

Appendix C

HYDROLOGY MODEL RESULTS

HYDROLOGY MODELING RESULTS

C.1 INTRODUCTION

The results of model simulations are provided for informational purposes. Please do not use any information contained in these products for any purpose other than this EIR process. If there are any questions regarding the results of these model simulations, please contact DWR.

Any use of results of model simulations should observe limitations of the models used as well as the limitations to the modeled alternatives. These results should only be used for comparative purposes. More information regarding limitations of the models used as well as the limitations to the modeled alternatives is included Appendix H Attachment 1-7 Model Limitations.

[This appendix includes updates since the DEIR to include Refined Alternative 2b, which has been identified as the preferred alternative. This appendix refers to Alternative 2b and Refined Alternative 2b interchangeably.](#)

C.2 MODELED ALTERNATIVES

The following alternatives were prepared:

- Existing Conditions (EX)
- Proposed Project (PP)
- Refined Alternative 2b (Alt 2b)

C.2.1 EXISTING CONDITIONS

The Existing Conditions represents CVP and SWP operations to comply with the “current” regulatory environment as of (April 22, 2019). The Existing Conditions assumptions include existing facilities and ongoing programs that existed as of April 22, 2019- publication date of the Notice of Preparation (NOP). The Existing Conditions assumptions also include facilities and programs that received approvals and permits by April 2019 because those programs were consistent with existing management direction as of the NOP.

C.2.2 PROPOSED PROJECT

The proposed project is the DWR on-going long-term operation of the State Water Project (SWP) consistent with existing regulatory requirements that address water rights, water quality, and the protection and conservation of designated species in compliance with California Endangered Species Act (CESA). The goal of the proposed project is to continue the long-term operation of the SWP for water supply and power generation, consistent with applicable laws, contractual obligations, and agreements, and to increase operational flexibility by focusing on nonoperational measures to avoid significant adverse effects. DWR proposes to store, divert, and convey water in accordance with existing water contracts and agreements up to full contract amounts and other deliveries, consistent with water rights and applicable laws and regulations.

C.2.3 REFINED ALTERNATIVE 2B

Refined Alternative 2b includes elements of the operations described in the Proposed Project, but also consists of SWP export curtailments by operating to Spring Maintenance Flow and a dedicated “block” of water for summer or fall Delta outflow and additional Wet year water for use in summer-fall period of subsequent years in addition to the Summer/Fall Delta Smelt Habitat Action in the Proposed Project. The additional spring through fall water dedicated for Delta outflow would be used to test hypotheses through scientific studies and narrow the uncertainty surrounding the effect of Delta outflow on spring Longfin Smelt abundance and summer-fall Delta Smelt habitat. The details of the scientific studies will be developed by DWR in coordination with CDFW and SWC as described in Chapter 5.3.2, “Adaptive Management Plan.”

Although refinements to Alternative 2b occurred between publication of the DEIR and the FEIR, these refinements do not affect the modeling. Although this appendix references Alternative 2b and Refined Alternative 2b interchangeably, the modeling assumptions included in this appendix reflect the description of the Refined Alternative 2b presented in Chapter 5.3 of the FEIR.

The following model simulations were prepared for each alternative:

- CalSim II
- DSM2

C.3 MODEL RESULTS FOR MODELED ALTERNATIVES

C.3.1 MODEL RESULTS

The results for each Existing Conditions and Proposed Project alternatives for each model are compiled in tables and charts in the following attachments:

- Appendix C Attachment 2-1 Storage and Elevation Results (CalSim II)
- Appendix C Attachment 2-2 Flow Results (CalSim II)
- Appendix C Attachment 2-3 Diversion Results (CalSim II)
- Appendix C Attachment 2-4 Water Supply Results (CalSim II)
- Appendix C Attachment 2-5 X2 Results (CalSim II)
- Appendix C Attachment 2-6 Stage Results (DSM2)
- Appendix C Attachment 2-7 EC Results (DSM2)
- Appendix C Attachment 2-8 Chloride Results (DSM2)
- Appendix C Attachment 2-9 D1641 Compliance Results (DSM2)
- Appendix C Attachment 2-10 D1641 Compliance Results (CalSim II)

The results for Existing Conditions and Refined Alternative 2b alternatives for each model are compiled in tables and charts in the following attachments:

- Appendix C Attachment 3-1 Storage and Elevation Results (CalSim II)
- Appendix C Attachment 3-2 Flow Results (CalSim II)

- [Appendix C Attachment 3-3 Diversion Results \(CalSim II\)](#)
- [Appendix C Attachment 3-4 Water Supply Results \(CalSim II\)](#)
- [Appendix C Attachment 3-5 X2 Results \(CalSim II\)](#)
- [Appendix C Attachment 3-6 Stage Results \(DSM2\)](#)
- [Appendix C Attachment 3-7 EC Results \(DSM2\)](#)
- [Appendix C Attachment 3-8 Chloride Results \(DSM2\)](#)
- [Appendix C Attachment 3-9 D1641 Compliance Results \(DSM2\)](#)
- [Appendix C Attachment 3-10 D1641 Compliance Results \(CalSim II\)](#)

Each attachment includes a catalog of results included.

As noted in the Introduction, any use of results of model simulations should observe limitations of the models used as well as the limitations to the modeled alternatives. These results should only be used for comparative purposes. More information regarding limitations of the models used as well as the limitations to the modeled alternatives is included Appendix C Attachment 1-7 Model Limitations.

C.3.2 FORMATS PROVIDED

The following formats are provided:

- Monthly tables comparing two alternatives (exceedance values, long-term average, and average by water year type)
- Monthly pattern charts (long-term average and average by water year type) including all alternatives
- Monthly exceedance charts (all months) including all alternatives

C.4 REFERENCES

Anderson, James. (2018). Using river temperature to optimize fish incubation metabolism and survival: a case for mechanistic models. 10.1101/257154.

California Department of Water Resources, DSM2: Delta Simulation Model 2 Web Page Last updated September 2019. Site accessed October 2019. URL = <https://water.ca.gov/Library/Modeling-and-Analysis/Bay-Delta-Region-models-and-tools/Delta-Simulation-Model-II>

Draper, A.J., Munévar, A., Arora, S.K., Reyes, E., Parker, N 1 .L., Chung, F.I., and Peterson, L.E. 2004. CalSim: Generalized Model for Reservoir System Analysis. American Society of Civil Engineers, Journal of Water Resources Planning and Management, Vol. 130, No. 6.

U. S. Bureau of Reclamation, 2015. Coordinated Long Term Operation of the CVP and SWP EIS, Appendix 5A CalSim II and DSM2 Modeling.

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