

CHOWCHILLA SUBBASIN

Sustainable Groundwater
Management Act (SGMA)

Groundwater Sustainability Plan

Chapter 6

January 2020



Prepared by

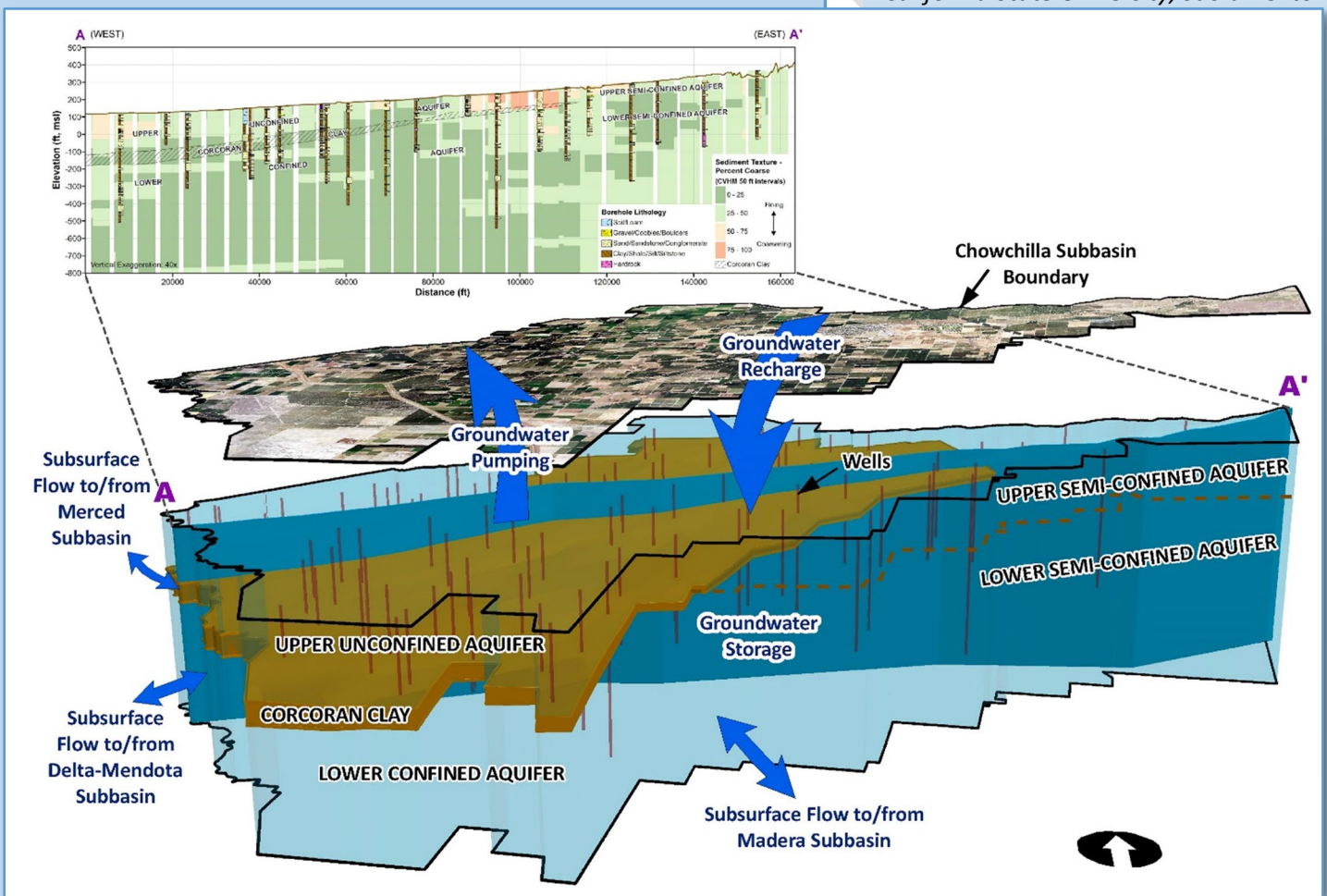
Dauids Engineering, Inc

Luhdorff & Scalmanini

ERA Economics

Stillwater Sciences and

California State University, Sacramento



PUBLIC REVIEW DRAFT

Chowchilla Subbasin

Sustainable Groundwater
Management Act

**Groundwater Sustainability Plan
Chapter 6**

January 2020

Prepared For

Chowchilla Subbasin GSP Advisory Committee

Prepared By

Davids Engineering, Inc
Luhdorff & Scalmanini
ERA Economics
Stillwater Sciences and
California State University, Sacramento

TABLE OF CONTENTS

6 REFERENCES.....6-1

DRAFT

6 REFERENCES

- Allen, R.G., Pereira, L.S., Howell, T.A., and Jensen, M.E., 2011, Evapotranspiration Information Reporting: I. Factors Governing Measurement Accuracy. *Agricultural Water Management*. 98(6): 899-920 pp.
- Allen, R. G., M. Tasumi, A. Morse, R. Trezza, J. L. Wright, W. Bastiaanssen, W. Kramber, I. Lorite, and C. W. Robison. 2007. Satellite-based energy balance for mapping evapotranspiration with internalized calibration (METRIC)—Applications. *J. Irrig. and Drain. Engng.* 133(4): 395-406.
- Allen, R., A. Irmak, R. Trezza, J. M. Hendrickx, W. Bastiaanssen, and J. Kjaersgaard. 2011. Satellite-based ET estimation in agriculture using SEBAL and METRIC. *Hydrological Processes*. 25(26): 4011-4027.
- American Society of Agricultural and Biological Engineers (ASABE). 2007. Design and Operation of Farm Irrigation Systems. G. J. Hoffman, R. G. Evans, M. E. Jensen, D. L. Martin, and R. L. Elliott (eds), *Am. Soc. Ag and Bio. Engrs.*, 863 pp.
- American Society of Civil Engineers (ASCE). 2016. Evaporation, Evapotranspiration and Irrigation Water Requirements. Manual 70. Second Edition. M. E. Jensen and R. G. Allen (eds). *Am. Soc. Civ. Engrs.*, 744 pp.
- ASCE Environmental and Water Resources Institute (ASCE-EWRI). 2005. The ASCE standardized reference evapotranspiration equation, R. G. Allen, I. A. Walter, R. L. Elliott, T. A. Howell, D. Itenfisu, M. E. Jensen, and R. L. Snyder (eds). Task Committee on Standardization of Reference Evapotranspiration of EWRI, Reston, VA.
- Bastiaanssen, W. G. M., E. J. M. Noordman, H. Pelgrum, G. Davids, B. P. Thoreson, R. G. Allen. 2005. SEBAL Model with Remotely Sensed Data to Improve Water Resources Management under Actual Field Conditions. *J. Irrig. Drain. Eng.* 131(1): 85-93.
- Boyle Engineering Corporation. 2008. City of Chowchilla 2008 Urban Water Management Plan, Administrative Draft. September 2008.
- California Department of Water Resources (DWR). 1981. Bulletin No. 74-81 – Water Well Standards: State of California (and draft supplemental Bulletin 74-90). (http://wdl.water.ca.gov/well_standards/well_standards_content.html). Last accessed July 2019.
- DWR.1992. San Joaquin District, Line of Equal Elevation of Water in Wells, San Joaquin Valley, 1989 and 1993, Memorandum Report by Anthony Camoroda.
- DWR. 2003. Bulletin 118: California’s Groundwater, Update 2003.
- DWR. 2007. California Central Valley Unimpaired Flow Data, Fourth Edition Draft. Bay-Delta Office, California Department of Water Resources. May 2007.
- DWR. 2016. Bulletin 118: California’s Groundwater, Interim Update 2016. December 22, 2016.
- DWR. 2015. IWFM Demand Calculator: IDC-2015, revision 36. Theoretical Documentation and User’s Manual. Central Valley Modeling Unit, Modeling Support Branch, Bay-Delta Office. Sacramento, CA.
- DWR. 2015. Integrated Water Flow Model Demand Calculator (IDC), version 2015.0.0036, Retrieved from: <https://water.ca.gov/Library/Modeling-and-Analysis/Modeling-Platforms/Integrated-Water-Flow-Model-Demand-Calculator>.
- DWR. 2015. Best Management Practices for the Sustainable Management of Groundwater: Water Budget BMP. California DWR Sustainable Groundwater Management Program. December 2016.

- DWR. 2016. Best Management Practices for Sustainable Management of Groundwater, Hydrogeologic Conceptual Model, BMP.
- DWR. 2016. Best Management Practices for Sustainable Management of Groundwater, Monitoring Networks and Identification of Data Gaps, BMP.
- DWR. 2016. Best Management Practices for Sustainable Management of Groundwater, Water Budget, BMP.
- DWR. 2016. California's Groundwater, Bulletin 118 Interim Update 2016.
- DWR. 2017. Best Management Practices for the Sustainable Management of Groundwater: Sustainable Management Criteria BMP (Draft). California DWR Sustainable Groundwater Management Program. November 2017.
- DWR. 2019. Chronological Reconstructed Sacramento and San Joaquin Valley Water Year Hydrologic Classification Indices, California Cooperative Snow Surveys. Available at: <http://cdec.water.ca.gov/cgi-progs/iodir/WSIHIST>. Last accessed on 2/22/2019.
- Castle and Cooke. 2018. Central California Irrigation District Hazard Mitigation Grant Program DR-4308: Attachment 1 - Subapplication Responses. MARPRO Red Top Joint Banking.
- City of Chowchilla. 2017. City of Chowchilla 2040 General Plan, updated 2017.
- Chowchilla Water District. 2017. Water Management Plan, 2014 Criteria. Final version April 12, 2017.
- Chowchilla Water District-Red Top RCD Joint Powers Authority. 1997. Groundwater Management Plan In accordance with AB 3030, 1997.
- Clemmens, A. J. and C. M. Burt. 1997. Accuracy of irrigation efficiency estimates. *J. Irrig. and Drain. Engng.* 123(6): 443-453.
- County of Madera, 1995, Madera County General Plan, Adopted October 24, 1995, Updated November 3, 2015.
- County of Madera, Fall Creek Engineering, Sierra Watershed Progressive, and 2NDNATURE (2N), 2017, County of Madera Storm Water Resource Plan.
- Davids Engineering (DE) and Luhdorff and Scalmanini Consulting Engineers (LSCE), 2017, Technical Memorandum: Chowchilla Subbasin Sustainable Groundwater Management Act, Data Collection and Analysis, prepared for Chowchilla Subbasin Coordination Committee.
- Driscoll, F.G. 1986. Groundwater and Wells, Johnson Screens, St. Paul, Minnesota.
- Englehardt, J. D., T. Wu, F. Bloetscher, Y. Deng, P. Du Pisani, S. Eilert, S. Elmir, T. Guo, J. Jacangelo, M. LeChevallier, and H. Leverenz. 2016. Net-zero Water Management: Achieving Energy-Positive Municipal Water Supply. *Environmental Science: Water Research & Technology.* 2(2): 250-260.
- Friant Water Users Authority Natural Resources Defense Council. 2002. San Joaquin River Restoration Study Background Report, Chapter 2: Surface Water Hydrology.
- Friant Water Authority. 2018. Technical Memorandum: Estimate of Future Friant Division Supplies for use in Groundwater Sustainability Plans, California. December 2018.
- Herum Crabtree Suntag Attorneys. 2017. Clayton Water District Municipal Service Review. Prepared for the Madera Local Agency Formation Commission (LAFCO). January 2017.

- Hopkins, J., 1994, Explanation of the Texas Water Development Board groundwater level monitoring program and water-level measuring manual: UM-52, 53 p.
<http://www.twdb.texas.gov/groundwater/docs/UMs/UM-52.pdf>
- Klausmeyer, K., J. Howard, T. Keeler-Wolf, K. Davis-Fadtke, R. Hull, and A. Lyons. 2018. Mapping indicators of groundwater dependent ecosystems in California. <https://data.ca.gov/dataset/natural-communities-commonly-associated-groundwater>
- Land Use Associates. 2011. City of Chowchilla Sphere of Influence Expansion and Municipal Service Review. Prepared for the Madera Local Agency Formation Commission (LAFCO). September 2011.
- Loux, J., R. Winer-Skonovd, and E. Gellerman. 2012. Evaluation of Combined Rainwater and Greywater Systems for Multiple Development Types in Mediterranean climates. *Journal of Water Sustainability*. 2(1): 55-77.
- Luhdorff and Scalmanini Consulting Engineers (LSCE). 2014. East San Joaquin Water Quality Coalition Groundwater Quality Assessment Report. January 2014
- Luhdorff and Scalmanini Consulting Engineers (LSCE) and Larry Walker Associates. 2016. Region 5: Updated Groundwater Quality Analysis and High Resolution Mapping for Central Valley Salt and Nitrate Management Plan.
- McBain & Trush, Inc., editors. 2002. San Joaquin River Restoration Study Background Report, prepared for Friant Water Users Authority, Lindsay, CA, and Natural Resources Defense Council, San Francisco, CA.
- Madera County Department of Agriculture Weights and Measures. 2017 Madera County Agricultural Crop and Livestock Report.
- Mendenhall, W.C., Dole, R.B., and H. Stabler. 1916. Ground Water in San Joaquin Valley, California, USGS Water-Supply Paper 398.
- Merced County. 2016. 2030 Merced County General Plan. December 10, 2013, updated 2016.
- Merced County Department of Agriculture. 2017. Report on Agriculture.
- Mitten, H.T., Bertoldi, G.L., and LeBlanc. R.A. 1970. Geology, Hydrology and Quality of Water in the Madera Area, San Joaquin Valley, California, USGS Open File Report 70-228, 1970.
- National Marine Fisheries Service (NMFS). 2016. California Species List. Intersection of USGS Topographic Quadrangles with NOAA Fisheries ESA Listed Species, Critical Habitat, Essential Fish Habitat, and MMPA Species Data. Google Earth (KMZ) file available at: https://www.westcoast.fisheries.noaa.gov/maps_data/california_species_list_tools.html [accessed July 2019].
- Olmos, K. C. and F. J. Loge. 2013. Offsetting Water Conservation Costs to Achieve Net-Zero Water Use. *Journal-American Water Works Association*. 105(2): E62-E72.
- Page, R.W. 1973. Base of Fresh Ground Water (approximately 3,000 micromhos) in the San Joaquin Valley, California, USGS Hydrologic Investigations Atlas HA-489.
- Page, R.W. 1986. Geology of the Fresh Ground-Water Basin of the Central Valley, California, with Texture Maps and Sections, USGS Professional Paper 1401-C.
- Pacific Fishery Management Council (PFMC). 2014. Appendix A to the Pacific Coast Salmon Fishery Management Plan, as modified by amendment 18 to the Pacific Coast Salmon Plan. Identification and description of essential fish habitat, adverse impacts, and recommended conservation measures for

salmon. https://www.pcouncil.org/wp-content/uploads/Salmon_EFH_Appendix_A_FINAL_September-25.pdf

Provost & Pritchard, Wood Rodgers, and KDSA. 2014. Madera Regional Groundwater Management Plan, prepared for City of Chowchilla, Chowchilla Water District, City of Madera, Madera County, Madera irrigation District, and South-Est Madera County United.

Provost & Pritchard, 2015, Madera Integrated Regional Water Management Plan, February 2015.

Regional Water Quality Control Board (RWQCB), Central Valley Region, 2018, Amendments to the Water Quality Control Plans for the Sacramento River and San Joaquin River Basins and Tulare Lake Basin to Incorporate a Central Valley-wide Salt and Nitrate Control Program.

Rohde, M. M., S. Matsumoto, J. Howard, S. Liu, L. Riege, and E. J. Remson. 2018. Groundwater Dependent Ecosystems under the Sustainable Groundwater Management Act: Guidance for Preparing Groundwater Sustainability Plans. The Nature Conservancy, San Francisco, California.

State Water Resources Control Board (SWRCB). 1995. Water Quality Control Plan for the San Francisco Bay/ Sacramento-San Joaquin Delta Estuary. California Environmental Protection Agency SWRCB. p. 24.

Steiner, D. B. 2005. Effects to Water Supply and Friant Operations Resulting From Plaintiffs' Friant Release Requirements. Expert report prepared by Daniel B. Steiner for Friant Water Users Authority. September 16, 2005.

The Nature Conservancy (TNC). 2014. Groundwater and stream interaction in California's Central Valley: insights for sustainable groundwater management. Prepared by RMC Water and Environment.

Todd Engineers. 1997. CWD-Red Top RCD Joint Powers Authority Groundwater Management Plan.

Todd Engineers. 2002. AB3030 Groundwater Management Plan, Madera County, Final Draft, prepared for County of Madera Engineering and General Services.

Thoreson, B., B. Clark, R. Soppe, A. Keller, W. Bastiaanssen, and J. Eckhardt. 2009. Comparison of Evapotranspiration Estimates from Remote Sensing (SEBAL), Water Balance, and Crop Coefficient Approaches. Proceedings of the 2009 World Environmental & Water Resources Congress American Society of Civil Engineers Environmental and Water Resources Institute. Kansa City, MO.

University of California Cooperative Extension (UCCE). 1987. Leaflet 21427: Using reference evapotranspiration (ET_o) and crop coefficients to estimate crop evapotranspiration (ET_c) for agronomic crops, grasses, and vegetables, crops, University of California.

United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS). 2004. National Engineering Handbook: Part 630—Hydrology, Chapters 9 and 10. USDA, Natural Resources Conservation Service: Washington, DC.

USDA-NRCS. 2007. National Engineering Handbook: Part 630—Hydrology, Chapter 7. USDA, Natural Resources Conservation Service: Washington, DC.

USDA-NRCS. 2007. National Engineering Handbook: Part 630—Hydrology, Chapter 10: Estimation of Direct Runoff from Storm Rainfall. USDA, Natural Resources Conservation Service: Washington, DC.

U.S. Environmental Protection Agency (USEPA), 2009, National Primary Drinking Water Regulations, https://www.epa.gov/sites/production/files/2016-06/documents/npwdr_complete_table.pdf

United States Fish and Wildlife Service (USFWS). 2019. Threatened & Endangered Species Active Critical Habitat Report: online mapping tool.

<https://fws.maps.arcgis.com/home/webmap/viewer.html?webmap=9d8de5e265ad4fe09893cf75b8dbfb77> [accessed May 2019].

DRAFT