deficient in gravel patches suitable for spawning. Nevertheless, Bell Creek appears to be in reasonably good condition with respect to habitat conditions and geomorphic processes that create and maintain fish habitat.

Habitat-Flow Relationship

Table 2 summarizes the results of the fish passage depth analysis for surveyed and modelled discharges at the two critical riffles on Bell Creek. **Figures 10 through 12** depict the riffle depth-to-discharge relationship, including linear regression equation, for the three critical riffle transects. For Transect 2 at the Terroir riffle, relationships including and excluding an outlier value are presented. The estimated streamflows required for unimpeded adult steelhead migration at the three assessment transects range between 9.4 cfs and 10.5 cfs, and the estimated smolt outmigration passage discharge ranges from 5.1 cfs and 5.9 cfs (**Table 3**).

Based on these findings, we estimate that streamflows of 11 cfs and 6 cfs would provide suitable passage conditions for adult and smolt steelhead, respectively, in Bell Creek downstream of Bell Canyon Reservoir, and that the existing permitted bypass requirements are insufficient to ensure unimpeded fish passage. However, as further discussed below, frequent reservoir spill events likely provide a number of passage and spawning opportunities annually under existing operations.

Table 2. Bell Creek critical riffle depths at surveyed and modelled discharges

Riffle	Data Source	Discharge (cfs)	10% Criteria Depth (ft)	25% Criteria Depth (ft)	Critical Riffle Depth (ft)
Terroir, Transect 1	Field	0.5	0.23	0.20	0.20
		2.2	0.33	0.29	0.29
		5.4	0.42	0.37	0.37
		6.9	0.48	0.46	0.46
		9.2	0.51	0.49	0.49
		10.9	0.69	0.61	0.61
	Modeled	10.9	0.74	0.62	0.62
		11.0	0.76	0.63	0.63
		12.0	0.81	0.68	0.68
		13.0	0.84	0.72	0.72
Terroir, Transect 2	Field	0.5	0.25	0.16	0.16
		2.2	0.27	0.24	0.24
		5.4	0.49	0.41	0.41
		6.9	0.51	0.44	0.44
		9.2	0.54	0.35	0.35
		10.9	0.66	0.55	0.55
	Modeled	10.9	0.72	0.69	0.69
		11.0	0.74	0.71	0.71
		12.0	0.8	0.77	0.77
		13.0	0.86	0.83	0.83
Vineyard, Transect 1	Field	0.4	0.23	0.18	0.18
		2.0	0.30	0.31	0.30
		5.2	0.46	0.44	0.44
		5.4	0.46	0.40	0.40
		8.8	0.59	0.58	0.58
	Modeled	8.8	0.54	0.55	0.54
		10.0	0.59	0.59	0.59
		11.0	0.63	0.62	0.62
		12.0	0.67	0.66	0.66
		13.0	0.7	0.69	0.69

Table 3: Bell Creek critical riffle discharges for adult and smolt steelhead passage

Riffle	Adult Passage Flow (cfs)	Smolt Passage Flow (cfs)
Terroir Transect 1	10.5	5.6
Terroir Transect 2, w/o Outlier	9.9	5.9
Terroir Transect 2, w/ Outlier	9.4	5.5
Vineyard	10.2	5.1

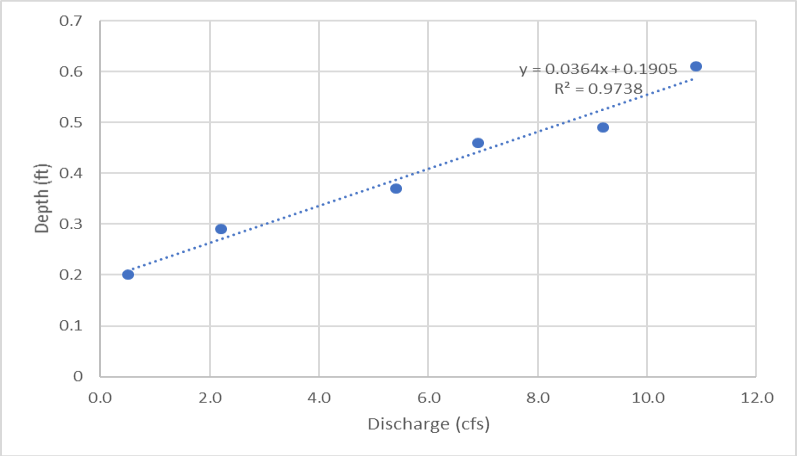


Figure 10: Riffle depth-to-discharge relationship for Transect 1 at the Terroir Riffle.

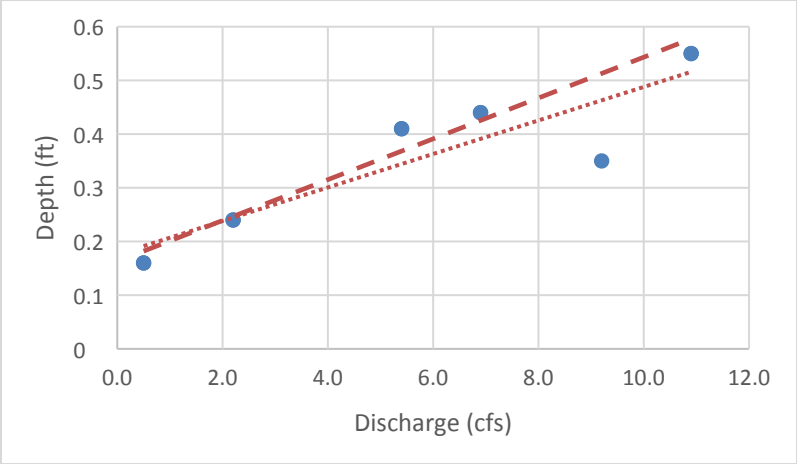


Figure 11: Riffle depth-to-discharge relationship for Transect 2 at the Terroir Riffle including (lower, dotted line) and excluding (upper, dashed line) outlier at 9.2 cfs.

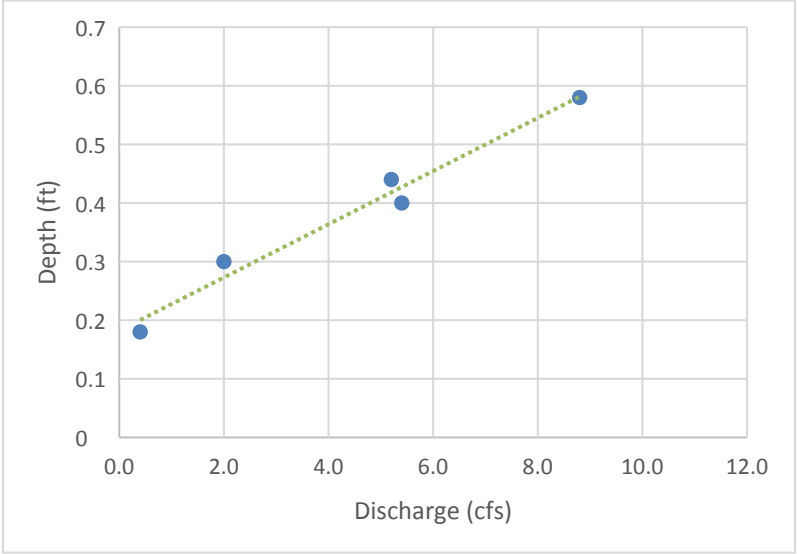


Figure 12: Riffle depth-to-discharge relationship for the Vineyard Riffle.

Hydrology

Unimpaired Inflow Simulation

The simulated reservoir inflows and additional flow contributions to the upper (Terroir) and lower (Vineyard) evaluation sites for the April 2009 to March 2018 period are shown in **Figure 13**. Although there is significant scatter in the data, the additional flow contributions to the downstream sites are well-described using linear relationships (**Figure 14**). The regressions indicate that after adjusting for a small negative y-intercept (representing the minimum reservoir inflow above which additional flow is generated at the downstream sites), additional flow contributions to the upper (Terroir) and lower (Vineyard) evaluation sites are approximately 15.3% and 19.2% of the total reservoir inflow respectively (**Figure 13**). The additional drainage areas contributing to the upper and lower sites are approximately 17.2% and 21.4% of the reservoir inflow drainage area. The percentages arrived at by regression of the simulation flow data are similar but somewhat lower than the relative drainage areas would suggest, which intuitively makes sense since rainfall rates are moderately higher in the reservoir inflow drainage area than in the downstream drainage areas. The equations presented in **Figures 14** represent a simple means of approximating the additional flow contributions to the upper and lower evaluation sites for the purposes of adjusting bypasses to meet downstream targets at the evaluation sites. For example, the model predicts that when reservoir inflow is 11.0 cfs, the mean predicted stream flow accretion between the reservoir and the Terroir and Vineyard sites is 1.65 cfs and 2.03 cfs, respectively.

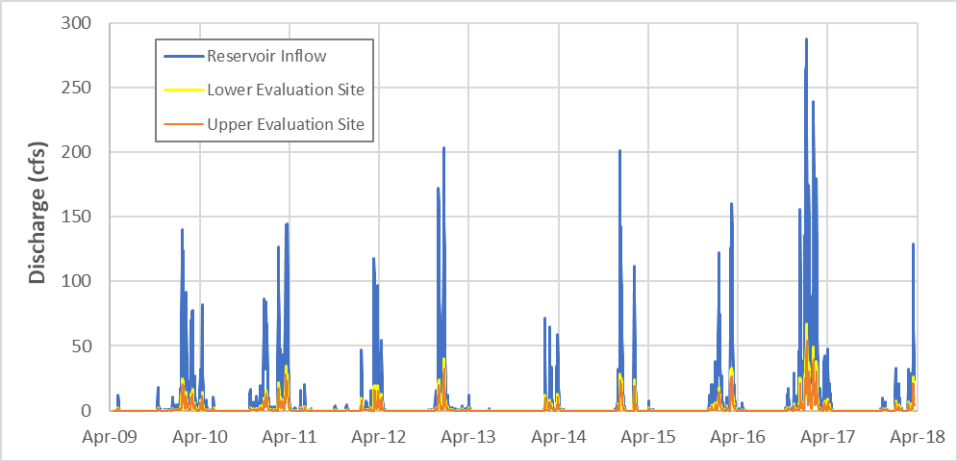


Figure 13: Total reservoir inflow and additional flow contributions to the Terroir (upper) and Vineyard (lower) evaluation sites as simulated with the hydrologic model.

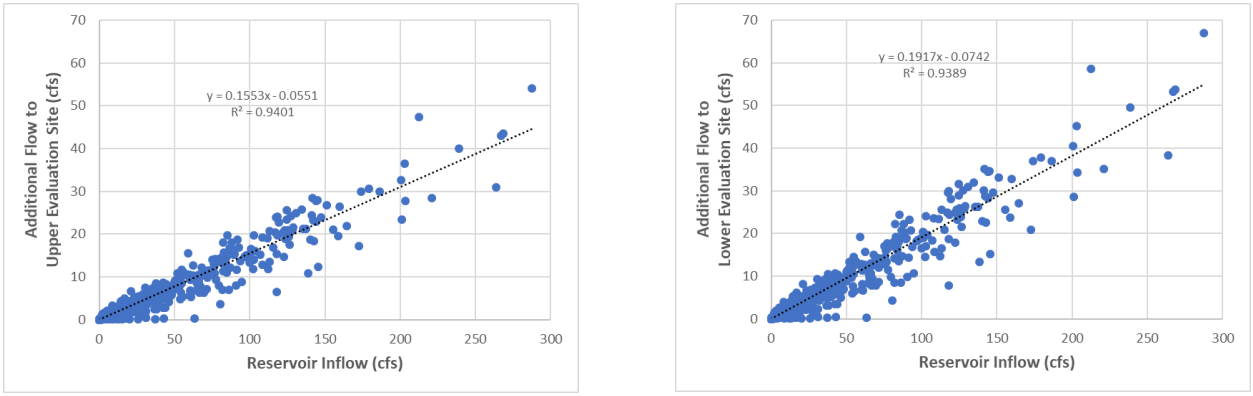


Figure 14: Relationships between the total reservoir inflow and additional flow accretions to the Terroir (left) and Vineyard (right) sites as simulated with the hydrologic model.

Based on these findings, we anticipate that during the winter and spring rainy season, bypassing the estimated fish passage flow rates at the reservoir will meet or exceed those requirements at the Terroir and Vineyard critical riffle sites. Potential streamflow losses between the reservoir and the evaluation sites may occur during the dry summer season and are discussed further below.

Flow Frequency Analysis

Stream bed mobility (the degree to which streambed sediment can be entrained and transported by flow) can be evaluated using sediment transport theory embodied by the Shields equation (e.g. Julien, 2010, pp. 143-150). This relates stream hydraulics (flow depth, velocity, bed shear stress) to a maximum sediment grain diameter representing the median sediment diameter of the stream bed. A common hypothesis for gravel bed streams is that the stream discharge corresponding to a 1.5 to 2-yr recurrence interval flood should entrain much of the streambed on riffles and bars.

USGS StreamStats software provides a means of estimating the 2-yr flood based on regional flood frequency relationships determined from USGS stream gauge data. For the reservoir contributing drainage area, the 2-yr flood is estimated to be 335 cfs. The lower and upper confidence bounds of the prediction interval are 137 and 818 cfs, respectively. For the full contributing area of Bell Creek at its confluence with the Napa River, the 2-yr flood is estimated to be 532 cfs with lower and upper bounds of the prediction interval of 218 and 1,300 cfs, respectively.

Field observations at several locations in Bell Creek below the reservoir indicate that bankfull depth is at least 2 to 2.5 ft. This information can be used to help validate estimates of channel hydraulics for bankfull flow. At two locations, the upper (Terroir) and lower (Vineyard) evaluation sites, channel cross-sections were surveyed. The cross-section data were used for at-a-station hydraulic analysis with the aid of the NRCS Cross-section Analyzer (an Excel macro workbook). Flows in the 300 to 400 cfs range that correlate with the mean estimate of the 2-yr flood had flow depths of about 2.5 to 3 ft. Bed shear stress for these flows at the Terroir and Vineyard sites are predicted to entrain sediment in the size range of about 50 to 75 mm (coarse gravel and small cobble sizes). This size range is reasonably representative of large portions of the stream bed.

Simulated unimpaired flows (using the NAM model) for WY 2010 through 2018 indicated only one peak flow approaching the 300 cfs threshold (about 287 cfs in WY 2017). Annual peak flow records for the Napa River at St. Helena (USGS Gauge # 11456000) suggest that flows with recurrence intervals of about 2-yrs occurred in WYs 2011, 2013, and 2017. These years do correspond to the years in the Bell Creek hydrologic record with the highest peak flows. It appears that the 2-yr flow estimated for Bell Creek at the reservoirs is probably lower than the mean estimate of 335 cfs derived from USGS StreamStats.

To provide perspective on potential geomorphic effects of the reservoir, a flow-above-threshold analysis was conducted for simulated unimpaired flows and existing permitted bypass operations. The flow threshold evaluated is 100 cfs and was chosen to represent flow magnitude approaching the onset of entrainment of the streambed. **Table 4** summarizes the number of flow events exceeding 100 cfs in WYs 2010 to 2018. During the three years thought to represent bankfull flow events based on the USGS Napa River at St. Helena gauge (2011, 2013, 2017), the number of flow-above-threshold events was the same under permitted management as under unimpaired conditions. This indicates that in relatively wet years, Bell Canyon Reservoir fills and spills relatively frequently, generating peak flows that are responsible for maintaining geomorphic processes downstream. During drier years (e.g., WY 2015), existing reservoir management may reduce the frequency of these events somewhat. However,

at least one peak event occurred in seven of the nine simulated years under permitted operations, and in only one year (WY 2018) did existing operations result in no peak flow event when at least one would have occurred under unimpaired conditions. Overall, the simulation suggests that existing permitted operations would have reduced the frequency of peak events by 15%, from 22 to 18, over the 9-year period of simulation. Therefore, existing operations do eliminate some peak flow events, but such events still occur with sufficient frequency to maintain geomorphic processes downstream.

Table 4. Number of flow events exceeding 100 cfs in WYs 2010 through 2018 under unimpaired and existing permitted operations of Bell Canyon Reservoir

Water Year	Unimpaired Flow	Permitted Bypass
2010	2	1
2011	3	3
2012	2	1
2013	2	2
2014	0	0
2015	3	2
2016	3	3
2017	6	6
2018	1	0
Total	**22**	**18**

Surface Water-Groundwater Interaction

Hydrologic work in Bell Creek below the reservoir and on the reservoir water balance since December 2016 has provided insight on the seasonal expression of the relationship between surface flows and groundwater. A parallel tributary channel that conveys runoff from a much smaller drainage area than Bell Canyon, located just to the west of Bell Canyon Creek as it approaches the reservoir, was observed to be in a "losing" condition on numerous occasions between January 2017 and late-2018. Evidence of a losing reach in the upper alluvial fan of Bell Creek was obtained from a series of four stream flow measurements over about 500 ft of channel immediately upstream of the reservoir on April 25, 2018. Stream flow declined by over 50% from 0.88 cfs a short distance upstream of the Bell Canyon Creek gauging station to 0.41 cfs near the reservoir. This losing reach phenomena occurred about two weeks after the last significant runoff-producing rainstorm of Water Year (WY) 2018 when the watershed remained relatively well-charged from winter runoff.

In July 2018, at the time of the flow-habitat relationship investigations described above, the Bell Canyon Reservoir bypass release was 0.43 to 0.44 cfs. Measured streamflow at that time at the upper (Terroir) site (**Figure 1**) approximately 0.85 miles downstream of the reservoir was 0.59 cfs, indicating a "gaining" condition downstream of the reservoir in early summer. At the same location in mid-September, stream discharge was about 0.34 cfs at a time when reservoir bypass was about 0.47 cfs, indicating a "losing" condition. On the same day in September, a section of Bell Creek of at least 400 ft and perhaps as much as 600 ft in length was completely dewatered; this section of the channel is approximately centered on thalweg station 2,500 (**Figure 9**). Surface flow in the stream re-emerges in and just above the narrow "throat" of the lower Bell Creek canyon over a reach of about 250 feet characterized by two or three flights of boulder steps and cascades in the channel near the location of cross-section 11 (**Figure 9**). Based on these observations, it is inferred that a body of alluvium lies in the upper valley of Bell Creek between the reservoir and cross-section 11 that is seasonally-prone to becoming a losing reach with discontinuity of surface flow.

Additional evidence of substantial exchange between surface water and groundwater can be inferred based on flow observations associated with controlled releases from the reservoir undertaken in July 2018. The initial

controlled release of about 9 cfs required 3.25 hours of travel time (**Figure 15**) to reach the upper (Terroir) evaluation site, and about 4 hours to peak. The expected arrival time was about 1.25 hours based on a minimal estimate of mean velocity of 1 ft/sec and no losses to groundwater. The lengthy delay in the arrival of the "flood wave" is interpreted to be a manifestation of the time required for the increased flow to fill available storage space in the streambed and near-bank zone (i.e., the hyporheic zone). After the first set of controlled releases on July 5, a second set of releases occurred on July 6. The delay in detection of the "flood wave" on the second day was about 2.25 hours, suggesting that a portion of hyporheic storage filled on the first day remained filled when the next controlled release began about 10 hours after standard bypass flows were resumed. Furthermore, based on flow records from the upper (Terroir) site for the five-day period from July 5 through July 9, cumulative streamflow was about 14.6 acre-feet (af). In comparison, reservoir bypass totaled about 16.6 af, indicating stream losses of about 2.0 af or 12% of the bypass flow for that period.

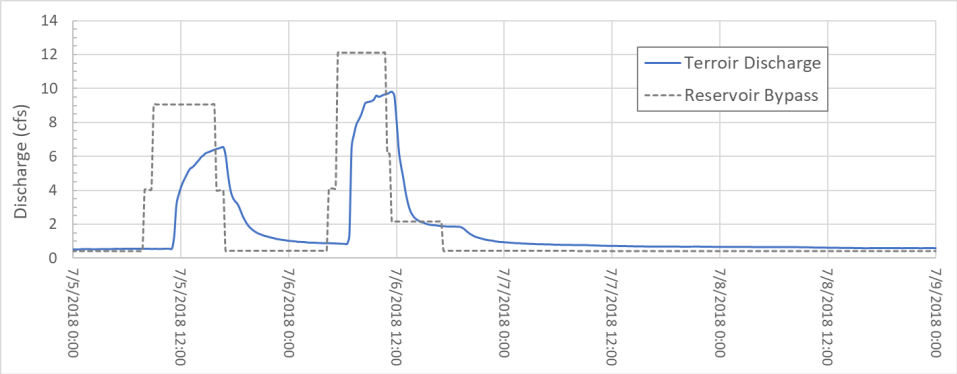


Figure 15. Upper (Terrior) evaluation site discharge during controlled reservoir release, July 2018.

Relative Contribution to Napa River

The ratio of drainage area of Bell Canyon Creek at Bell Canyon Reservoir to the drainage area of the Napa River at St. Helena is 0.07; notwithstanding confounding factors such as differences in precipitation rates, stream geology, and impairment by other diversions, this ratio provides a rough estimate of the ratio of Bell Canyon Creek flows to Napa River flows. **Table 5** summarizes mean monthly mean discharges for simulated unimpaired and permitted bypass releases at Bell Canyon Reservoir as well as for the mainstem Napa River at St. Helena discharges for WY 2010-2018. **Figure 15** graphically depicts the same data. It is important to keep in mind that the USGS Napa River at St. Helena gauge documents impaired discharges, and we did not attempt to simulate unimpaired discharges or back out permitted water right diversions occurring upstream of the gauge.

Nevertheless, **Table 5** and **Figure 15** show (a) the relatively minor contribution of unimpaired Bell Creek flows to mainstem Napa River flows, and (b) the minor reduction in unimpaired discharges created by the City's diversion. As discussed in more detail below, Bell Canyon Reservoir fills and spills on a regular, near-annual basis. After initial filling in the early part of the water year, monthly averages of mean daily discharges from the reservoir are essentially identical to unimpaired discharges for the remainder of the winter and spring. During the summer and late fall, simulated unimpaired discharges, and therefore permitted bypasses releases, approach zero at a time when the Napa River at St. Helena gauge also frequently reports no measurable discharge. Note that summer mean monthly discharges of 0.4 cfs reported for the permitted operations in **Table 5** represent an average

of summer bypass flow releases made by the City in accordance with past accounting methods and likely represent releases in excess of those required under the terms of its permits (i.e., exceeding actual inflows).

Table 5. Mean monthly discharges for simulated unimpaired and permitted bypass releases at Bell Canyon Reservoir, and in the mainstem Napa River at St. Helena, WY 2010-2018.

			Mean Monthly Discharge, NAM-**Simulated Unimpaired Flow** to Reservoir (cfs)									
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
2009										1.53	0.45	2.24
2010	37.53	28.48	15.36	15.68	1.26	0.02	0.00	0.00	0.00	1.40	2.64	30.56
2011	9.82	28.31	53.80	1.95	1.27	1.94	0.02	0.00	0.00	0.41	0.76	0.11
2012	4.90	1.79	35.36	11.94	0.02	0.00	0.00	0.00	0.00	0.04	6.73	65.20
2013	3.60	0.27	0.63	1.46	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00
2014	0.00	9.02	12.90	8.81	0.00	0.00	0.00	0.00	0.00	0.00	0.43	47.32
2015	0.17	21.16	0.02	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.02	4.09
2016	33.76	3.06	44.71	0.82	0.03	0.00	0.00	0.00	0.00	2.66	4.40	27.56
2017	102.38	92.72	9.68	8.73	0.01	0.03	0.00	0.00	0.00	0.00	1.64	0.22
2018	5.18	0.29	22.62	7.62	0.02	0.00	0.00	0.00	0.00			
Mean	21.93	20.57	21.68	5.76	0.39	0.21	0.00	0.00	0.00	0.67	1.90	19.70
Median	5.18	9.02	15.36	7.62	0.02	0.00	0.00	0.00	0.00	0.04	0.76	4.09
			Mean Monthly Bypass+Spill for **Permitted Operations Bypass** (cfs)									
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
2009										1.74	0.47	1.87
2010	14.80	28.25	14.87	15.00	1.39	0.40	0.40	0.40	0.40	1.69	1.19	11.37
2011	9.74	27.40	54.16	1.79	1.48	2.16	0.41	0.40	0.40	0.66	0.40	0.41
2012	1.40	1.28	22.38	11.77	0.40	0.40	0.40	0.40	0.40	0.40	0.43	54.20
2013	3.39	0.51	0.60	0.61	0.40	0.45	0.40	0.40	0.40	0.40	0.40	0.40
2014	0.40	1.40	0.80	5.65	0.40	0.40	0.40	0.40	0.40	0.40	0.40	33.20
2015	0.49	19.80	0.40	0.54	0.40	0.40	0.40	0.40	0.40	0.40	0.40	2.18
2016	19.25	2.45	44.94	0.92	0.40	0.40	0.40	0.40	0.40	2.88	1.04	17.71
2017	103.88	93.97	8.99	8.56	0.40	0.40	0.40	0.40	0.40	0.40	0.55	0.50
2018	2.34	0.57	8.99	7.48	0.40	0.40	0.40	0.40	0.40			
Mean	17.30	19.51	17.35	5.27	0.73	0.58	0.40	0.40	0.40	1.00	0.59	13.54
Median	3.39	2.45	8.99	5.65	0.40	0.40	0.40	0.40	0.40	0.40	0.43	2.18
			Mean Monthly Discharge (cfs) for **Napa River @ St. Helena** (USGS #11456000)									
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
2009										3.25	1.25	9.36
2010	384.8	213.2	181	219.6	35	11.4	3.13	1.08	0.057	13.8	16.6	293.1
2011	103.8	274.6	706	77.1	24.6	21.8	5.95	1.69	0.179	1.81	2.75	3.24
2012	70.1	12.3	339.8	147.5	18.9	4.84	1.49	0.121	0	0.311	93.1	614.7
2013	65.1	21.5	12.6	11.3	3.88	1.7	0.081	0	0	0	0	0.274
2014	1.25	128.2	76.3	111.3	10.4	1.82	0	0	0	0	0.589	357.8
2015	24.5	147.2	19.9	9.83	3.27	1.35	0.011	0	0	0	0.009	26.6
2016	251.2	49.4	498.4	39	12.2	3.05	0.085	0	0	9.32	27.4	232.7
2017	1,232	1,127	131.3	149.4	29.1	8.07	1.27	0	0	0	8.68	3.58
2018	38.5	11	170.2	97	13.1	3.05	1.06	na	na			
Mean	289	284	203	90	24	7.5	2.3	1.1	0.77	4.5	31	187
Median	70.1	128.2	170.2	97.0	13.1	3.1	1.1	0.0	0.0	0.2	5.7	129.7

NOTE: Summer mean monthly discharges of 0.4 cfs reported for the permitted operations represent an average of summer bypass flow releases made by the City in accordance with past accounting methods and likely represent releases made in excess of those required under the terms of its permits (i.e., exceeding actual inflows).

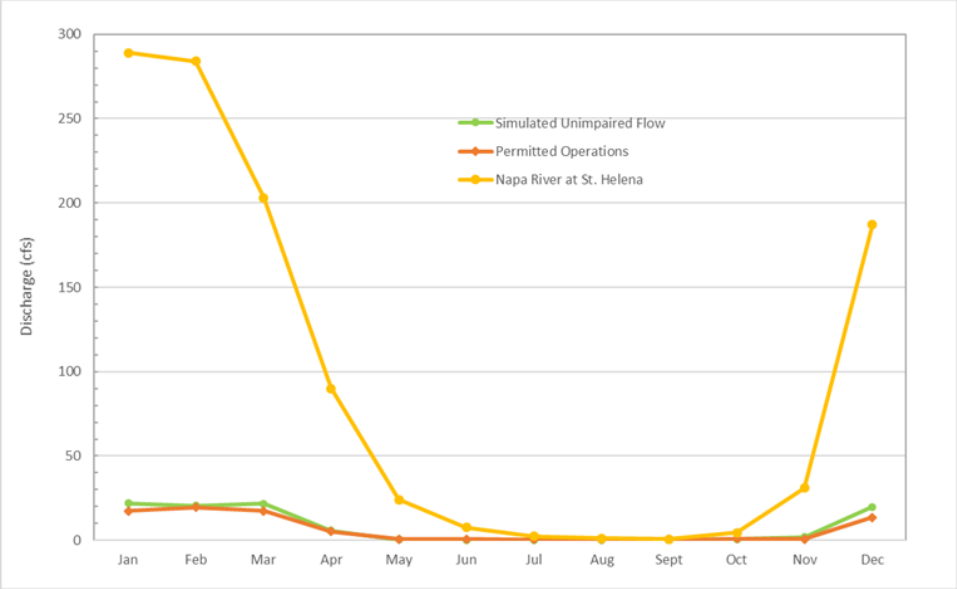


Figure 15. Mean monthly mean discharges for simulated unimpaired and permitted bypass releases at Bell Canyon Reservoir conditions vs. mainstem Napa River at St. Helena, WY 2010-2018.

Summary

In its summary of the 2004 habitat assessment, NCRCD (2005) note that Bell Creek "has been heavily impacted by the construction and maintenance of Bell Reservoir", that sediment transport and hydrology of the downstream reaches have been "completely altered", and that several reaches exhibit streambed incision, which "is likely attributed to some degree" to the influence of the dam. NCRCD (2005) do not, however, provide quantitative data to support these qualitative statements. In fact, NCRCD (2005) also note that Bell Canyon Reservoir restricts anadromy to only a "relatively short portion of the stream historically available to salmonids"; that "spawning habitat was well distributed within the surveyed portion of Bell Creek and does not appear to be a major limiting factor for successful salmonid reproduction"; and that "as a result of managed reservoir releases, the stream maintains flow most of the year". Overall, NCRCD (2005) conclude that Bell Creek below Bell Reservoir is in moderate condition with some areas of high-quality salmonid habitat, primarily in the middle reaches of the surveyed channel.

While we agree with NCRCD (2005) regarding the overall habitat quality of Bell Creek, the results of our analyses do not suggest complete alterations of hydrology or sediment transport. While the existing bypass operations likely inhibit successful adult steelhead passage and spawning in Bell Creek early in the season, Bell Canyon Reservoir fills and spills on a near-annual basis, after which point streamflows in Bell Creek are essentially unimpaired. Moreover, the City's existing water right permits authorize diversions only during a 5-month period of the year, and all inflows are bypassed during the remaining seven months of the year, including most of the spring, all of summer, and the beginning of fall.

Although the reservoir undoubtedly interrupts sediment transport between the upper and lower watershed of Bell Creek, the extent of pre-reservoir sediment transport, and the degree of past and current impediment, are not known. Channel-forming flows occur with near-natural frequencies, and significant coarse sediment storage was observed within the bankfull channel. We agree that streambed incision may be "attributed to some degree" to the

presence of the dam, but we note that channel incision is a common phenomenon in streams of the Napa River watershed and elsewhere in central California coastal streams, and occurs even in streams that do not contain dams. Streamside residential, agricultural, and infrastructure (e.g., roads) development and encroachment, particularly streambank armoring, all contribute to channel incision.

Nevertheless, while spawning habitat is clearly available in Bell Creek, we believe the current extent may in fact limit steelhead reproduction, primary due to the relatively large size of most of observed coarse substrates. It is unclear to what extent, if any, Bell Canyon Reservoir traps spawning-sized gravels. Further investigation of potential sediment transport effects is recommended. Depending on the results of such an investigation, gravel augmentation efforts may be warranted.

While fallen and live hardwood trees extending into the active channel provide geomorphic function and some instream cover in Bell Creek, the overall abundance of woody debris (live or dead) is limited. Increased woody debris would provide additional winter velocity refuge for juvenile steelhead and other native fish species. Although Bell Canyon Reservoir may interrupt the downstream transport of some woody debris, streamside wood availability appears sufficient for substantial local recruitment, and removal of woody debris by landowners and infrastructure managers may be the primary reason for the observed paucity of woody debris, as it is on many streams.

Bypass Flow Recommendations

Goals and Objectives

The City's primary goal for this FBP is to comply with its existing water rights permits, and the provisions of Fish and Game Code section 5937, while ensuring a safe and reliable water supply for the resident of the City of St. Helena. The City's secondary goal is to contribute, to the extent feasible, to habitat enhancement and steelhead recovery in the Bell Creek watershed.

To realize these goals, the following specific objectives are established for this FBP:

1. Update existing measuring and reporting methods to a system that meets the requirements of, and is consistent with, Water Code sections 1840 and 5100, and California Code of Regulations, title 23, sections 931 *et seq.* (Progress on this objective is described in a separate document)

2. Allow sufficient water to pass over, around or through Bell Canyon Reservoir dam, to keep in good condition any fish that may be planted or exist below the dam, as defined by the flow prescriptions presented in this FBP.

3. Investigate and implement, to the extent warranted and feasible, physical habitat enhancements outlined as part of the adaptive management component of this FBP.

It is important to note that the City does not plan to formally request changes to the conditions of its existing water right permits, including the existing bypass requirements contained therein. As such, instream flow recommendations developed for this FBP are either equal to, or higher than, the existing bypass requirements for any given day. In other words, the existing bypass terms form the base upon which higher bypass flows are recommended where appropriate, based on the findings of the analyses conducted in support of this FBP.

It is also important to note that small agricultural and municipal reservoirs in California are typically required to *bypass* a certain amount of water, meaning that a portion (i.e., 0-100%) of actual inflows at any given time must be passed through the reservoir to the downstream channel. Small reservoirs like Bell Canyon Reservoir are typically not required to release flows *in excess* of inflows at any given time (e.g., outside the permitted diversion season). While larger water storage and hydroelectric reservoirs are often required to provide summer flow releases in excess of inflows, the underlying justification for those requirements are typically based in the fact that most large reservoirs have eliminated anadromous salmonid access to a significant quantity (i.e., many miles) of upper watershed habitat where perennial summer flows were historically available to fish, and that the reaches immediately downstream of the reservoir have therefore become surrogate headwaters where perennial flows should be provided regardless of reservoir inflows. As described above, Bell Canyon Reservoir, like many other small reservoirs in California, was constructed at or near the historic limit of anadromy, and the permitted bypass of all inflows during the April 16-November 14 period provide hydrologic conditions similar or identical to those that would be present in the absence of the reservoir. As such, the hydrologic effects of City's operations at Bell Canyon Reservoir are limited to the 5-month period of November 15-April 15. The bypass flow recommendations developed for this FBP are specific to this period of potential effects and are intended to avoid or minimize adverse effects of reservoir operations during the permitted diversions season.

Furthermore, we note that it is our professional opinion that a full and spilling reservoir is desirable both for fisheries management and for water supply. A full and spilling reservoir provides essentially unimpaired[6] streamflow conditions downstream of the reservoir (minus limited direct winter diversions of up to 1 cfs) while also providing the City with a full water supply heading into the 7-month period of April 16-November 14 when diversions are not permitted yet water demand is highest. Given that Bell Canyon Reservoir fills and spills during all but the driest years (see below), the bypass flow recommendations presented below are aimed at filling the reservoir as efficiently as possible while providing for the instream flow needs of steelhead and other native species during the initial filling period.

Lastly, we note that numerous land management activities affect fish habitat quality in streams, including Bell Creek. Many of these activities occur outside the control or jurisdiction of the City and are unrelated to the City's operation of Bell Canyon Reservoir. While the City will consider partnerships in the implementation of potential future habitat enhancement projects in Bell Creek, the City does not intend to actively pursue habitat enhancement activities on private or non-City owned properties.

Biological Considerations

As described, we considered CCC steelhead the target species for purposes of developing bypass flow recommendations based on the reasonable assumption that instream hydrologic conditions suitable for steelhead are also, by and large, suitable for other coevolved native fish species.

Multiple life stages of steelhead may be present at any given time, and each life stage has different optimum flow levels. Therefore, the flow target at any given time would be the target for the life stage with the highest flow requirement present at that time. For example, winter rearing of juveniles coincides with the adult migration season, and the higher flow requirement for adult passage is recommended for that period when available.

---

6 The term "unimpaired", as used herein, refers to inflows to Bell Canyon Reservoir, i.e., streamflows available in Bell Creek prior to the City's exercise of it permitted water right diversion. The City does not have control over other authorized or unauthorized diversions that may be occurring upstream of Bell Canyon Reservoir, and such upstream diversions are not considered in this analysis.

Although no thorough investigation of the adult steelhead run timing has been conducted in the Napa River watershed, several reports specific to the watershed (e.g., NCRCD, 2017; Stillwater Sciences and Dietrich, 2002) suggest that peak adult spawning migration occurs in January through March. This is consistent with the general spawning migration timing for San Francisco Bay streams (e.g., Leidy, 2007) and many central California systems (Moyle, 2002). In their seminal 9-year study of steelhead in Waddell Creek, Shapovalov and Taft (1954) noted that less than 5% of the total yearly migration run of adult steelhead occurred prior to December 23 in Waddell Creek, South Fork of the Eel River, and the Mad River. Closer to the Napa River, the Marin Municipal Water District (Ettlinger et al., 2010) conducts yearly salmon and steelhead spawner surveys on Lagunitas Creek, Marin County. **Figure 16** shows new steelhead redd observations in Lagunitas Creek during the 2004-2005 through 2009-2010 monitoring seasons, as well as the mean steelhead redd observations for the entire monitoring period of 2001-2002 through 2009-2010. These data also show that the vast majority of the steelhead run occurs after December, and that even the minimal portion of the overall run that occurs in December, does so at the end of that month. In fact, the data provided in Ettlinger et al. (2010) suggest that the majority of the adult steelhead run occurs in February across a range of different water type years. Steelhead spawning and egg incubation essentially occur concurrently with the migration season. For the purposes of this FBP, we assumed an adult migration season of December 15 through March 31. As described above, an adult steelhead migration target flow need of 11 cfs has been identified in this analysis.

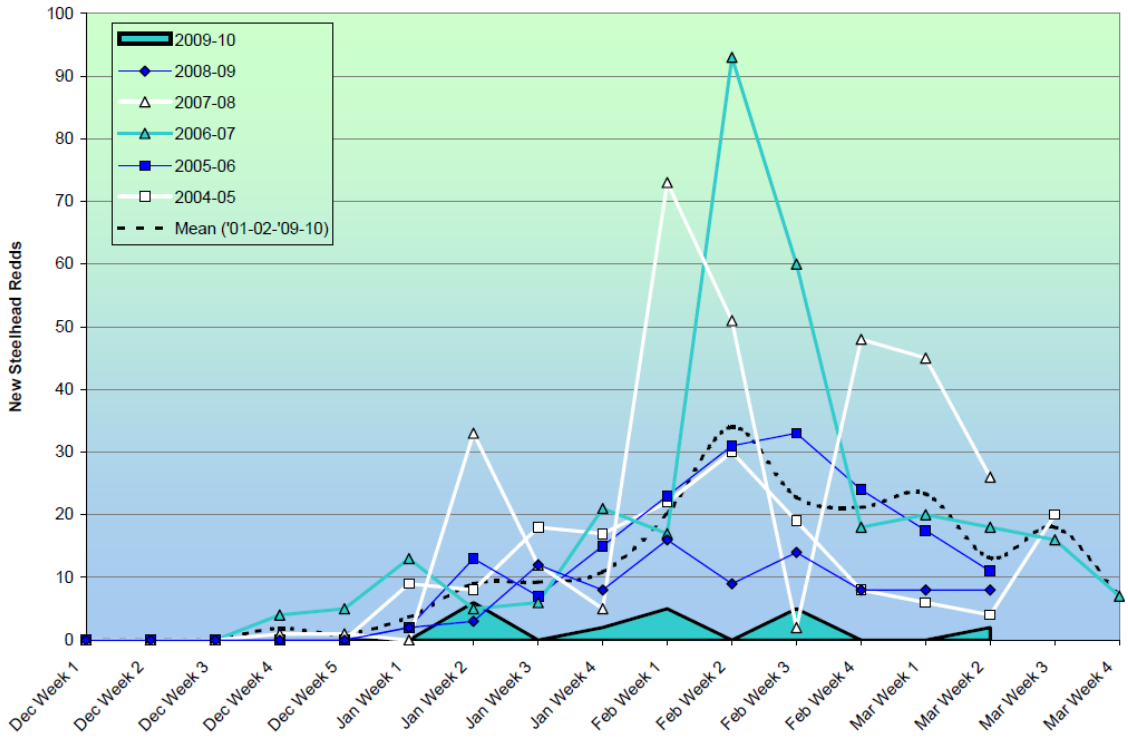


Figure 16: Timing of steelhead spawning activity in the Lagunitas Creek study area (Ettlinger *et al.*, 2010)

Between the November 15 beginning of the permitted diversion season and the December 15 onset of the adult steelhead migration season, fisheries resources present in Bell Creek include rearing juvenile steelhead and non-salmonid native species such sculpins and roach that have survived the preceding summer low-flow and elevated temperature conditions. Depending on the onset of seasonal rains, this period may be characterized by continued

low-flow conditions or gradual to rapid increase in natural streamflow conditions. Natural increases in streamflow during this period reduce stress and increase feeding opportunities.

Beginning in April, the steelhead smolt outmigration season typically begins. Shapovalov and Taft (1954) found that the spring downstream migrations of different steelhead age classes in Waddell Creek had distinctly separate peaks with most age 2 and 3 juveniles migrating first during April and May, and age 1 fish migrating later, primarily during May and into June. As described above, the estimated smolt outmigration passage flow recommendation Bell Creek is 6.0 cfs.

Proposed Bypass Schedule

Based on instream flow requirements developed for Bell Creek in this investigation, the known life stage seasonality of CCC steelhead, and the City's existing permitted bypass requirements, we recommended the City implement the following proposed bypass schedule:

Between April 16 and November 15:

***All inflows** will be bypassed.*

This period falls outside the City's authorized diversion season as specified under water rights Permits 9157 and 14810.

Between November 16 and November 30:

*The City will **bypass 2.0 cfs or all inflows, whichever is less**, and divert, store, and use any remaining inflows in accordance with the rates and quantities allowed under the water rights confirmed in Permits 9157 and 14810.*

Water rights Permits 9157 and 14810 do not specify a bypass flow requirement for this period. Our recommendation ensures that moderate increases over summer baseflows are bypassed while also providing the City the opportunity to divert and store early season runoff events prior to the onset of the adult steelhead migration and spawning season.

Between December 1 and December 14:

*The City will **bypass 4.0 cfs or all inflows, whichever is less**, and divert, store, and use any remaining inflows in accordance with the rates and quantities allowed under the water rights confirmed in Permits 9157 and 14810.*

This recommendation is based primarily on the existing permitted bypass requirement. Adult steelhead migration is unlikely to occur in early December, and the recommended bypass flow will increase downstream flows and contribute to Chinook salmon migration flows in the mainstem Napa River while also allowing for early season increases in reservoir storage to offset higher bypass flow releases provided in later in the season, as described below.

Between December 15 and March 31:

Inflow ≤ 4.0 cfs: *When inflow is less than or equal to 4.0 cfs,* ***all inflows*** *will be bypassed.*

This recommendation is aimed at maintaining unimpaired (i.e., natural) winter baseflow conditions.

Inflow > 4.0 cfs and ≤ 9.0 cfs: *When inflow is greater than 4.0 cfs and less than or equal to 9.0 cfs, the City will* ***bypass 4.0 cfs*** *and divert, store, and use any remaining inflows in accordance with the rates and quantities allowed under the water rights confirmed in Permits 9157 and 14810.*

As inflows to the reservoir begin to increase above the winter base flow recommendation of 4.0 cfs, but are likely insufficient to allow for unimpeded adult steelhead migration in Bell Creek, the City will maintain winter base flow conditions and divert up to 5 cfs of additional inflow.

Inflow > 9.0 cfs and ≤ 11.0 cfs: *When inflow is greater than 9.0 cfs and less than or equal to 11.0 cfs, the City will directly divert inflow, within the limitations of its direct diversion right under Permits 9157 and 14810 (i.e.,* ***up to the 1.0 cfs direct diversion*** *right) and* ***bypass the remaining inflow****.*

Based on the results of the critical riffle fish passage analysis conducted in support of this FBP, we recommend a minimum adult steelhead bypass flow of 11 cfs. However, recognizing that adult steelhead are able to negotiate shallow riffles at less-than-ideal depths, and that increasing discharges provide migration cues for adult steelhead, the City will allow increasing inflows to be bypassed to Bell Creek while only diverting under its direct diversion right of up to 1 cfs. For example, when inflows are 9.4 cfs, the City may directly divert up to 0.4 cfs and will bypass a minimum of 9 cfs. When inflows are 10.6 cfs, for example, the City may directly divert up to 1.0 cfs and will bypass a minimum of 9.6 cfs.

Inflow > 11.0 cfs: *When inflow is greater than 11.0 cfs, the City will* ***bypass 11.0 cfs*** *and divert, store, and use any remaining inflows in accordance with the rates and quantities allowed under the water rights confirmed in Permits 9157 and 14810.*

When inflows reach and exceed the adult steelhead passage flow recommendation of 11 cfs, that instream flow requirement will be maintained downstream of the reservoir while flows in excess of the adult passage and spawning needs are diverted and stored.

Between April 1 and April 15:

The City will ***bypass 6.0 cfs or all inflows, whichever is less****, and divert, store, and use any remaining inflows in accordance with the rates and quantities allowed under the water rights confirmed in Permits 9157 and 14810.*

At the tail end of the adult steelhead migration and spawning season, the recommended bypass flow is reduced to the identified steelhead smolt passage flow need for the remainder of the authorized diversion season, at the end of which all inflows will again be bypassed.

Anticipated Effects

The predicted hydrologic and fisheries habitat effects of the proposed FBP schedule are analyzed and discussed below. For reference, we present comparisons of expected conditions as a result of operations under the proposed schedule to unimpaired conditions and existing permitted operational conditions.

Simulated 2010-2018 Hydrographs

Figure 17 provides an overall side-by-side comparison of the City's use (represented by actual use), bypass flows, and reservoir spill volumes for simulated water years (WY) 2010 through 2018 in accordance with current permit terms and operations under the proposed FBP. For both operational scenarios, outflows from Bell Canyon Reservoir in the form of bypass flows or spills far exceeded the City's water use during eight of the nine simulated years. Only during WY 2014, one of the driest water years on record in central California, would the City's use have exceeded simulated outflows under existing permitted operations, but not under proposed FBP operations. Most notably, **Figure 17** shows that Bell Canyon Reservoir would have filled and spilled during all simulated years except WY 2014 when the higher bypass flow rates of the proposed FBP would have prevented complete filling of the reservoir. The fact that the reservoir would have filled and spilled during all simulated years under existing operations, and under all but the driest years under proposed FBP operations, provides a clear indication of the small size and storage capacity of Bell Canyon Reservoir relative to unimpaired flow volumes in Bell Creek. The primary difference between the two operational scenarios is whether the outflows are provided through managed bypass releases or passively spilled over the dam. Under permitted operations, the City typically provides lower bypass flows than under the proposed FBP, resulting in more rapid filling and subsequent spilling of the reservoir. In contrast, the proposed FBP provides for higher managed bypass releases during much of the diversion season, resulting in a slower filling and subsequent spilling of the reservoir. While the total annual volumes provided to Bell Creek downstream of the reservoir (i.e., bypass releases and spill volumes combined) are virtually identical under both bypass scenarios (**Figure 17**), the proposed FBP would ensure that ecologically-appropriate streamflows are present below the reservoir at all times during the permitted diversion season.

Figures 18 through 26 depict streamflows downstream of Bell Canyon Reservoir under currently permitted operations and proposed FBP operations, plotted against simulated unimpaired hydrographs for water years (WY) 2010 through 2018. These hydrographs further convey the slight but important differences between existing bypass requirements and the proposed FBP. For example, during an above-average water year such as WY 2016 (**Figure 24**), operations in accordance with current permit terms[7] resulted in virtually all runoff from the first series of moderate storm events in December and early January being stored in Bell Canyon Reservoir while releasing the permitted bypass of 4 cfs. By the middle of January, the reservoir would have filled and spilled during the first significant (> 50 cfs) runoff event of the season. In contrast, proposed FBP operations would have also provided 4 cfs of bypass during the first half of December prior to the onset of the adult steelhead migration season, but starting December 15, downstream flows of up to the 11 cfs necessary for adult steelhead passage would have been released during each storm event prior to the middle of January, at which point the reservoir would have filled and spilled at almost the same time as under permitted operations (i.e., the mid-January runoff event was large enough to fill the reservoir regardless of differences in storage up to that point). From mid-

7 Note that the City's existing water right permits do not specify a bypass requirement for the first two weeks of the diversion season (Nov 15-Nov 30). Although the City has been providing voluntary bypass flows during that period, the permitted operations scenario in this analysis is defined as operations in accordance with permit requirements (i.e., no bypass Nov 15 through Nov 30).

January onward, both operational scenarios resulted in essentially unimpaired streamflows below the reservoir for the remainder of the diversion season and beyond (**Figure 24**).

The reservoir would have filled and spilled by mid-January under both operational scenarios in seven of the nine years of the simulated 2010-2018 hydrologic record used in this analysis. The exceptions are WY 2012 (**Figure 20**), a year during which only three minor (< 50 cfs) runoff events occurred prior to mid-March, at which point the reservoir filled and spilled within days of the onset of the first significant event, and WY 2014 (**Figure 22**), a critically dry year in which the reservoir did not fill until early April under permitted operations, and not at all under proposed FBP operations. The operational differences during WY 2014 are of note as only three natural adult migration opportunities (i.e., storms) occurred during this drought year. Under permitted operations, the City would have bypassed 4 cfs during the February event and 2 cfs during the March event, potentially preventing any adult passage in Bell Creek, before filling and spilling in early April at the tail end of the typical adult steelhead migration and spawning season. In contrast, operations under the FBP would have provided suitable passage flows during each of the rare migration opportunities occurring that year.

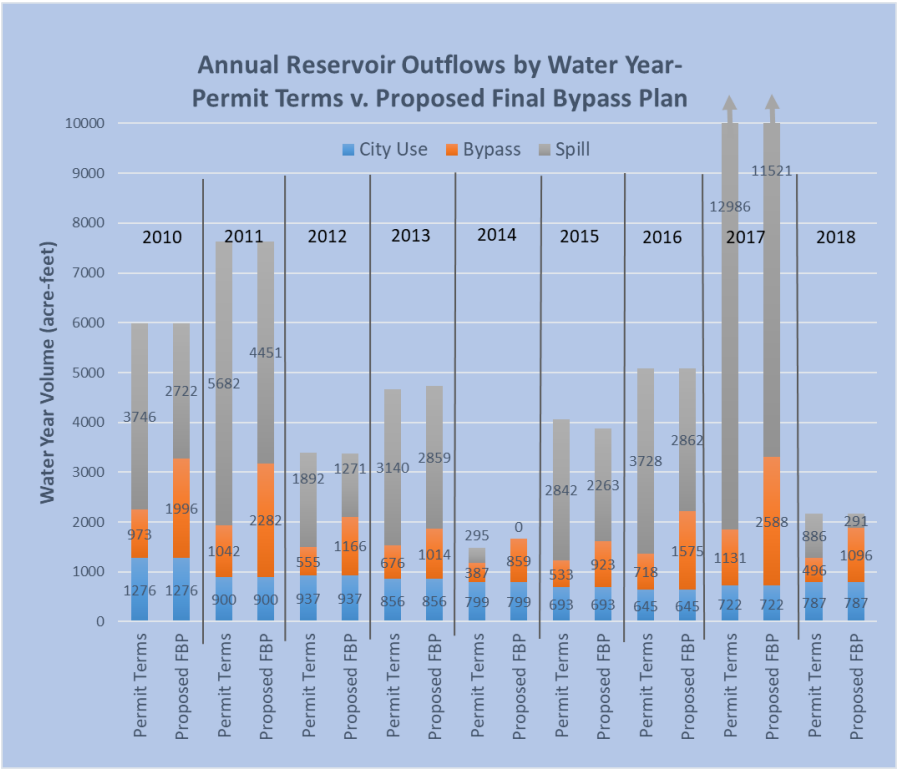


Figure 17: Annual reservoir water outflows, by water year, under permitted and proposed FBP operations

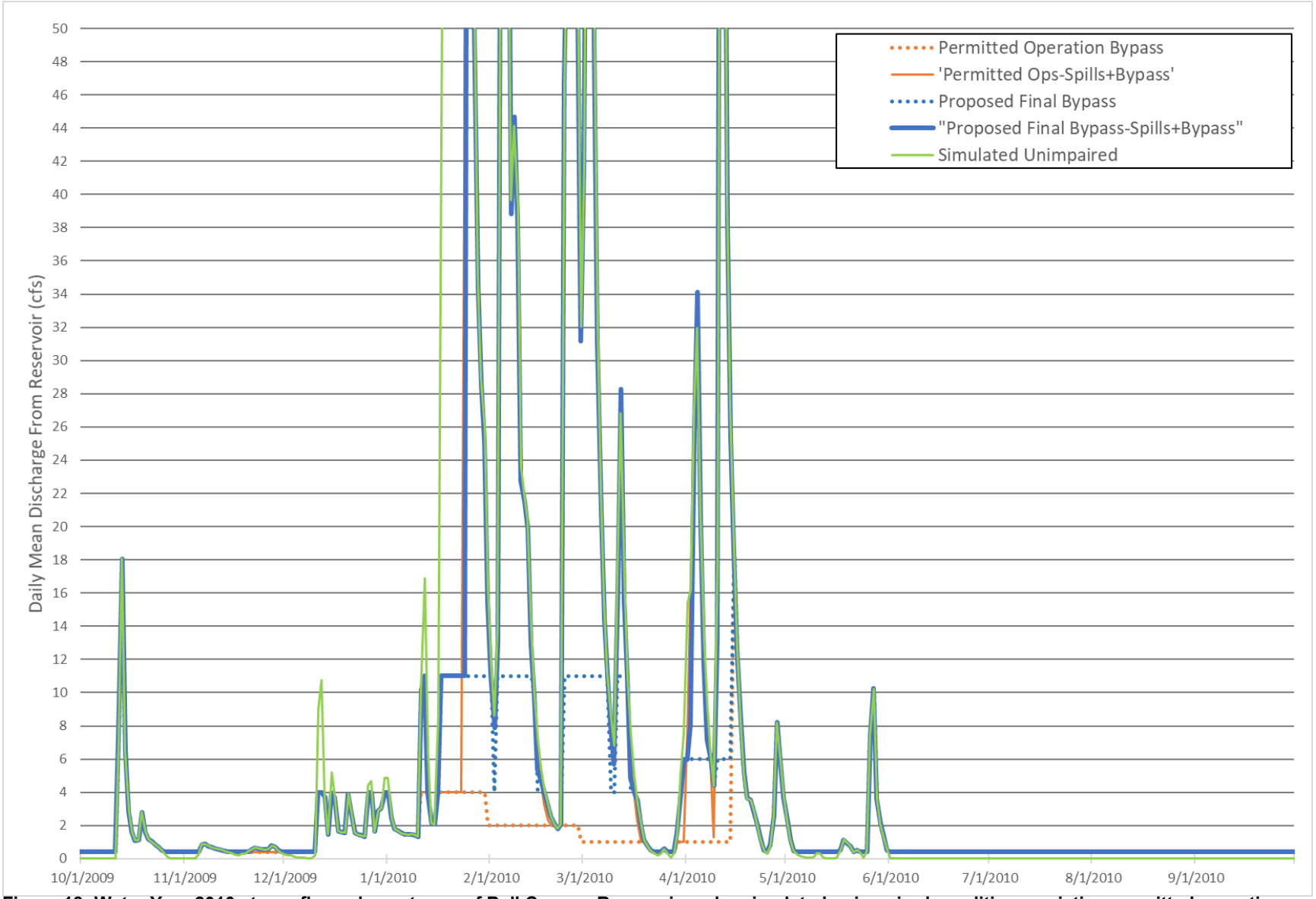


Figure 18: Water Year 2010 streamflows downstream of Bell Canyon Reservoir under simulated unimpaired conditions, existing permitted operations (permitted bypass and permitted bypass+spills), and proposed FBP operations (proposed bypass and proposed bypass+spills).

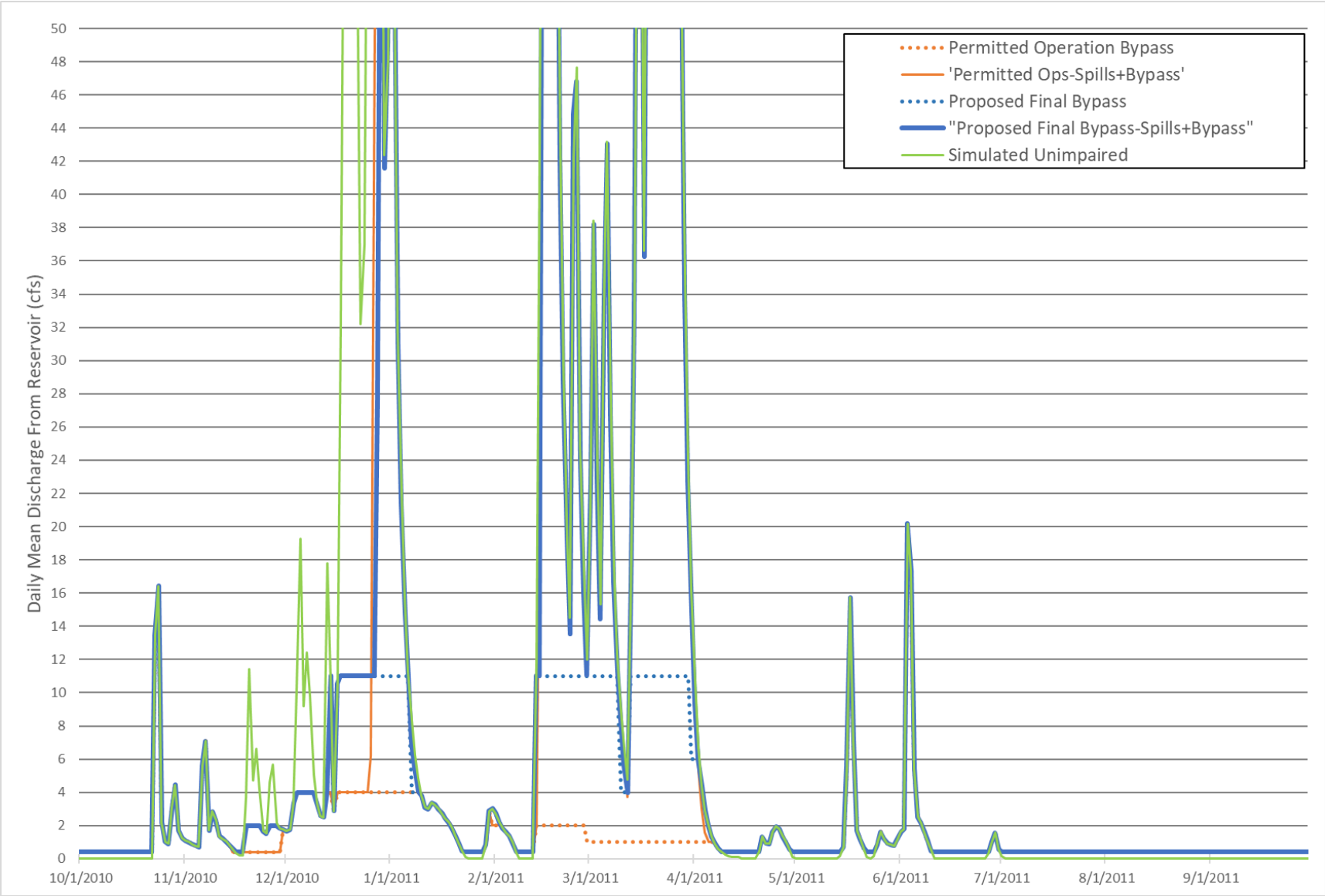


Figure 19: Water Year 2011 streamflows downstream of Bell Canyon Reservoir under simulated unimpaired conditions, existing permitted operations (permitted bypass and permitted bypass+spills), and proposed FBP operations (proposed bypass and proposed bypass+spills).

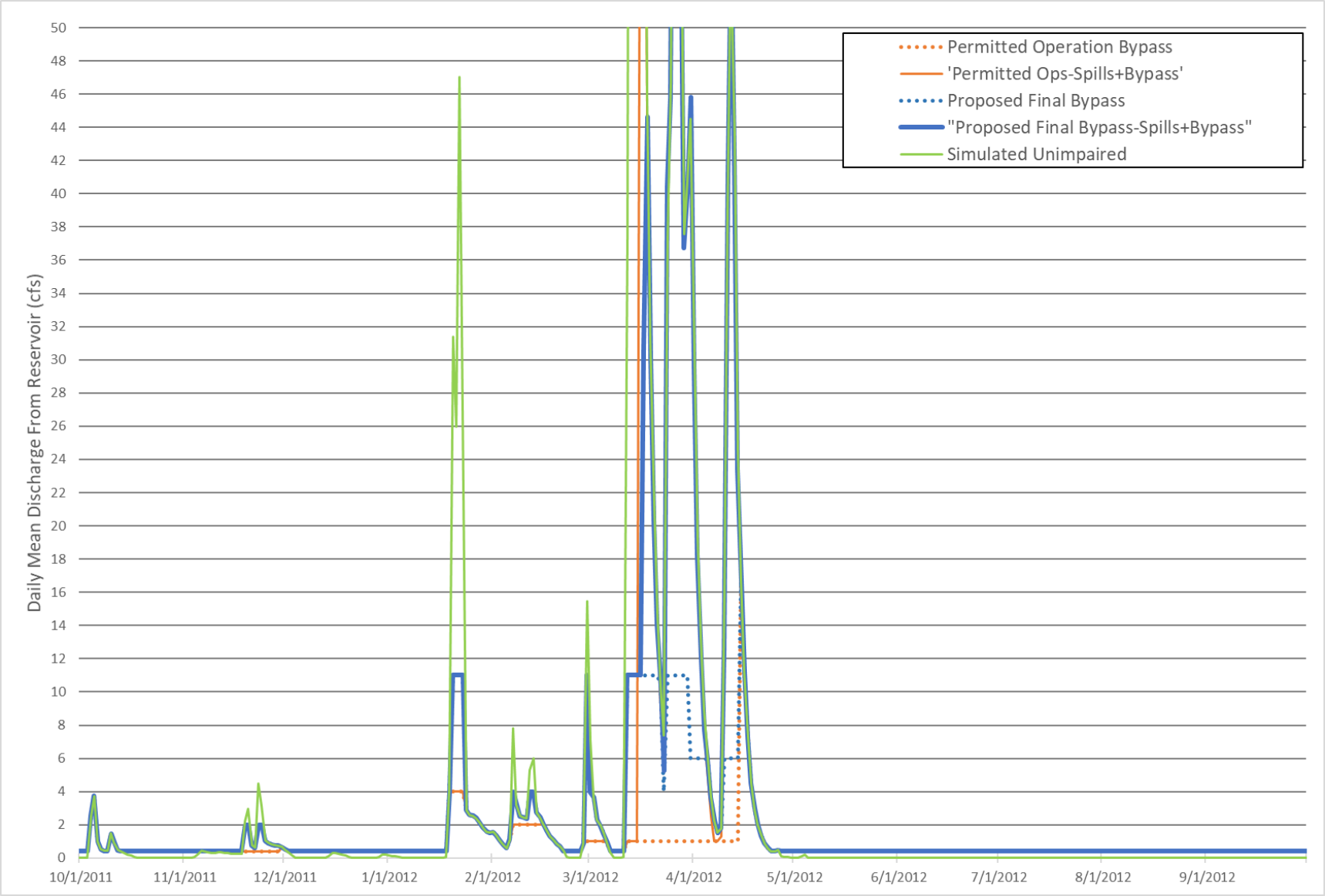


Figure 20: Water Year 2012 streamflows downstream of Bell Canyon Reservoir under simulated unimpaired conditions, existing permitted operations (permitted bypass and permitted bypass+spills), and proposed FBP operations (proposed bypass and proposed bypass+spills).

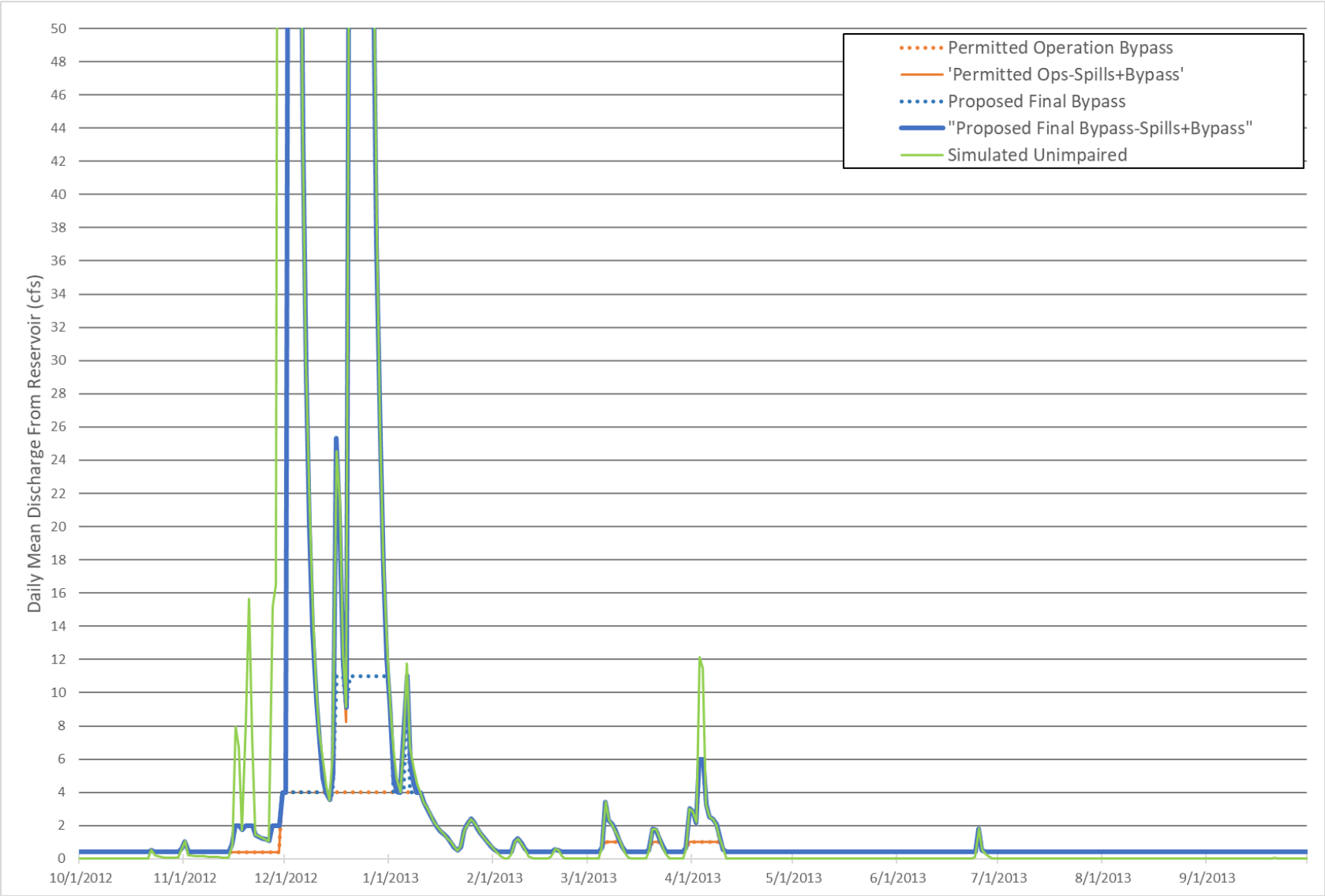


Figure 21: Water Year 2013 streamflows downstream of Bell Canyon Reservoir under simulated unimpaired conditions, existing permitted operations (permitted bypass and permitted bypass+spills), and proposed FBP operations (proposed bypass and proposed bypass+spills).

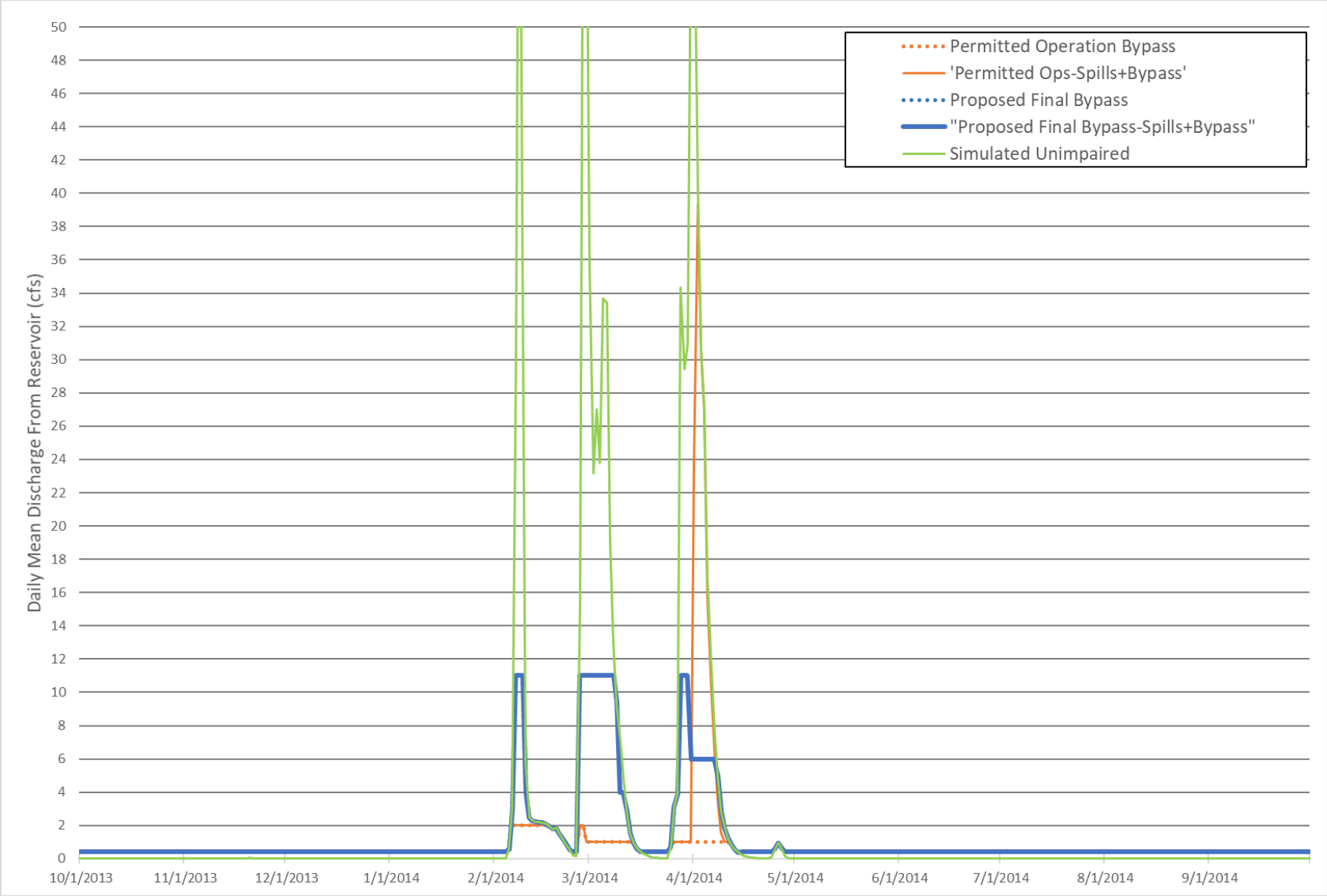


Figure 22: Water Year 2014 streamflows downstream of Bell Canyon Reservoir under simulated unimpaired conditions, existing permitted operations (permitted bypass and permitted bypass+spills), and proposed FBP operations (proposed bypass and proposed bypass+spills).

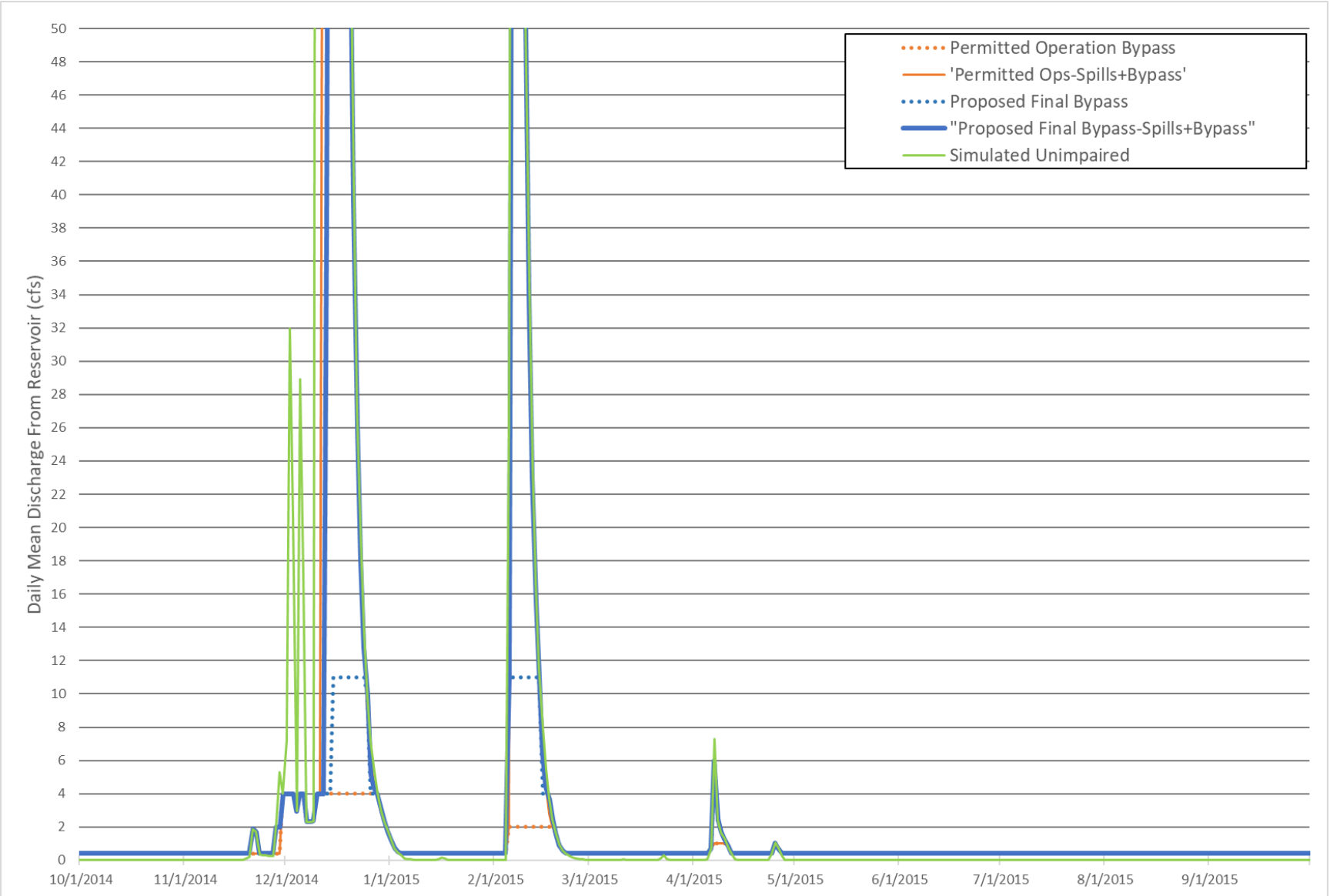


Figure 23: Water Year 2015 streamflows downstream of Bell Canyon Reservoir under simulated unimpaired conditions, existing permitted operations (permitted bypass and permitted bypass+spills), and proposed FBP operations (proposed bypass and proposed bypass+spills).

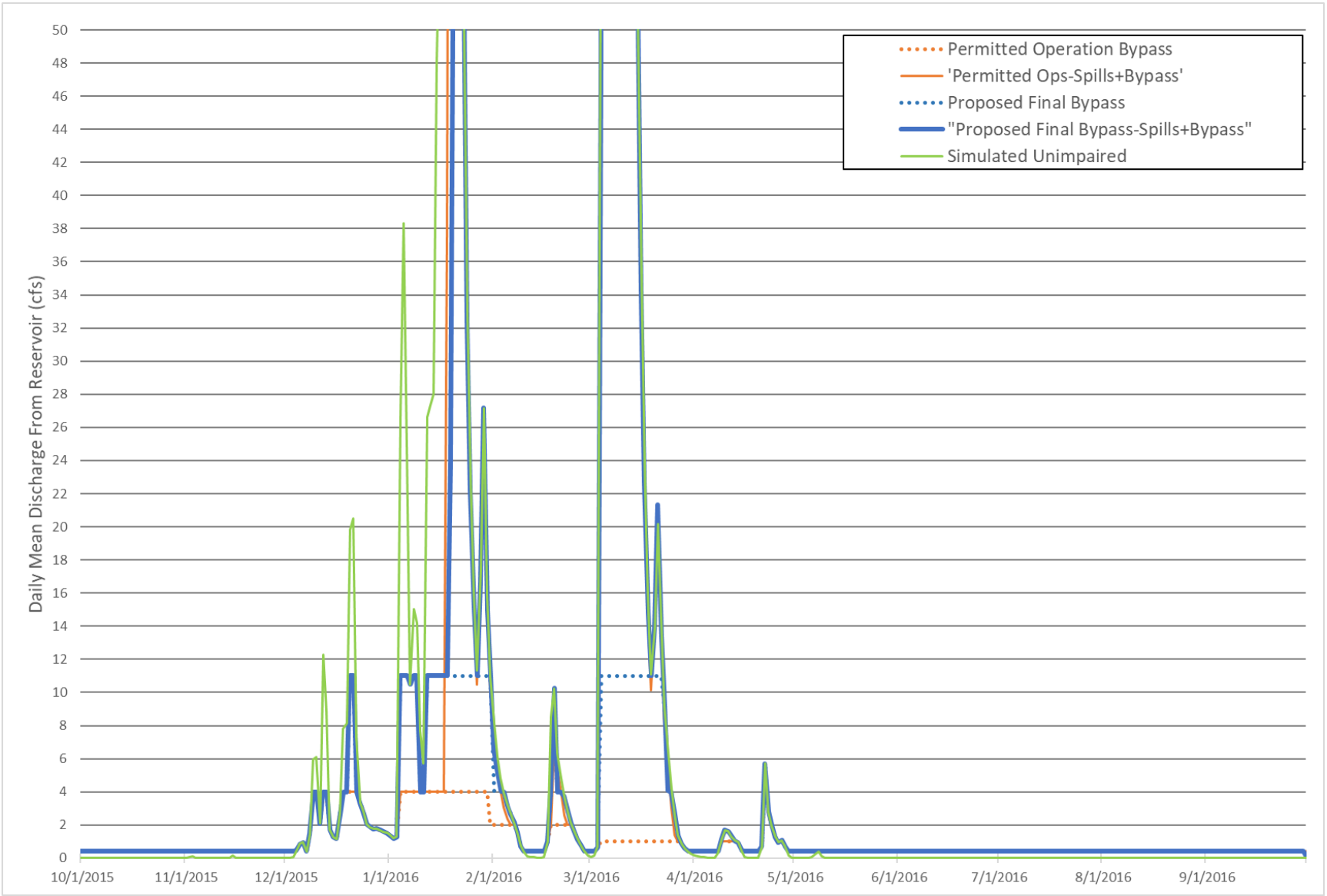


Figure 24: Water Year 2016 streamflows downstream of Bell Canyon Reservoir under simulated unimpaired conditions, existing permitted operations (permitted bypass and permitted bypass+spills), and proposed FBP operations (proposed bypass and proposed bypass+spills).

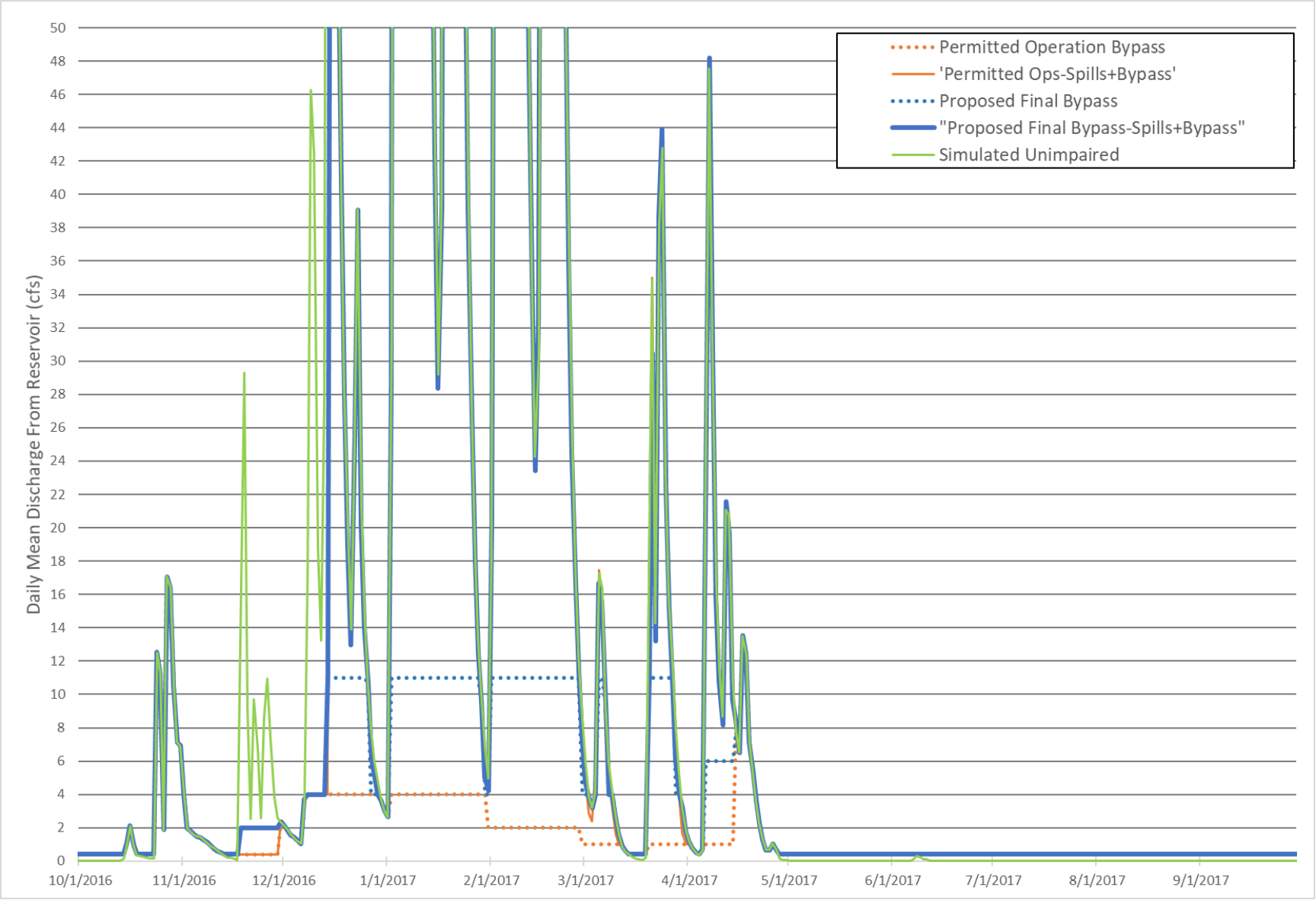


Figure 25: Water Year 2017 streamflows downstream of Bell Canyon Reservoir under simulated unimpaired conditions, existing permitted operations (permitted bypass and permitted bypass+spills), and proposed FBP operations (proposed bypass and proposed bypass+spills).

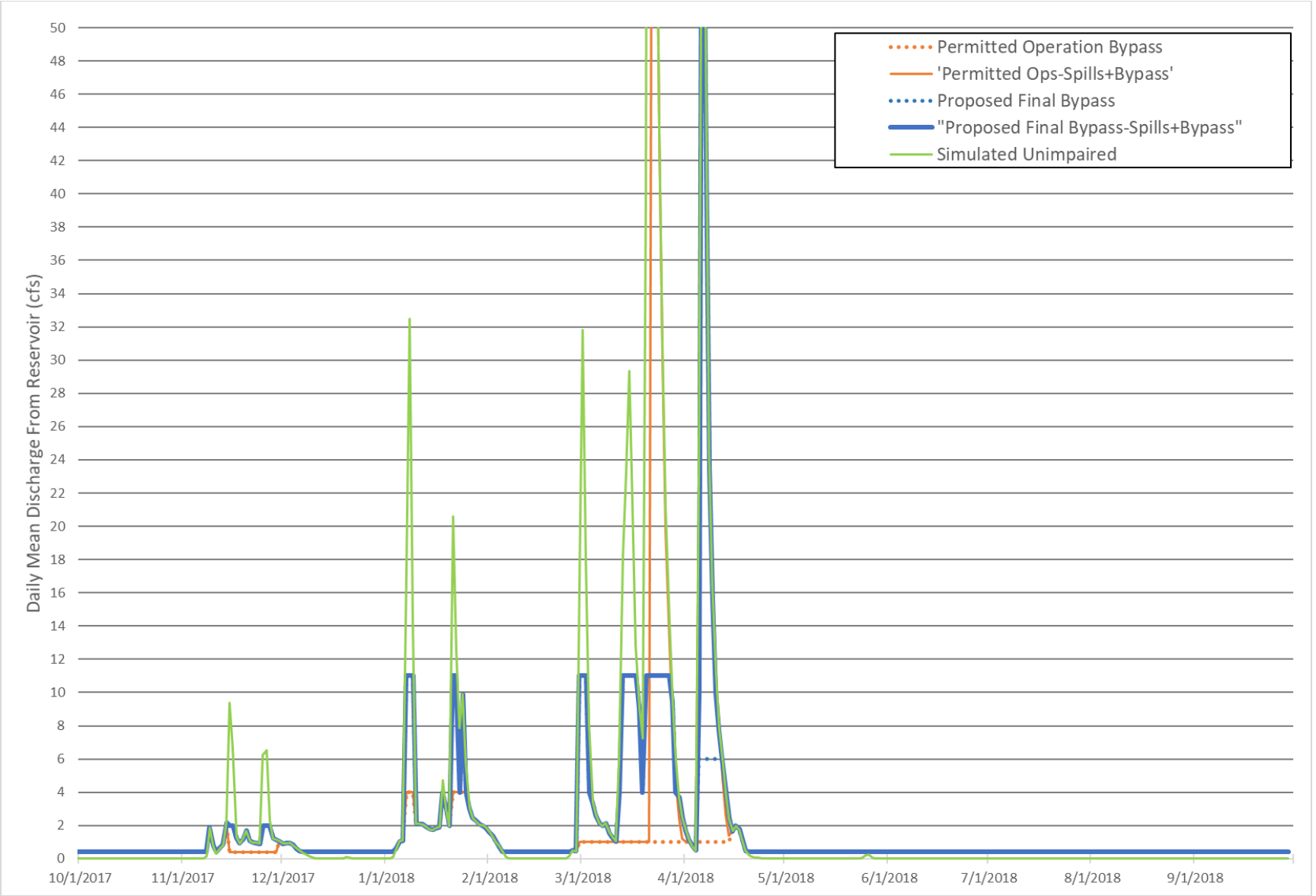


Figure 26: Water Year 2018 streamflows downstream of Bell Canyon Reservoir under simulated unimpaired conditions, existing permitted operations (permitted bypass and permitted bypass+spills), and proposed FBP operations (proposed bypass and proposed bypass+spills).

Instream Habitat

The proposed FBP regime ensures that appropriate adult steelhead migration flows are maintained downstream of the reservoir at all times when such conditions would naturally be present. These flows are also deemed sufficient to support steelhead spawning, especially considering that these flow recommendations were developed at the representative critical (i.e., very shallow) riffles and water depths at preferred spawning sites such as pool tail-outs would therefore be even greater at these flows.

Results of the wetted perimeter analysis indicate that at the recommended winter base bypass level of 4.0 cfs, the extent of wetted channel widths at the two evaluation sites at would be reduced by less than 10% compared to the wetted perimeter at the adult migration and spawning flow of 11 cfs (**Table 6** and **Figure 27**). As such, potential spawning sites are expected to remain sufficiently wetted to support egg incubation under the FBP at all times when unimpaired inflows would provide such conditions naturally.

The proposed FBP regime also ensures that appropriate steelhead smolt out-migration flows are maintained downstream of the reservoir at all times when such conditions would naturally be present. After the April 15 end of the diversion season, all inflows will be bypassed and fish habitat conditions in Bell Creek below the reservoir will be maintained consistent with unimpaired conditions.

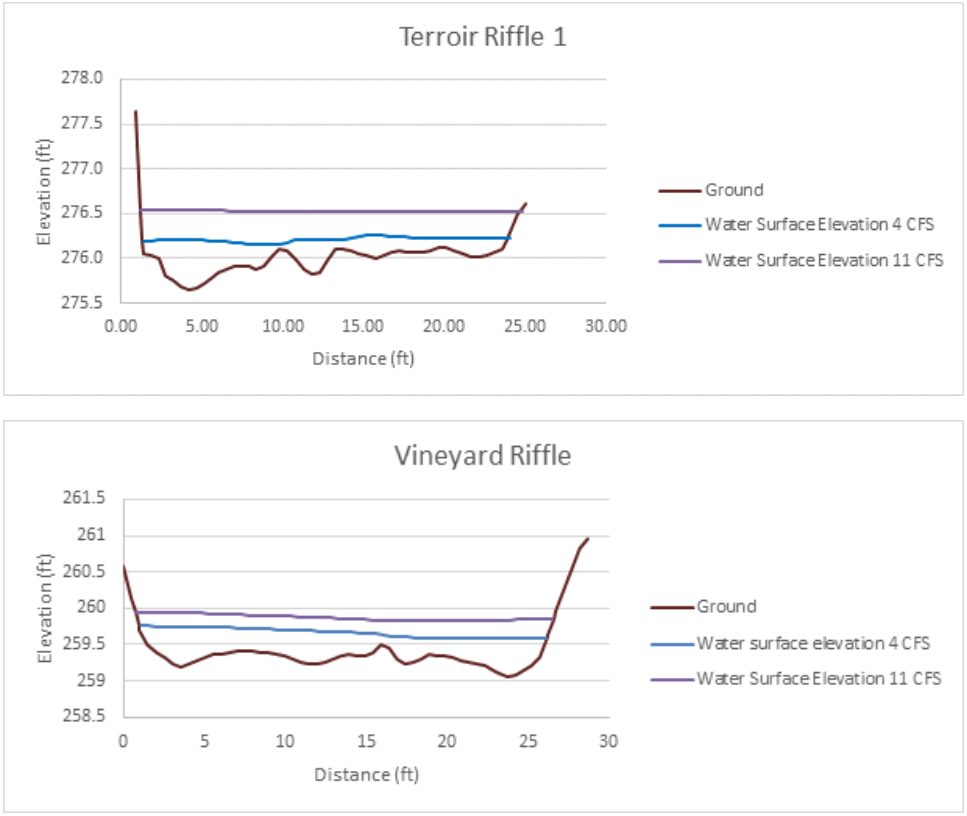


Figure 27. Surface water elevations at two evaluation sites on Bell Creek at discharges of 11 cfs and 4 cfs.

Table 6. Wetter perimeter at two evaluation sites on Bell Creek at discharges of 11 cfs and 4 cfs

Discharge (cfs)	Wetted Perimeter (ft)	
	Terroir	Vineyard
11.0	25.1	27.6
4.0	22.7	26.3

Flow Frequency

The proposed FBP schedule was analyzed in the context of the flow frequency analysis descried above. **Table 7** summarizes the number of flow events exceeding 100 cfs under three operational scenarios (i.e., unimpaired, permitted bypass, and proposed FBP operations) for WYs 2010 to 2018. As expected, the proposed FBP would not affect the frequency of peak flow events during relatively wet years (e.g., 2011, 2013, 2017), but may reduce the number of such events during moderate and drier water years (e.g., 2015 and 2018). Overall, operations under the proposed FBP are expected to reduce the frequency of peak events over the 9-year period of simulation to 16, about 73% of the number (22) of such flows under unimpaired conditions and about 89% of the number (18) of such flows under existing permitted operations. These results reiterate the previous findings that the higher bypass flows provided by the proposed FBP tend to maintain winter reservoir elevations at somewhat lower levels than under existing permitted operations, thereby reducing the likelihood of spill events that cause flows-above-threshold. Nevertheless, these results suggest that although the proposed FBP would eliminate some peak flow events, such events still occur with sufficient frequency to maintaining geomorphic processes downstream.

Table 7. Number of flow events exceeding 100 cfs in WYs 2010 through 2018 under unimpaired, existing permitted operations, and proposed FBP operations of Bell Canyon Reservoir

Water Year	Unimpaired Flow	Permitted Bypass	Proposed FBP
2010	2	1	0
2011	3	3	3
2012	2	1	1
2013	2	2	2
2014	0	0	0
2015	3	2	2
2016	3	3	2
2017	6	6	6
2018	1	0	0
Total	**22**	**18**	**16**

Relative Contribution to Napa River

An analysis of the relative contribution of unimpaired Bell Creek flows to mainstem Napa River flows is presented above in the *Assessment Results* section. Comparison of simulated releases under proposed FBP operations to the above results indicates that, on average, the proposed FBP will results in higher monthly mean contributions to the Napa River than existing permitted operations. However, since even unimpaired Bell Creek flows provide only relatively minor contributions to the Napa River, particularly during the winter and spring wet season, neither the City's diversions nor the proposed increases in bypass flows appear to significantly affect Napa River flows (**Figure 28** and **Table 8**). As such, the operation of Bell Canyon Reservoir pursuant to the proposed bypass regime is unlikely to adversely affect fisheries resources, including Chinook salmon, in the mainstem Napa River.

Table 8. Mean monthly discharges for simulated unimpaired, permitted bypass releases, and proposed FBP operations at Bell Canyon Reservoir, and in the mainstem Napa River at St. Helena, WY 2010-2018.

			Mean Monthly Discharge, NAM-**Simulated Unimpaired Flow** to Reservoir (cfs)									
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
2009										1.53	0.45	2.24
2010	37.53	28.48	15.36	15.68	1.26	0.02	0.00	0.00	0.00	1.40	2.64	30.56
2011	9.82	28.31	53.80	1.95	1.27	1.94	0.02	0.00	0.00	0.41	0.76	0.11
2012	4.90	1.79	35.36	11.94	0.02	0.00	0.00	0.00	0.00	0.04	6.73	65.20
2013	3.60	0.27	0.63	1.46	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00
2014	0.00	9.02	12.90	8.81	0.00	0.00	0.00	0.00	0.00	0.00	0.43	47.32
2015	0.17	21.16	0.02	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.02	4.09
2016	33.76	3.06	44.71	0.82	0.03	0.00	0.00	0.00	0.00	2.66	4.40	27.56
2017	102.38	92.72	9.68	8.73	0.01	0.03	0.00	0.00	0.00	0.00	1.64	0.22
2018	5.18	0.29	22.62	7.62	0.02	0.00	0.00	0.00	0.00			
Mean	21.93	20.57	21.68	5.76	0.39	0.21	0.00	0.00	0.00	0.67	1.90	19.70
Median	5.18	9.02	15.36	7.62	0.02	0.00	0.00	0.00	0.00	0.04	0.76	4.09
			Mean Monthly Bypass+Spill for **Permitted Operations Bypass** (cfs)									
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
2009										1.74	0.47	1.87
2010	14.80	28.25	14.87	15.00	1.39	0.40	0.40	0.40	0.40	1.69	1.19	11.37
2011	9.74	27.40	54.16	1.79	1.48	2.16	0.41	0.40	0.40	0.66	0.40	0.41
2012	1.40	1.28	22.38	11.77	0.40	0.40	0.40	0.40	0.40	0.40	0.43	54.20
2013	3.39	0.51	0.60	0.61	0.40	0.45	0.40	0.40	0.40	0.40	0.40	0.40
2014	0.40	1.40	0.80	5.65	0.40	0.40	0.40	0.40	0.40	0.40	0.40	33.20
2015	0.49	19.80	0.40	0.54	0.40	0.40	0.40	0.40	0.40	0.40	0.40	2.18
2016	19.25	2.45	44.94	0.92	0.40	0.40	0.40	0.40	0.40	2.88	1.04	17.71
2017	103.88	93.97	8.99	8.56	0.40	0.40	0.40	0.40	0.40	0.40	0.55	0.50
2018	2.34	0.57	8.99	7.48	0.40	0.40	0.40	0.40	0.40			
Mean	17.30	19.51	17.35	5.27	0.73	0.58	0.40	0.40	0.40	1.00	0.59	13.54
Median	3.39	2.45	8.99	5.65	0.40	0.40	0.40	0.40	0.40	0.40	0.43	2.18
			Mean Monthly Bypass + Spill for **Proposed Final Bypass** (cfs)									
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
2009										1.74	0.54	1.87
2010	14.72	28.25	15.07	14.80	1.39	0.40	0.40	0.40	0.40	1.69	1.75	10.81
2011	9.74	27.40	54.16	1.95	1.48	2.16	0.41	0.40	0.40	0.66	0.71	0.41
2012	2.31	1.61	20.69	11.77	0.40	0.40	0.40	0.40	0.40	0.40	1.06	53.58
2013	3.39	0.51	0.84	1.33	0.40	0.45	0.40	0.40	0.40	0.40	0.40	0.40
2014	0.40	3.16	5.38	2.26	0.40	0.40	0.40	0.40	0.40	0.40	0.60	29.29
2015	0.49	19.85	0.40	0.79	0.40	0.40	0.40	0.40	0.40	0.40	0.40	2.63
2016	18.51	2.75	44.73	0.98	0.40	0.40	0.40	0.40	0.40	2.88	1.68	16.95
2017	103.88	93.97	9.04	8.51	0.40	0.40	0.40	0.40	0.40	0.40	1.06	0.50
2018	3.66	0.57	7.43	7.30	0.40	0.40	0.40	0.40	0.40			
Mean	17.45	19.79	17.53	5.01	0.73	0.58	0.40	0.40	0.40	1.00	0.91	12.94
Median	3.66	3.16	9.04	2.26	0.40	0.40	0.40	0.40	0.40	0.40	0.71	2.63
			Mean Monthly Discharge (cfs) for **Napa River @ St. Helena** (USGS #11456000)									
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
2009										3.25	1.25	9.36
2010	384.8	213.2	181	219.6	35	11.4	3.13	1.08	0.057	13.8	16.6	293.1
2011	103.8	274.6	706	77.1	24.6	21.8	5.95	1.69	0.179	1.81	2.75	3.24
2012	70.1	12.3	339.8	147.5	18.9	4.84	1.49	0.121	0	0.311	93.1	614.7
2013	65.1	21.5	12.6	11.3	3.88	1.7	0.081	0	0	0	0	0.274
2014	1.25	128.2	76.3	111.3	10.4	1.82	0	0	0	0	0.589	357.8
2015	24.5	147.2	19.9	9.83	3.27	1.35	0.011	0	0	0	0.009	26.6
2016	251.2	49.4	498.4	39	12.2	3.05	0.085	0	0	9.32	27.4	232.7
2017	1,232	1,127	131.3	149.4	29.1	8.07	1.27	0	0	0	8.68	3.58
2018	38.5	11	170.2	97	13.1	3.05	1.06	na	na			
Mean	289	284	203	90	24	7.5	2.3	1.1	0.77	4.5	31	187
Median	70.1	128.2	170.2	97.0	13.1	3.1	1.1	0.0	0.0	0.2	5.7	129.7

NOTE: Summer mean monthly discharges of 0.4 cfs reported for permitted and proposed FBP operations represent an average of summer bypass flow releases made by the City in accordance with past accounting methods and likely represent releases made in excess of those required under the terms of its permits (i.e., exceeding actual inflows).

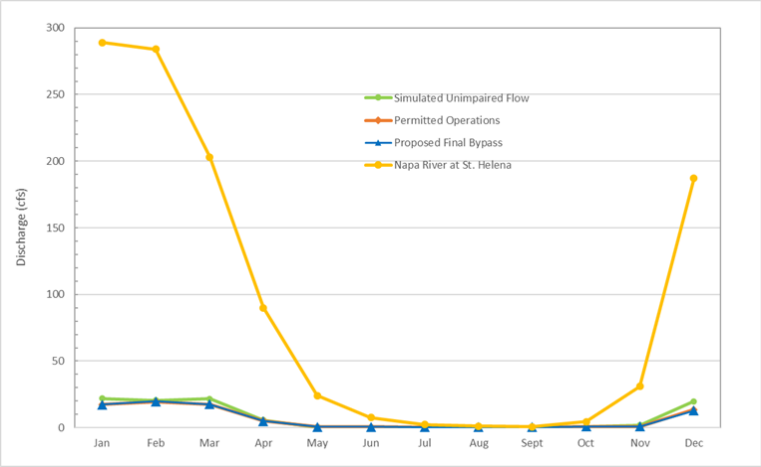


Figure 28. Mean monthly mean discharges for simulated unimpaired, permitted, and proposed bypass releases at Bell Canyon Reservoir conditions vs. mainstem Napa River at St. Helena, WY 2010-2018.

Adaptive Management

Adaptive management is a formal process for continually improving management policies and practices by learning from their outcomes (Taylor et al., 1997). The process involves:

- explicitly recognizing that there is uncertainty about the outcome of management activities;
- deliberately designing management policies or plans to increase understanding about the system, and reveal the best way of meeting objectives;
- carefully implementing the policy or plan;
- monitoring key response indicators;
- analyzing the outcomes, considering the objectives and predictions; and
- incorporating results into future decisions.

The effectiveness, and therefore appropriateness, of adaptive management depends on the policies or practices being implemented. The desired outcomes of physical habitat improvement efforts can be clearly defined prior to implementation, and the effectiveness of the project in achieving the desired outcomes can be evaluated quantitatively, and adjustments can be made if monitoring shows that desired outcomes were not achieved. For example, fisheries resource managers may identify an overall lack of pool habitat with significant residual depths in a stream reach. Noticing a lack of LWD features, they may design and implement an LWD augmentation project aimed at promoting localized scour and concomitant increases in residual pool depths. After implementation, residual pool depths can be monitored over a period of time and, depending on the results, a determination can be made as to whether or not the desired outcomes have been achieved. If not, appropriate adjustments in management can be made.

However, adaptively managing biological goals is more challenging. If the goal of a management action, such as increasing reservoir bypass flows to improve adult steelhead passage, and thus reproductive success, the results of

subsequent monitoring may or may not indicate increased recruitment of spawning adults to the watershed. Many outside factors, including ocean conditions, predation, and passage impediments further downstream, may contribute to low recruitment regardless of whether or not suitable passage and spawning conditions are provided below the reservoir.

An important underlying premise to adaptive management is that managers must have control over the policies and actions being implemented. Based on the results of our analysis, we determined that existing permitted bypass requirements appear inadequate to fully support fish passage and spawning opportunities that would be expected to occur in Bell Creek in the absence of the Bell Canyon Reservoir. Furthermore, we speculate that the reservoir has resulted in an as-yet unquantified interruption in coarse sediment (gravel) supply to the downstream reaches. Preliminary investigation also suggests that the reservoir may be causing elevated summer water temperatures in Bell Creek immediately below the reservoir, but the spatial extent of these effects is not known and is likely moderated by observed subsurface-surface water exchanges. Beyond these effects, additional habitat impairments, such as the observed paucity of LWD, were noted, but do not appear to be directly related to the City's operation of Bell Canyon Reservoir, and their remediation is not considered in this FBP and adaptive management plan.

To evaluate the efficacy of the proposed FBP bypass regime, and improve our understanding of the potential sediment transport and water temperature effects of Bell Canyon Reservoir, implementation of the following short-term monitoring and investigative efforts are recommended.

Bypass Flow Effectiveness Monitoring

We are fairly confident that implementation of our bypass flow recommendations will provide suitable fish passage conditions in Bell Creek. However, verification of the attainment of targeted conditions is an essential component of adaptive management. Moreover, some uncertainty remains regarding the intra-annual variability in surface water gains and losses between the reservoir and the identified critical riffles, and therefore the reliability of passage flow achievement at the evaluation sites. As such we propose:

1. Establishment of a short-term (3-5 years) streamflow gauging site in lower Bell Creek in the vicinity of the evaluation sites;

2. Periodic depth-across-transect measurements at the evaluation sites and 1-2 other riffles at various discharges over a period of 3-5 years.

Based on the results of effectiveness monitoring, potential adaptive management actions may consist of minor increases or decreases in bypass flow recommendations. However, the potential effects of any such adjustments on the City's water supply would need to be evaluated.

Sediment Transport Investigation

To more precisely quantify the effects of Bell Canyon Reservoir on coarse sediment (particularly gravel) transport to downstream reaches, we recommend implementation of a sediment transport investigation consisting of:

1. Comparative assessment of size class distributions of stream substrates upstream and downstream of the reservoir;

2. Assessment of size class distributions and volume of coarse sediment stored at the head of the reservoir.

Based on the results of the sediment transport investigation, a targeted gravel augmentation program may be recommended. Such a program may consist of harvesting coarse sediment from the head of the reservoir, if feasible, and stockpiling it within the artificial channel below the reservoir spillway for subsequent downstream transport by reservoir spill flows or strategically placing it within target reaches of Bell Creek.

Water Temperature Investigation

The results of a preliminary water temperature assessment suggest that Bell Canyon Reservoir may cause increases in surface water temperature from warm but upstream suitable temperatures to stressful temperatures immediately downstream of the reservoir, but these observed differences may simply be caused by the differences in measurement frequencies and accuracies. Moreover, diurnal air temperature fluctuations and subsurface-surface water exchanges may have a greater effect on stream water temperatures further downstream of the reservoir, potentially creating more favorable water temperatures, particularly within some of the deeper pools observed. We recommend implementation of the following assessment:

1. Short-term (2-3 year) deployment of a series (8-10) of summer (June-September) temperature loggers, strategically placed throughout the watershed, including immediately downstream of the dam outlet.

2. Periodic summer water temperature profiles collected within the reservoir.

3. One summer (June-September) of monthly of synoptic[8] measurements of streamflow, temperature and specific conductance.

If the results of the water temperature investigation confirm adverse effects of the reservoir, adaptive management of this effect would be difficult. Ensuring maintenance of hydrologic connectivity to downstream habitats during the onset of elevated temperature bypasses may be an option.

8 Synoptic surveys quantify changes with distance downstream or upstream from points of interest, such as a reservoir, tributary inflow, or dry stream reach. They are conducted by concurrently measuring conditions of interest at multiple points. Measurements are generally made by multiple teams at a given hour, or over the course of a day by a team moving downstream.

References

Agrawal, A., R. Schick, E. Bjorkstedt, R. Szerlong, M. Goslin, B. Spence, T. Williams, K. Burnett. 2005. Predicting the potential historical coho, Chinook, and steelhead habitat in Northern California. NOAA Technical Memorandum, NOAA-TM-NMFS-SWFSC-J79, NMFS Santa Cruz Laboratory, Santa Cruz, CA.

Becker, G., I. Reining, D. Asbury, and A. Gunther. 2007. San Francisco Estuary Watersheds Evaluation, Identifying Promising Locations for Steelhead Restoration in Tributaries of the San Francisco Estuary. Center for Ecosystem Management and Restoration.

Bisson, P. A., K. Sullivan, and J. L. Nielsen. 1988. Channel hydraulics, habitat use, and body form of juvenile coho salmon, steelhead trout, and cutthroat trout in streams. Transactions of the American Fisheries Society 117: 262-273.

Bjornn, T. C., and D. W. Reiser. 1991. Habitat requirements of salmonids in streams. Pages 83-138 *in* Influences of forest and rangeland management on salmonid fishes and their habitats. Special Publication No. 19*,* W. R. Meehan, editor. American Fisheries Society, Bethesda, Maryland.

Bouwes, N., N. Weber, C. E. Jordan, W. C. Saunders, I. A. Tattam, C. Volk and M. M. Pollock. 2016. Ecosystem experiment reveals benefits of natural and simulated beaver dams to a threatened population of steelhead (*Oncorhynchus mykiss*). Scientific Reports 6:28581.

California Department of Fish and Wildlife (CDFW). 2013. Standard Operating Procedure for the Wetted Perimeter Method in California. California Department of Fish and Wildlife Instream Flow Program Standard Operating Procedure DFG-IFP-004, 19 p.

Courter, I. I., D. B. Child, J. A. Hobbs, T. M. Garrison, J. J. G. Glessner, and S. Duery. 2013. Resident rainbow trout produce anadromous off-spring in a large interior watershed. Canadian Journal of Fisheries and Aquatic Sciences 70:701–710.

Ecotrust and FONR. 2002. Results of Hankin-Reeves standard uncalibrated *O. mykiss* survey of Napa River tributaries, Portland, OR.

Ettlinger, E., D. Morrell, A. Wolf, and G. M. Andrew. 2010. Lagunitas Creek spawner survey report 2009-2010. Marin Municipal Water District, Corte Madera, CA.

Flosi, G., S. Downie, J. Hopelain, M. Bird, R. Coey, and B. Collins. 1998. California Salmonid Stream Habitat Restoration Manual. 3rd edition, California Department of Fish and Game, Inland Fisheries Division. Sacramento, CA

Garza, J. C. and E. D. Crandall. 2013. Genetic analysis of Chinook salmon from the Napa River, California. Southwest Fisheries Science Center, Fisheries Ecology Division, and University of California, Santa Cruz, Institute of Marine Sciences.

Good, T. P., R. S. Waples, and P. Adams (editors). 2005. Updated status of federally listed ESUs of West Coast salmon and steelhead. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-NWFSC-66.

Grantham, T. E. and P. B. Moyle. 2014. Assessing flows for fish below dams: a systematic approach to evaluate compliance of California's dams with Fish and Game Code Section 5937. Center for Watershed Sciences Technical Report (CWS-2014-01), University of California, Davis. 106 p.

Graymer, R.W., Brabb, E.E., Jones, D.L., Barnes, J., Nicholson, R.S. and R.E. Stamski. 2007. Geologic Map and Map Database of Eastern Sonoma and Western Napa Counties, California. US Dept. of Interior, US Geological Survey, Scientific Investigation Map 2956.

Grossinger, R.M. 2012. Napa Valley Historical Ecology Atlas: Exploring a Landscape of Transformation and Resilience. Berkeley, CA. University of California Press.

Hayes, S. A., M. H. Bond, C. V. Hanson, E. V. Freund, J. J. Smith, E. C. Anderson, A. J. Ammann, and B. MacFarlane. 2008. Steelhead growth in a small central California watershed: Upstream and estuarine rearing patterns. Transactions of the American Fisheries Society 137:114-128.

Julien, P. Y. 2010. Erosion and Sedimentation (2nd Edition). Cambridge University Press. 371 p.

Koehler, J. T. 2002. Northern Napa River Watershed Plan. Prepared for California Department of Fish and Game (Contract # P9985160), Napa County Resource Conservation District, Napa, CA.

Leidy, R.A. 2007. Ecology, assemblage structure, distribution, and status of fishes in streams tributary to the San Francisco Estuary, California. SFEI Contribution #530. San Francisco Estuary Institute. Oakland, CA.

McCarthy, S. G., J. J. Duda, J. M. Ellen, G. R. Hodgson, and D. A. Beauchamp. 2009. Linking habitat quality with trophic performance of steelhead along forest gradients in the South Fork Trinity River Watershed, California. Transactions of the American Fisheries Society 138:506-521.

McEwan, D., and T. A. Jackson. 1996. Steelhead restoration and management plan for California. Management Report. California Department of Fish and Game, Inland Fisheries Division, Sacramento.

Meehan, W. R., and T. C. Bjornn. 1991. Salmonid distributions and life histories. Pages 47-82 *in* Influences of forest and rangeland management on salmonid fishes and their habitats. American Fisheries Society Special Publication No. 19, W. R. Meehan, editor. Bethesda, Maryland.

Montgomery, D.R. and Buffington, J.M. 1997. Channel-reach morphology in mountain drainage basins. GSA Bulletin, May 1997, 109(5)596-611.

Moyle, P. B. 2002. Inland Fishes of California, Revised and Expanded. University of California Press, Berkeley, California.

Myrick, C. A., and J. J. Cech. 2005. Effects of temperature on the growth, food consumption, and thermal tolerance of age-0 Nimbus-strain steelhead. North American Journal of Aquaculture 67:324–330.

Napa County Resource Conservation District (NCRCD). 2005. Central Napa River Watershed Project – Salmonid Habitat Form and Function. Prepared for California Department of Fish and Game.

Napa County Resource Conservation District (NCRCD). 2017. Napa River Steelhead and Salmon Monitoring Program – 2016-2017.

National Marine Fisheries Service (NMFS). 2005. Endangered and Threatened Species; Designation of Critical Habitat for Seven Evolutionarily Significant Units of Pacific Salmon and Steelhead in California; Final Rule. Federal Register, Vol. 70, No. 170, September 2.

National Marine Fisheries Service (NMFS). 2006. Final ESA Listing Determinations for 10 Distinct Population Segments of West Coast Steelhead, Final Rule; Federal Register Vol. 71, No. 3, January 5.

National Martine Fisheries Service (NMFS). 2016. CCC steelhead Intrinsic Potential metadata, available at: http://www.westcoast.fisheries.noaa.gov/maps_data/maps_and_gis_data.html, downloaded on April 26, 2016.

Opperman, J. J., 2005. Large woody debris and land management in California's hardwood-dominated watersheds, Environmental Management 35:266-277.

Pearce, S., O'Connor, M. Grossinger, R. and McKee, L. 2002. Napa River TMDL Baseline Study: Geomorphic Processes and Habitat Form and Function in Soda Creek. A Technical Report of the Regional Watershed Program, SFEI Contribution 63. San Francisco Estuary Institute, Oakland, CA. 100 p.

Pearce, S., O'Connor, M., McKee, L., and Jones, B., 2003a. Channel Geomorphology Assessment: A component of the watershed management plan for the Sulphur Creek watershed, Napa County, California. A Technical Report of the Regional Watershed Program, SFEI Contribution 68. San Francisco Estuary Institute, Oakland, CA. 60 p.

Pearce, S., O'Connor, M., McKee, L., and Jones, B., 2003b. Channel Geomorphology Assessment: A component of the watershed management plan for the Carneros Creek watershed, Napa County, California. A Technical Report of the Regional Watershed Program, SFEI Contribution 67. San Francisco Estuary Institute, Oakland, CA. 58 p.

PRISM. 2010. 800-meter Resolution Average Annual Precipitation and Temperature Data for 1981-2010, PRISM Climate Group, Oregon State University.

Prunuske Chatham, Inc. (PCI). 2014. Bell Canyon Reservoir Inflow Measurement Method Assessment and Recommendation, prepared for the City of St. Helena, August 8.

Shapovalov, L., and A. C. Taft. 1954. The life histories of the steelhead rainbow trout (*Salmo gairdneri gairdneri*) and silver salmon (*Oncorhynchus kisutch*) with special reference to Waddell Creek, California, and recommendations regarding their management. Fish Bulletin 98. California Department of Fish and Game.

Smith, J. J., and H. W. Li. 1983. Energetic factors influencing foraging tactics of juvenile steelhead trout *Salmo gairdneri*. Pages 173-180 *in* D. L. G. Noakes, D. G. Lindquist, G. Helfman, and J. Ward, editors. Predators and Prey in Fishes. Dr. W. Junk Publishers, The Hague, Netherlands.

Stillwater Sciences and W. E. Dietrich. 2002. Napa River basin limiting factors analysis. Technical report. Prepared by Stillwater Sciences and W. E. Dietrich, Berkeley, California for the San Francisco Regional Water Quality Control Board and California State Coastal Conservancy.

Sullivan, K., D. J. Martin, R. D. Cardwell, J. E. Toll and S. Duke. 2000. An Analysis of the Effects of Temperature on Salmonids of the Pacific Northwest with Implications for Selecting Temperature Criteria. Sustainable Ecosystem Institute, Portland, OR.

Taylor, B., L. Kremsater and R. Ellis. 1997. Adaptive management of forests in British Columbia. B.C. Ministry of Forests, Victoria, British Columbia, Canada.

Thompson, K., 1972. Determining Stream Flows for Fish Life in Pacific Northwest River Basins Commission Instream Flow Requirement Workshop, March 15-16.

Williams, T.H., B.C. Spence, D.A. Boughton, R.C. Johnson, L.G. Crozier, N.J. Mantua, M.R. O'Farrell, and S.T. Lindley. 2016. Viability assessment for Pacific salmon and steelhead listed under the Endangered Species Act: Southwest. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-SWFSC-564.