Appendix 1A

Glossary of Terms

GLOSSARY

This Glossary includes terms from a variety of legal and administrative sources relevant to SGMA and GSP development. These sources include:

- California Water Code Section 10721, Sustainable Groundwater Management Definitions (CWC Section 10721)
- California Code of Regulations Title 23 Section 341, Groundwater Basin Boundaries Definitions (23 CCR Section 341)
- California Code of Regulations Title 23 Section 351, Groundwater Sustainability Plan Definitions (23 CCR Section 351)
- DWR Bulletin 118 Definitions, updated 2003 (B118, 2003)
- Locally defined terms used in the GSP

The source of each term is provided in the citation following that term. Page numbers are included when a definition is not found in the referenced document's definitions or glossary. Additional information regarding each source are summarized at the end of this glossary.

Adjudication Action	The action filed in the superior or federal district court to determine the rights to extract groundwater from a basin or store water within a basin, including, but not limited to, actions to quiet title respecting rights to extract or store groundwater or an action brought to impose a physical solution on a basin. (CWC Section 10721)
Administrative Adjustment	The basin or subbasin boundary adjustment by the Department that either (1) amends existing basin or subbasin boundary data files to accurately reflect an unambiguous written basin or subbasin boundary description as defined in Bulletin 118 or amended pursuant to this Part, or (2) restates the description of a basin or subbasin boundary to more precisely reflect a mapped basin or subbasin boundary consistent with the original description. (B118, 2003)
Agency	The groundwater sustainability agency as defined in the Act. (23 CCR Section 351)
Agricultural Water Management Plan	The plan adopted pursuant to the Agricultural Water Management Planning Act as described in Part 2.8 of Division 6 of the Water Code, commencing with Section 10800 et seq. (23 CCR Section 351)
Alternative	The alternative to a Plan described in Water Code Section 10733.6. (23 CCR Section 351)
Annual Report	The report required by Water Code §10728. (23 CCR Section 351)
Aquifer	The three-dimensional body of porous and permeable sediment or sedimentary rock that contains sufficient saturated material to yield significant quantities of groundwater to wells and springs, as further defined or characterized in Bulletin 118. (B118, 2003)
Baseline or Baseline Conditions	The historical information used to project future conditions for hydrology, water demand, and availability of surface water and to evaluate potential sustainable management practices of a basin. (23 CCR Section 351)
Basin	Defined in the Sustainable Groundwater Management Act as a groundwater basin or subbasin identified and defined in Bulletin 118. Unless the context indicates otherwise, those terms are further defined as follows: (1) The term basin shall refer to an area specifically defined as a basin or groundwater basin in Bulletin 118, and shall refer generally to an aquifer or stacked series of aquifers with reasonably well-defined

	boundaries in a lateral direction, based on features that significantly impede groundwater flow, and a definable bottom, as further defined or characterized in Bulletin 118. (2) The term <i>subbasin</i> shall refer to an area specifically defined as a subbasin or <i>groundwater subbasin</i> in Bulletin 118 and shall refer generally to any subdivision of a basin based on geologic and hydrologic barriers or institutional boundaries, as further described or defined in Bulletin 118. (B118, 2003)
Basin Setting	The information about the physical setting, characteristics, and current conditions of the basin as described by the Agency in the hydrogeologic conceptual model, the groundwater conditions, and the water budget, pursuant to Sub article 2 of Article 5. (23 CCR Section 351)
Beneficial Use	Water in Bulletin 118 references 23 categories of water uses identified by the State Water Resource Control Board and are listed and briefly described in Appendix E. (B118, 2003)
Best Available Science	The use of sufficient and credible information and data, specific to the decision being made and the time frame available for making that decision, that is consistent with scientific and engineering professional standards of practice. (23 CCR Section 351)
Best Management Practice	The practice, or combination of practices, that are designed to achieve sustainable groundwater management and have been determined to be technologically and economically effective, practicable, and based on best available science. §351. (23 CCR Section 351)
Board	The State Water Resources Control Board. (23 CCR Section 351)
Bulletin 118	The department's report entitled "California's Groundwater: Bulletin 118" updated in 2003, as it may be subsequently updated or revised in accordance with § 12924. (CWC Section 10721)
CASGEM	The California Statewide Groundwater Elevation Monitoring Program developed by the Department pursuant to Water Code Section 10920 et seq., or as amended. (23 CCR Section 351)
Condition of Long-Term Overdraft	The condition of a groundwater basin where the average annual amount of water extracted for a long-term period, generally 10 years or more, exceeds the long-term average annual supply of water to the basin, plus any temporary surplus. Overdraft during a period of drought is not sufficient to establish a condition of long-term overdraft if extractions and recharge are managed as necessary to ensure that reductions in groundwater levels or storage during a period of drought are offset by increases in groundwater levels or storage during other periods. (CWC Section 10721)
Coordination Agreement	The legal agreement adopted between two or more groundwater sustainability agencies that provides the basis for coordinating multiple agencies or groundwater sustainability plans within a basin pursuant to this part. (CWC Section 10721)
Data Gap	The lack of information that significantly affects the understanding of the basin setting or evaluation of the efficacy of Plan implementation and could limit the ability to assess whether a basin is being sustainably managed. (23 CCR Section 351)
Existing Stored Groundwater	Groundwater that is already underground from centuries of accumulated native groundwater. Historic pumping has been diminishing the existing stored groundwater at rates greater than the native groundwater can sustain, causing overdraft and unsustainable conditions. If more water is pumped from a basin than what is added from Native Groundwater and Introduced Groundwater, this water comes from the Existing Stored Groundwater. Continuing to use this previously stored groundwater will continue to exacerbate overdraft conditions. Temporarily using some of this

	water during the transition to sustainability will likely continue to cause lowering of groundwater levels.
Groundwater	Water beneath the surface of the earth within the zone below the water table in which the soil is completely saturated with water but does not include water that flows in known and definite channels. (CWC Section 10721)
Groundwater Basin	The groundwater basin or subbasin identified and defined in Bulletin 118 or as modified pursuant to Water Code 10722 et seq. (23 CCR Section 351)
Groundwater Dependent Ecosystem	The ecological communities or species that depend on groundwater emerging from aquifers or on groundwater occurring near the ground surface. (23 CCR Section 351)
Groundwater Flow	The volume and direction of groundwater movement into, out of, or throughout a basin. (23 CCR Section 351)
Groundwater in Storage	The quantity of water in the zone of saturation. (B118, 2003)
Groundwater Overdraft	The condition of a groundwater basin in which the amount of water withdrawn by pumping exceeds the amount of water that recharges the basin over a period of years during which water supply conditions approximate average conditions. (B118, 2003)
Groundwater Recharge or Recharge	The augmentation of groundwater by natural or artificial means. (CWC Section 10721)
Groundwater Storage Capacity	The volume of void space that can be occupied by water in a given volume of a formation, aquifer, or groundwater basin. (B118, 2003)
Groundwater Sustainability Agency	One or more local agencies that implement the provisions of this part. For purposes of imposing fees pursuant to Chapter 8 (commencing with Section 10730) or taking action to enforce a groundwater sustainability plan, <i>Groundwater Sustainability Agency</i> also means each local agency comprising the groundwater sustainability agency if the plan authorizes separate agency action. (CWC Section 10721)
Hydrogeologic Conceptual Model	The description of the geologic and hydrologic framework governing the occurrence of groundwater and its flow through and across the boundaries of a basin and the general groundwater conditions in a basin or subbasin. (23 CCR Section 341)
Interconnected Surface Water	The surface water that is hydraulically connected at any point by a continuous saturated zone to the underlying aquifer and the overlying surface water is not completely depleted. (23 CCR Section 351)
Interested Parties	The persons and entities on the list of interested persons established by the Agency pursuant to Water Code Section 10723.4. (23 CCR Section 351)
Interim Milestone	The target value representing measurable groundwater conditions, in increments of five years, set by an Agency as part of a Plan. (23 CCR Section 351)
Introduced Groundwater	Water that is added to the sustainable yield of groundwater supply derived from percolation of imported surface water. This can be the directly through groundwater replenishment projects or groundwater banking or can be indirectly through percolation from irrigation and unlined canals.
Management Area	The area within a basin for which the Plan may identify different minimum thresholds, measurable objectives, monitoring, or projects and management actions based on differences in water use sector, water source type, geology, aquifer characteristics, or other factors. (23 CCR Section 351)
Measurable Objectives	The specific, quantifiable goals for the maintenance or improvement of specified groundwater conditions that have been included in an adopted Plan to achieve the sustainability goal for the basin. (23 CCR Section 351)

Minimum Threshold	The numeric value for each sustainability indicator used to define undesirable results. (23 CCR Section 351)
Monitoring Protocols	Designed to detect changes in groundwater levels, groundwater quality, inelastic surface subsidence for basins for which subsidence has been identified as a potential problem, and flow and quality of surface water that directly affect groundwater levels or quality or are caused by groundwater extraction in the basin. The monitoring protocols shall be designed to generate information that promotes efficient and effective groundwater management. §10727.2. Required Plan Elements. (CWC Section 10721)
NAD83	The North American Datum of 1983 computed by the National Geodetic Survey, or as modified.
Native Groundwater	Water naturally infiltrating into the groundwater from precipitation and runoff. This is the average quantity of water annually added to the groundwater budget from rain, rivers, and streams, and reflects the portion of estimated sustainable yield of the groundwater supply that is not derived from imported surface water.
NAVD88	The North American Vertical Datum of 1988 computed by the National Geodetic Survey, or as modified. (23 CCR Section 351)
Plain Language	The language that the intended audience can readily understand and use because that language is concise, well-organized, uses simple vocabulary, avoids excessive acronyms and technical language, and follows other best practices of plain language writing. (23 CCR Section 351)
Plan	The groundwater sustainability plan as defined in the Act. (23 CCR Section 351)
Plan Implementation	The Agency's exercise of the powers and authorities described in the Act, which commences after an Agency adopts and submits a Plan or Alternative to the Department and begins exercising such powers and authorities. (23 CCR Section 351)
Plan Manager	An employee or authorized representative of an Agency, or Agencies, appointed through a coordination agreement or other agreement, who has been delegated management authority for submitting the Plan and serving as the point of contact between the Agency and the Department. (23 CCR Section 351)
Planning and Implementation Horizon	The 50-year time period over which a groundwater sustainability agency determines that plans and measures will be implemented in a basin to ensure that the basin is operated within its sustainable yield. (CWC Section 10721)
Principal Aquifers	The aquifers or aquifer systems that store, transmit, and yield significant or economic quantities of groundwater to wells, springs, or surface water systems. (23 CCR Section 351)
Qualified Map	The geologic map of a scale no smaller than 1:250,000 that is published by the U. S. Geological Survey or the California Geological Survey, or is a map published as part of a geologic investigation conducted by a state or federal agency, or is a geologic map prepared and signed by a Professional Geologist that is acceptable to the Department. (23 CCR Section 341)
Recharge Area	The area that supplies water to an aquifer in a groundwater basin. (CWC Section 10721)
Reference Point	The permanent, stationary and readily identifiable mark or point on a well, such as the top of casing, from which groundwater level measurements are taken, or other monitoring site. (23 CCR Section 351)
Representative Monitoring	The monitoring site within a broader network of sites that typifies one or more conditions within the basin or an area of the basin. (23 CCR Section 351)
Safe Yield	The maximum quantity of water that can be continuously withdrawn from a groundwater basin without adverse effect. (B118, 2003)

Saturated Zone	The zone in which all interconnected openings are filled with water, usually underlying the unsaturated zone. (B118, 2003)
Seasonal High	The highest annual static groundwater elevation that is typically measured in the Spring and associated with stable aquifer conditions following a period of lowest annual groundwater demand. (23 CCR Section 351)
Seasonal Low	The lowest annual static groundwater elevation that is typically measured in the Summer or Fall and associated with a period of stable aquifer conditions following a period of highest annual groundwater demand. (23 CCR Section 351)
Seawater Intrusion	The advancement of seawater into a groundwater supply that results in degradation of water quality in the basin and includes seawater from any source. (23 CCR Section 351)
Statutory Deadline	The date by which an Agency must be managing a basin pursuant to an adopted Plan, as described in Water Code Sections 10720.7 or 10722.4. (23 CCR Section 351)
Sustainability Goal	The existence and implementation of one or more groundwater sustainability plans that achieve sustainable groundwater management by identifying and causing the implementation of measures targeted to ensure that the applicable basin is operated within its sustainable yield. (CWC Section 10721)
Sustainability Indicator	The effects caused by groundwater conditions occurring throughout the basin that, when significant and unreasonable, cause undesirable results, as described in Water Code §10721(x). (23 CCR Section 351)
Sustainable Groundwater Management	The management and use of groundwater in a manner that can be maintained during the planning and implementation horizon without causing undesirable results. (CWC Section 10721)
Sustainable Yield	The maximum quantity of water calculated over a base period representative of long- term conditions in the basin and including any temporary surplus, that can be withdrawn annually from a groundwater supply without causing an undesirable result. (CWC Section 10721)
Technical Study	The geologic or hydrologic report prepared and published by a state or federal agency, or a study published in a peer-reviewed scientific journal, or a report prepared and signed by a Professional Geologist or by a Professional Engineer. (23 CCR Section 341)
Uncertainty	The lack of understanding of the basin setting that significantly affects an Agency's ability to develop sustainable management criteria and appropriate projects and management actions in a Plan, or to evaluate the efficacy of Plan implementation, and therefore may limit the ability to assess whether a basin is being sustainably managed. (23 CCR Section 351)
Undesirable Result	One or more of the following effects caused by groundwater conditions occurring throughout the basin: (1) Chronic lowering of groundwater levels indicating a significant and unreasonable depletion of supply if continued over the planning and implementation horizon. Overdraft during a period of drought is not sufficient to establish a chronic lowering of groundwater levels if extractions and groundwater recharge are managed as necessary to ensure that reductions in groundwater levels or storage during a period of drought are offset by increases in groundwater levels or storage during other periods. (2) Significant and unreasonable reduction of groundwater storage. (3) Significant and unreasonable seawater intrusion. (4) Significant and unreasonable degraded water quality, including the migration of contaminant plumes that impair water supplies. (5) Significant and unreasonable land subsidence that substantially interferes with surface land uses. (6) Depletions of interconnected surface water that have significant and unreasonable adverse impacts on beneficial uses of the surface water. (CWC Section 10721

Urban Water Management Plan	The plan adopted pursuant to the Urban Water Management Planning Act as described in Part 2.6 of Division 6 of the Water Code, commencing with Section 10610 et seq. (23 CCR Section 351)
Water Budget	The accounting of the total groundwater and surface water entering and leaving a basin including the changes in the amount of water stored. (CWC Section 10721)
Water Source Type	The source from which water is derived to meet the applied beneficial uses, including groundwater, recycled water, reused water, and surface water sources identified as Central Valley Project, the State Water Project, the Colorado River Project, local supplies, and local imported supplies. (23 CCR Section 351)
Water Use Sector	The categories of water demand based on the general land uses to which the water is applied, including urban, industrial, agricultural, managed wetlands, managed recharge, and native vegetation. (23 CCR Section 351)
Water Year	The period from October 1 through the following September 30, inclusive. (CWC Section 10721) or the period from October 1 through the following September 30, inclusive, as defined in the Act. (23 CCR Section 351)
Water Year Type	The classification provided by the Department to assess the amount of annual precipitation in a basin. (23 CCR Section 351)
Wellhead Protection Area	The surface and subsurface area surrounding a water well or well field that supplies a public water system through which contaminants are reasonably likely to migrate toward the water well or well field. (CWC Section 10721)

REFERENCES

California Code of Regulations. Title 23, Section 341.

California Code of Regulations. Title 23, Section 351.

California Department of Water Resources (DWR). 2003. Bulletin 118: California's Groundwater.

California Water Code. Division 6. Part 2.74. Section 10721. Chapter 2. Definitions. (Amended by Stats. 2018, Ch. 255, Sec. 1. (AB 1944) Effective January 1, 2019.)

Appendix 2A

Selected General Plan Goals and Policies

Goal or Objective	Policy or Action
Agriculture Element	
Goal AG-2: Maintain and enhance agriculture as the County's most critical land use, economic sector, and resource.	Policy AG 2-1: Agricultural-related industrial support operations shall be permitted on agricultural lands. Such uses may include, but are not limited to, processing, assembly, distribution and warehousing of agricultural materials and commodities and alternative energy systems that provide energy for on-site uses. These uses should be permitted on agricultural lands as principal permitted uses subject to the standards of the Zoning Ordinance provided the following findings are made:
	d. The operational or physical characteristics of the use will not have a significant adverse impact on water resources or the use or management of surrounding agricultural properties within at least a one-quarter (1/4) mile radius.
Objective AG 2-C: Preserve and Protect Water, Soil, and Natural Resources Necessary for Agricultural Operations	Policy AG 2-8: Support and promote water development projects which provide additional sources of water for agricultural uses. Policy AG 2-9: Support the procurement of expanded and additional water rights which provide for contractual supply reliability for agricultural use.
	Policy AG 2-10: Seek to increase the County's influence regarding water rights and distribution legislation at the state and federal level, to the greatest degree feasible for both surface water and ground water sources. This may occur through County support for local farm interest groups seeking to influence water-related legislation at the state and federal levels.
	Policy AG 2-11: Assist landowners in resolving water rights, water delivery, and water supply issues with other agencies such as the California Department of Fish and Game, the U.S. Army Corps of Engineers, the U.S. Bureau of Reclamation, and the California Department of Water Resources. Policy AG 2-12: Within conservation easements and habitat conservation lands, preclude the practice of fallowing fields for the purpose of water export.
	Policy AG 2-13: Encourage the reuse of treated wastewater for agricultural purposes.
	Policy AG 2-14: Preserve water resources for agriculture, both in quantity and quality, from competition with development, non-agricultural uses, mitigation banks, and/or interests from outside of the County.
	Policy AG 2-15: Promote best management practices in agricultural operations (including animal operations) to reduce emissions, conserve energy and water, and utilize alternative energy sources.
	Policy AG 2-16: Promote wildlife-friendly farm practices, such as tailwater ponds, native species/grassland restoration in field margins, hedgerows, ditch management for riparian habitat, and restoration of riparial areas in a manner consistent with ongoing agricultural activities, water delivery systems, reduction of pesticides, and other appropriate measures.
	Action AG 2-F: Coordinate with irrigation districts to identify cost-effective and feasible Best Management Practices for the application and use of water resources that address the range of agricultural activities in Colusa County. Work with entities such as the irrigation districts, Agricultural Commissioner, UC Extension Office, the Colusa County Resource Conservation District, and the Natural Resources Conservation Service to distribute Best Management Practices information to agricultural operations in the County.
	Action AG 2-G: Collaborate with water suppliers and wastewater treatment plant operators to increase th availability of treated or recycled water for agricultural purposes.
Community Character	
GOAL CC-2: Ensure that New Growth	Policy CC 2-6: Require new residential development to connect to municipal water and sewer services.
Addresses the Needs, Challenges and Opportunities Unique to Each Community	Policy CC 2-19: Prohibit lot splits or subdivision of land into new parcels smaller than two acres until centralized water and wastewater services are available.
	Policy CC 2-24: The use, expansion and development of private or mutually owned water and wastewater systems serving large-scale commercial and industrial land uses or multiple users shall be supported withit the Sphere of Influence, provided that the systems meet the requirements outlined in Policy PSF 1-26 and all applicable State regulations.
	Policy CC 2-25: Encourage urban residential development within the City's Sphere of Influence to connect to municipal sewer and wastewater service and discourage the use, expansion and development of privat or mutually owned water and wastewater systems serving residential uses within the Sphere of Influence.
	Policy CC 2-42: Require new urban development in Maxwell to connect to the municipal water and wastewater systems.
	Policy CC 2-47: Require new residential development in Princeton to connect to the municipal water and wastewater systems.
	Policy CC 2-57: Require applicants requesting land subdivisions or parcel splits in the Stonyford Lodge are to provide proof of adequate water supply for domestic use and fire protection. Additionally, sewage disposal meeting the County's standards and frontage for each parcel on a road built to County standards shall be ensured.
	Policy CC 2-60: Allow the subdivision of land designated Agriculture Transition (AT) and zoned Upland

Conservation, 10 acre minimum (UC-10) into 10 acre parcels, provided that the project can demonstrate sufficient roadway access, water supply, septic capacity, no significant aesthetic impacts, and that no significant risk associated with wildland fires or slope stability would occur.
Policy CC 2-67: Encourage urban residential development within the City's (Williams) Sphere of Influence to connect to municipal water and wastewater service.
Policy CC 2-69: Discourage the use, expansion and development of private or mutually owned water and wastewater systems serving residential uses within the Sphere of Influence (Williams)

Goal or Objective	Policy or Action
Conservation Element	
Goal CON-1: Conserve and protect Colusa County's ecosystem.	Policy CON 1-4: Encourage conservation, rather than preservation, through the active management of natural resources, including wildlife, water, air, minerals, forests, and land. Conservation and managemen techniques include replacing trees, crops, and other renewable resources at a pace that ensures they are not consumed more quickly than they can be replaced; use of non-renewable resources in a manner that ensures the resources are not depleted but available to future generations for use; strategic forest thinnin and fuels management to prevent wildfires; making resource areas accessible to the public while protecting resources from being diminished to non-recoverable levels; reducing incompatible wildlife/agricultural interface; and increasing public understanding and responsible use of resource conservation areas.
	Policy CON 1-7: Conserve and enhance those biological communities that contribute to the County's rich biodiversity including, but not limited to, blue oak woodlands, annual grasslands, mixed chaparral, pine woodlands, wetlands, riparian areas, aquatic habitat, and agricultural lands.
Objective CON-1B: Protect Endangered, Threatened and Special-Status Plant and Animal Species, their Habitats, and Other	Policy CON 1-13: Sensitive habitats include oak woodlands, wetlands, vernal pools, riparian areas, wildlife and fish migration corridors, native plant nursery sites, waters of the U.S., and other habitats designated b state and federal agencies and laws.
Sensitive Habitats	Policy CON 1-14: Require any proposed project that may affect special-status species, their habitat, or other sensitive habitat to submit a biological resources evaluation as part of the development review process. Evaluations shall be carried out under the direction of the Colusa County Department of Planning and Building and consistent with applicable state and federal guidelines. Additional focused surveys shall be conducted during the appropriate season (e.g., nesting season, flowering season, etc.), if necessary.
	Policy CON 1-15: Require that impacts to wetlands and riparian habitat protected by State or Federal regulations be avoided to the greatest extent feasible. If avoidance is not possible, fully mitigate impacts consistent with applicable local, State and Federal requirements.
	Policy CON 1-16: Require new development projects to incorporate measures that eliminate or avoid direct impacts to lakes, reservoirs, rivers, creeks, streams, wetlands, and other waterways to the greatest extent feasible. Measures may include, but are not limited to, appropriate setbacks or the implementation of best management practices approved by the Department of Planning and Building.
	Policy CON 1-17: All discretionary public and private projects that identify special-status species or sensitive habitats in a biological resources evaluation shall avoid impacts to special-status species and the habitat to the maximum extent feasible. Where impacts cannot be avoided, projects shall include the implementation of site-specific or project-specific effective mitigation strategies developed by a qualified professional in consultation with state or federal resource agencies with jurisdiction (if applicable) including, but not limited to, the following strategies:
	a. Preservation of habitat and connectivity of adequate size, quality, and configuration to support the special-status species. Connectivity shall be determined based on the specifics of the species' needs
	b. Project design measures, such as clustering of structures or locating project features to avoid known locations of special-status species and/or sensitive habitats.
	c. Provision of supplemental planting and maintenance of grasses, shrubs, and trees of similar qualit and quantity to provide adequate vegetation cover to enhance water quality, minimize sedimentation and soil transport, and provide adequate shelter and food for wildlife.
	d. Protection for habitat and the known locations of special-status species through adequate buffering or other means.
	e. Provision of replacement habitat of like quantity and quality on- or off-site for special status species.
	f. Enhancement of existing special-status species habitat values through restoration and replanting on native plant species.
	g. Provision of temporary or permanent buffers of adequate size (based on the specifics of the specia status species) to avoid nest abandonment by nesting migratory birds and raptors associated with construction and site development activities.
	h. Incorporation of the provisions or demonstration of compliance with applicable recovery plans for federally listed species.
	<i>i.</i> Monitoring of construction activities by a qualified biologist to avoid impacts to on-site special status species.
	Action CON 1-C: Review development project proposals, infrastructure projects, long range planning projects, and other projects that may potentially impact special-status species and sensitive resources to determine whether significant adverse impacts will occur. Where adverse impacts are identified, develop appropriate mitigation measures, in conformance with General Plan policies and relevant state and federal laws, to reduce or avoid impacts to the maximum extent feasible and practical.

	laws, to reduce or avoid impacts to the maximum extent feasible and practical.
	Action CON 1-D: Update the Zoning Ordinance to include standards to address significant impacts to special-status species and sensitive habitats consistent with Policies CON 1-13 through 1-18.
Objective CON-1C: Protect and Enhance Local Fisheries and Riparian and Aquatic Habitat	Policy CON 1-21: Protect riparian habitat along the Sacramento River in order to maintain suitable habitat for anadromous fish species, including salmon and steelhead trout, and for native sportfishing species
	Action CON 1-E: Coordinate with the California Department of Fish and Game to identify adversely impacted aquatic habitat within the County and to develop riparian management guidelines to be implemented by development, recreation, and other projects adjacent to rivers, lakes, reservoirs, and streams.

Table 1. Selected Colusa County General Plan Goals and Policies		
Goal or Objective	Policy or Action	
Objective CON-1D: Protect Surface Water Quality in the County's Lakes, Streams, Creeks and Rivers	Policy CON 1-22: Maintain lakes, rivers, streams, creeks, and waterways in a natural state whenever possible. These water features may be actively managed and/or improved or modified in order to function as natural flood protection and storm water management features during storms and flooding events.	
	Policy CON 1-23: Protect and enhance streams, channels, seasonal and permanent marshland, wetlands, sloughs, riparian habitat and vernal pools through sound land use planning, community design, and site planning.	
	Policy CON 1-24 : If a proposed project may result in impacts to wetlands or other Waters of the U.S., require the project proponent to consult with the appropriate regulatory agency and implement all applicable permit requirements as a condition of project approval.	
	Policy CON 1-25: Balance the needs of aquatic and riparian ecosystem enhancement efforts with flood management objectives.	
	Policy CON 1-26: Discourage development within 50 feet from the top of banks for all lakes, perennial ponds, rivers, creeks, sloughs, and perennial streams unless County-approved best management practices have been incorporated into the project's design in order to protect water quality and shoreline resources. Appropriate uses within the setback areas may include, but are not necessarily limited to: a. Fire and flood protection areas b. Maintenance of riparian habitat c. Recreational trails d. Vegetated landscaping e. Boat launch facilities Levees g. Docks h. Irrigation pumps	
	Policy CON 1-27: Encourage agricultural land owners to improve on-site storm water retention features and implement feasible Best Management Practices (BMPs) to reduce site runoff and provide for natural removal of water pollutants.	
	Policy CON 1-28: Support non-regulatory programs for protection of streams and riparian habitat, including education, technical assistance, tax incentives, and voluntary efforts to protect riparian resources.	
	Action CON 1-F: Continue to require implementation of the County's Grading Ordinance. Review projects to ensure that BMPs are implemented during construction and site grading activities as well as in project design to reduce pollutant runoff into water bodies.	
Objective CON-1E: Ensure a Sustainable and Long-Term Supply of Safe and Reliable Water	Policy CON 1-29: Support water development, treatment, and storage projects that are needed to meet existing and future local and regional demand.	
to Support the Needs of County Residents, Businesses, and Agricultural Operations	Policy CON 1-30: Ensure that regional, state, and federal water projects, including proposed Sites Reservoir, protect local water rights and areas of origin.	
	Policy CON 1-31: Encourage municipal water purveyors to install water meters and abandon flat-fee water use rate structures where feasible.	
	Policy CON 1-32: Demonstrate leadership in water conservation by including water-efficient plumbing and landscaping at all new County facilities, and by reducing the County's own water use to the extent possible.	
	Policy CON 1-33: Require new development and expansion of existing uses to incorporate best management practices for water use and include water conservation measures.	
	Policy CON 1-34: Encourage the use of water conservation measures for agriculture and in existing residences and businesses.	
	Policy CON 1-35: Encourage the use of water conservation measures, including low flow plumbing; reclaimed wastewater for non-potable uses; dual plumbing that allows grey water from showers, sinks, and washers to be reused for landscape irrigation in new developments; and native and drought-tolerant landscaping.	
	Action CON 1-G: Adopt a Water Efficient Landscaping Ordinance for residential, park, recreational, and commercial uses, based on the state model ordinance as amended to address local concerns. The ordinance should address: 1. Water-efficient landscape designs using low water-use plants. 2. Efficient irrigation systems. 3. Minimized turf areas. 4. Soil improvements and mulch. 5. Regular maintenance and adjustment of irrigation systems. 6. Scheduling irrigation during early or late hours. 7. Water budgeting, when necessary. 8. Education of residents, customers and employees regarding the importance of efficient water use.	
	Action CON 1-H: Continue to implement the policies, actions, and Basin Management Objectives (BMOs) contained in the Colusa County Groundwater Management Plan. Action CON 1-I: Continue to cooperate with Butte, Glenn, Tehama, Shasta and Sutter Counties through the Northern Sacramento Valley Integrated Regional Water Management Group, and continue to foster regional cooperation with other counties and water purveyors.	

Table 1. Selected Colusa County General Plan Goals and Policies		
Goal or Objective	Policy or Action	
Housing Element		
Goal HO-2: Provide Adequate Sites and Infrastructure to Accommodate the County's Housing Needs	Policy HO-11: Implement all policies and programs of the Housing Element with adequate consideration given to the protection of the County's agricultural and groundwater resources, and maintaining consistency with the County's Conservation Element of the General Plan.	
	Program HO 2-5 Provision of Public Services	
	The County will make every effort to ensure that infrastructure is available in a timely manner to accommodate development of its fair share of regional housing needs. Particular effort will be made to provide adequate infrastructure to accommodate the R-2, R-3, and R-4 sites in Arbuckle, Maxwell, Princeton, and the unincorporated area of Colusa.	
	The County will coordinate with the local water and sewer agencies to assist in planning for adequate water and sewer service. The County will take the following actions, as needed, to provide service to developing areas:	
	All Service Providers	
	 Each water and sewer provider will be mailed a copy of the Housing Element, upon its adoption, along with a letter that includes: 1) the text of Government Code Section 65589.7 requiring water and sewe providers to grant priority for service allocations to proposed developments that include housing units affordable to lower (including very low and extremely low) income households; 2) a summary of the County's regional housing needs allocation; and 3) specific actions the provider should take to ensure adequate service (see below for actions specific to each district/area in the County). 	
	Rural Areas	
	 Review potential treatment technologies that could be developed to provide water and sewer service for rural market-rate and affordable housing; develop performance standards for potential treatment technologies to assist public and/or private sewer and water providers in determining which will be most feasible in their locations within the County. • Allow a wide range of feasible alternative system sizes and treatment technologies to provide water and sewer service for rural market-rate and affordable housing. 	
	Program HO 2-6 Adequate Water and Wastewater Service for Subdivisions	
	Revise the Zoning Ordinance to ensure parcel map or subdivision map approval is dependent on demonstrated ability to provide potable water and meet septic capacity requirements.	
	Policy HO-18: Give priority for water service connections to extremely low, very low, and low income housing units in areas receiving water service from the County. Encourage local water and sewer providers to give priority to these lower income developments pursuant to Government Code Section 65589.7. Provide a copy of the Housing Element Update to local water and sewer providers upon its adoption.	
Land Use Element		
Goal LU-1: Maintain the efficient and harmonious use of land in the county, promoting a well organized and orderly development pattern, avoiding random, haphazard growth, protecting public health and safety, and accommodating the orderly and sustainable growth of employment and population.	Policy LU 1-4 : Locate lands designated for future development based on constraints associated with natural features, such as soil, slope, and drainage, preservation of the County's resources, including agriculture, open space, and scenic views, and by public service availability, such as sewer and water capability; policies and actions related to these requirements are set forth in more detail in the Safety, Conservation, and Public Facilities and Services Elements.	
	Action LU 1-D: Review development projects, consistent with the requirements of the California Environmental Quality Act and other applicable laws, to identify potential impacts associated with aesthetics, agriculture, air quality, circulation, community character, natural and cultural resources, greenhouse gases, public health and safety, water quality and supply, public services and facilities, and utilities and to mitigate of adverse impacts to the maximum extent that is feasible and practical.	
Objective LU-1C: Ensure a Streamlined and Equitable Process for Project Permitting and Outside Agency Coordination without Compromising the Enforcement of Local Land Use Regulations	Policy LU 1-27: Participate in countywide, regional and other multi-agency planning efforts related to agriculture, water supply, tourism, open space, air quality, housing, green infrastructure, recreation, habitat conservation, energy, emergency preparedness and flood protection to ensure that the needs of the County's residents and businesses are not overlooked.	
Goal LU-3: Ensure that Future Development Achieves the County's Goals of Agricultural Conservation, Rural Character, Growth Focused Around Existing Communities and Uses Sustainable Practices through Application of Development Requirements	Policy LU 3-1: Require proposed urban and rural residential development to be consistent with the following: <u>Rural Residential</u> • The soil is determined to be suitable for septic tank use by the Environmental Health Department	
	 Groundwater is determined to be sufficient to support a well by the Environmental Health Department 	
	 The parcel can be made accessible from a public street It can be demonstrated that the development is compatible with surrounding uses and will not hav 	

	 It can be demonstrated that the development is compatible with surrounding uses and will not have a significant, adverse effect on adjoining properties. The area is accessible for fire protection and can meet fire resistance guidelines if located in a high hazard area. It can be demonstrated that potable water is available.
Url	oan Residential
	• The community utility systems, including water, drainage, and sewer, if available, can accommodate the additional demand.
	The area has access to a major transportation route.
	The impact of the development on local streets can be mitigated to acceptable levels.
	Adequate fire protection measures are provided.
	• The site adjoins existing urban (residential, commercial, public facility, etc.) development.
	The project avoids the repetition of residential facades/designs within subdivisions.
	• The development is compact, is sensitive to natural resources, public safety, efficiently uses water and energy, maximizes bicycle and pedestrian opportunities, provides multimodal connections to nearby neighborhoods, bike/pedestrian routes and trails, and provides direct, safe routes to services, schools, and shopping.

Table 1. Selected Colusa County General Plan Goals and Policies	
Goal or Objective	Policy or Action
Objective LU-3B: Ensure that Reasonable Development Standards and the County's Rural Character and Quality of Life are Not Compromised in Efforts to Attract Commercial and Industrial Growth	 Policy LU 3-24: Require proposed industrial development to be consistent with the following: The area can be readily hooked up to public sewer and water facilities where these facilities are available, or to private sewer and water facilities where utilities do not yet exist. If the industry uses community utilities, that community systems can accommodate the added demand without additional costs to the existing community. If the project is to be served by groundwater wells, that reliable, scientific data be provided in the project development application that demonstrates that groundwater will be available under all conditions, including drought, that surrounding the wells will not have appreciable adverse effects on the quality and quantity of existing domestic and agricultural water supplies, and that private sewage disposal systems can comply with Environmental Health Department standards. The project will not significantly contribute to air, water, light, and noise pollution.
Open Space Element	
Objective OSR 1-B: Balance Open Space Preservation with Economic Development Needs	Policy OSR 1-9: Maintain open space for future water and drainage projects.
Public Services and Facilities Element	
Objective PSF-1A: Provide Safe, Reliable, and Environmentally Sound Water Services to Existing County Land Uses and Areas of Planned Growth	Policy PSF 1-3: Coordinate with water providers throughout the County to manage water supplies in a way that ensures adequate supplies for existing residents, agricultural uses, and businesses, and for projected growth, and avoids groundwater overdraft, water quality degradation and other adverse environmental impacts.
	Policy PSF 1-5: Facilitate, and to the extent feasible, assist with the development of new and reliable sources of water, consistent with County land use plans and regional water needs.
	Policy PSF 1-7: Priority is given to serving existing water uses over new water uses.
	Policy PSF 1-8: Require proof of an adequate (as defined by the County Environmental Health Division) potable water supply to serve the entire project prior to approval of any division of land or use permit.
	Policy PSF 1-11: New residential development on parcels two acres in size or smaller shall be required to connect to a public water system, with the exception of existing Rural Residential and Rural Service Center parcels which may be allowed to have an on-site well if approved by the County Department of Environmental Health.
Safety Element	
Objective SA 1-D: Take Appropriate Steps to Reduce the Risks to Life, Property, and Public Services Associated with Flooding.	Policy SA 1-27: Maintain adequate lands that can be used for groundwater recharge and storm water management. These lands may include parcels designated Agriculture General (AG), Designated Floodway (DF), and Resource Conservation (RC).
	Policy SA 1-35: Encourage and accommodate multi-benefit flood control projects that incorporate recreation, resource conservation, preservation of natural riparian habitat, and scenic values of the County's streams, creeks and lakes. Where appropriate and feasible, the County shall also encourage the use of flood and/or stormwater retention facilities for use as groundwater recharge facilities.

atural Resources	
griculture/Soils	
NRG-1 Preservation of agricultural land	NRP-3: Recognize the value of ricelands for waterfowl habitat, watershed management, and for groundwater recharge in an effort to preserve such lands and to maintain necessary water supplies in Glenn County.
	NRP-4: Support efforts underway to explore the potential to utilize ricelands as temporary storage reservoirs in the winter months, thus increasing groundwater recharge and supplies of surface water for both agriculture and wildlife, and potentially providing an alternative to rice straw burning.
	NRP-19: Support the erosion control programs, resource management programs, and agricultural conservation efforts of the Glenn County Resource Conservation District that benefit the county as a whole.
	Implementation Strategies, Programs and Priorities
	NRI-3: Encourage rice growers as well as other agricultural crop growers and cooperative to emphasize th value of rice land for waterfowl habitat, air quality enhancement, and groundwater recharge through promotions and advertisement.
	NRI-4: Monitor and participate in efforts of State and federal agencies and private conservation groups to find alternatives to rice straw burning, including winter flooding of fields.
	NRI-16: Establish a County notification process for requests to convert land from agricultural and grazing use to wetlands.
ater Resources NRG-2 Protection and management of loca	NRP-22: Oppose the exportation of groundwater resources outside the county.
water resources	NRP-22: Oppose the exportation of groundwater resources outside the county. NRP-23: Support legislation which will provide for a locally controlled Glenn County groundwater
	management district. NRP-24: Recognize the following local priorities when dealing with questions of ground and surface
	 water use: Highest: 1) Household/Domestic, 2) Agriculture, 3: Industrial/Commercial, 4) Wildlife/Conservation
	Lowest: 5) Exportation NRP-25: Protect groundwater recharge areas in the county from overcovering and contamination by
	 carefully regulating the type of development which occurs within these areas. NRP-26: Discourage onsite sewage disposal systems in areas with high groundwater recharge potential are eliminate existing concentrations of septic tanks in such areas through construction of community sewage
	treatment and disposal systems. NRP-27: Prohibit uses with the potential to accidentally discharge harmful groundwater pollutants in area
	of high groundwater recharge, unless appropriate mitigation measures have been incorporated into the operation of such uses.
	NRP-28: Identify and monitor potential sources of groundwater pollution, including harmful agricultural practices.
	NRP-29: Limit structural coverage and impervious surfaces within areas of high groundwater recharge through application of zoning that recognizes the importance of this feature.
	 NRP-30: Protect important watershed areas from poor development practices and potential degradation. NRP-31: Monitor actions taken at the State and federal level which impact water resources in order to evaluate the effects of these actions on the county's resources.
	NRP-33: Carefully study the potential impact that any future reservoir construction may have on groundwater recharge areas in Glenn County.
	NRP-34: Recognize the value of irrigation system infrastructure by discouraging development within established irrigation district boundaries which would prematurely reduce the utility of such systems.
	NRP-35: Encourage the development of water conservation programs by water purveyors for both agricultural and urban uses.
	NRP-36: Encourage development of educational programs to increase public awareness of water conservation opportunities and the potential benefits of implementing conservation measures and programs.
	NRP-37: Recognize that efforts to reserve water in Glenn County for wildlife may also bring long-term benefits to the effort to retain water resources locally.
	NRP-38: Recognize the impacts of gravel extraction on groundwater quantity and quality and encourage extraction methods that preserve and enhance groundwater resources.
	Implementation Strategies, Programs and Priorities NRI-18: Establish a local groundwater management program including strategies for advancing State
	legislation supportive of a locally controlled groundwater management district. NRI-19: Apply the priorities for water consumption included in this General Plan when reviewing discretioner.
	discretionary actions. NRI-20: Establish an overlay designation to provide appropriate protections for areas of the county where aroundwater recharge accurs, such as limitations on overcovering of soils with imponvious surfaces. To
	groundwater recharge occurs, such as limitations on overcovering of soils with impervious surfaces. To provide for appropriate groundwater protection, new zoning proposals that could result in residential lot less than one acre should not be approved until a sewer system is available. Consult with the State Department of Water Resources, the Glenn County Health Department and the Glenn County Planning Department, and incorporate protective measures into the <i>Glenn County Zoning Code</i> .
	NRI-22: Work with State and federal agencies to improve local groundwater pollution detection and monitoring.
	NRI-23: Amend County ordinances to include development standards, as contained in this <i>General Plan</i> , which protect watershed areas, and coordinate application of the standards with the U.S. Forest Service and other agencies.
	 NRI-24: Monitor and participate in efforts of the Bureau of Reclamation and Army Corps of Engineers to study the impacts of additional reservoir construction and of reservoir siltation. NRI-25: Develop and actively seek funding to develop water conservation and educational programs.

Goal or Objective	Policy or Action
NRG-3 Preservation and enhancement of the county's biological resources in a manner compatible with a sound local economy.	NRP-39: Approach the retention and enhancement of important habitat by preserving areas or systems which will benefit a variety of species or resources rather than focusing on individual species, resources or properties.
	NRP-41: Preserve natural riparian habitat, especially along Stony Creek and the Sacramento River and Butte Creek.
	NRP-42: Eliminate the E-M (Extractive Industrial) Zone from areas containing natural riparian vegetation/habitat and replace it with a category affording greater protection to stream courses and riparian habitats.
	NRP-46: Promote protection of native biological habitats of local importance such as riparian forests, foothill oak woodlands, Stony Gorge and Black Butte Reservoirs.
	NRP-50: Recognize the Sacramento River corridor, the Sacramento National Wildlife Refuge, migratory deer herd areas, naturally occurring wetlands, and stream courses such as Butte and Stony Creeks as areas of significant biological importance.
	NRP-53: Direct development away from naturally occurring wetlands to the extent such policy is consisten with the concept of compact and contiguous development.
	NRP-61: Support efforts to improve water availability and management when the potential exists to benefit fish and wildlife in cooperation with Glenn County agricultural water users.
	Implementation Strategies, Programs and Priorities
	NRI-27: Amend the <i>Glenn County Zoning Code</i> to include a Streamside Protection Zone and rezone those areas along stream courses currently zoned E-M (Extractive industrial Zone) in accordance with a locally prepared riparian zone management plan.
	NRI-32: Meet with the U.S. Fish and Wildlife Service to determine if there is interest in establishing buffer areas around the Sacramento National Wildlife Refuge and other areas of biological importance, and how the federal government would participate in their formation.
	NRI-34: Identify biologically important areas, such as the Sacramento River Corridor, Sacramento National Wildlife Refuge, deer herd ranges, naturally occurring wetlands, and stream courses such as Butte and Stony Creeks, and show them as constraints to development in this <i>General Plan</i> (Reference Biological Importance Overlay and Restorable Wetlands Overlay).
Public Safety	
Water Quality	
PSG-6 Protection and enhancement of water quality.	PSP-43: Support ongoing regulatory and compliance efforts at the federal and State level for the protectio of water quality.
	PSP-45: Zone floodways and stream channels in a manner that promotes protection of water quality.
	PSP-47: Support the preparation of area groundwater studies to the protection of groundwater and t ensure that the holding capacity of the area is not exceeded.
	Implementation Strategies, Programs and Priorities
	PSI-42: Sponsor and assist with educational efforts which have as a goal greater public awareness and compliance with established water quality standards.
Community Development	
Land Use/Growth	
CDG-2 Avoidance of land use conflicts in agricultural areas.	P-45: Discourage urban growth in floodplains, aquifer recharge areas, scenic and historic sites, or other sensitive areas as specified in this General Plan.
	CDP-17: Encourage agricultural water suppliers to make changes in their service requirements to increase the minimum sized parcel to be served in agricultural areas to ten (10) acres, and recommend that new parcels created within water supply district boundaries which are less than ten (10) acres in size be detached from the district(s), except for the Orland Unit Water Users' Association, for which the minimum size shall be 5.01 acres.
	CDP-18: Within the Orland-Artois Water District, approve no zone changes allowing parcels smaller than twenty (20) acres in size, and approve no tentative maps for parcels less than twenty (20) acres in size.
	Implementation Strategies, Programs and Priorities
	CDI-10: Contact agricultural water suppliers and formally request establishment of a ten (10) acre minimum parcel size for agricultural water service.
	CDI-11: Apply zoning to properties located within the Orland-Artois Water District that reflects a minimum parcel size of twenty (20) acres or larger.
Public Services and Facilities	1
CDG-17 Provision of adequate and cost-effective public services.	CDP-129: Maintain coordination and cooperation between the County and water purveyors, and encourage special districts to comply with State law by referring capital projects to the County for review

and evaluation for consistency with the General Plan.

Implementation Strategies, Programs and Priorities

CDI-83: Convene a task force composed of representatives of Glenn County and the cities of Willows and Orland to formulate a memorandum of understanding which establishes uniform polities and standards for building construction, public utility connections, sewer and water service, and other matters related to cost-effective development of unincorporated areas within city urban limit lines.

CDI-88: Request LAFCO to initiate and undertake studies of existing special districts and cities which include inventorying those agencies and determining their maximum service area and service capacities.

CDI-89: Request LAFCO to adopt standards and procedures for the evaluation of service plans submitted by cities and special districts with annexation/reorganization applications.

CDI-94: Request the Environmental Health Department to review minimum parcel size standards for areas without public or community water service for adequacy as new information becomes available e.g. soil surveys, new regulations.

Table 3. Selected City of Colusa General Plan Goals and Policies	
Goal or Objective	Policy or Action
Land Use Elements	
Comprehensive Planning Goal LU-6: To provide a comprehensive, logical land use planning process rather	Policy LU-6.3: Growth shall be managed to ensure that adequate public facilities and services are planned for and provided in a manner that protects the public's health, safety, and welfare.
than an incremental, piecemeal approach.	Implementing Actions
	Implementing Action LU-6.3.e: Water Master Plan The City will adopt and implement a Water Master Plan. Development projects will be evaluated for consistency with this plan. The plan will provide a framework for timed capital improvements and facility expansion projects and will aid the City in identifying and establishing funding sources beyond monthly service charges to finance improvements related to water quality, supply, recycling, distribution, and water conservation. Municipal water is discussed is discussed in detail in the Municipal Facilities and Services Element.
	Implementing Action LU-6.3.f: Wastewater Master Plan The City will adopt and implement a Wastewater Master Plan. Development projects will be evaluated for consistency with this plan. The plan will provide the framework for timed capital improvements and facility expansion projects and will identify funding sources beyond monthly service charges to finance improvements related to expansion and upgrades to wastewater capacity, flow, treatment, and reclamation. The City will refer to this plan when constructing improvements and upgrades to the Wastewater Treatment Plant as needed to accommodate existing customers and any approved development. Wastewater is discussed in detail in the Municipal Facilities and Services Element.
	Implementing Action LU-6.3.g: Storm Drainage Master Plan The City will adopt and implement a Storm Drainage Master Plan. Development projects will be evaluated for consistency with this plan. The plan will identify drainage facilities that will be constructed to eliminate drainage problems in the City and will describe the means for financing the improvements. The Storm Drainage Master Plan will address Regional Water Quality Control Board water quality standards, including Best Management Practices for storm drainage management. Storm drainage is discussed in detail in the Municipal Facilities and Services Element.
Community Character and Design	
Environmental Sustainability	
Goal CCD-2: To ensure that new development respects the natural environment.	Policy CCD-2.2: New development shall respect the contours of drainage ways as important recognizable features of the City.
	Implementing Actions
	Implementing Action CCD-2.2.c: Improvement Standards The City will update and adopt improvement standards to be applied to improvements and private works to be dedicated to the public and accepted by the City for maintenance or operation, as well as improvements to be installed within existing rightsof-way and easements. These standards shall serve to regulate and guide the design and preparation of plans for street construction, alleys, drainage, sewer, street lighting water supply facilities, and related public improvements.
	Policy CCD-2.5: The City shall ensure that infrastructure improvements demonstrate sensitivity to any natural systems affecting a project site.
	Policy CCD-2.5: The City shall ensure that infrastructure improvements demonstrate sensitivity to any natural systems affecting a project site.
	Implementation Actions
	Implementing Action CCD-2.5.b: Development Review Impacts of proposed new development will be evaluated with each proposal. Mitigation of significant impacts to the natural environment, including biological resources, water quality and air quality, will be required as part of the development review process. Mitigation measures to minimize impacts on these natural resources will be implemented as appropriate.
Safety Element	
Goal SAF-2: To minimize the potential for loss of life and damage to property due to flooding.	Policy SAF-2.2: The City shall minimize the potential for flood damage to buildings and other structures, particularly from storm water runoff.
	Implementing Actions
	Implementing Action SAF-2.2.a: Storm Drainage Master Plan The City will adopt a Storm Drainage Master Plan for Colusa. The Master Plan will identify drainage facilities that will be constructed to eliminate or mitigate drainage problems in the City, and describe the means for financing the proposed improvements. The Storm Drainage Master Plan will be consistent with any Capital Improvements Plan prepared by the City and will address Regional Water Quality Control Board water quality standards, including Best Management Practices for storm drainage.
	 Implementing Action SAF-2.2.b: Development Review The City will require new development to ensure that the cumulative rate of peak runoff does not exceed pre-development levels. New development and redevelopment of existing sites will provide storm water detention or retention facilities (on- or offsite), if necessary, to prevent flooding due to runoff or where existing storm drainage facilities are unable to accommodate increased storm water drainage. Implementing Action SAF-2.2.c: Ordinance and Regulation Review and Update The City will review and
	revise its Subdivision Ordinance as needed to incorporate specific data and design requirements related to storm water drainage that are contained in this General Plan update.
Parks, Recreation and Resource Conservation	
Water Quality and Water Conservation Goal PRC- 9: To manage and protect the City's water resources.	Policy PRC – 9.1: The City shall require natural drainage flows be maintained in new development projects to the greatest extent feasible.
	Implementing Action Implementing Action PRC-9.1.a: Development Review As part of the development review process, the City will review individual projects to determine the setback requirements that will adequately buffer natural drainage corridors from development. The City will require that new development protect natural drainage corridors and other watercourses from the adverse effects of construction activities and urban runoff.

Goal or Objective	Policy or Action
	Policy PRC- 9.2: The City shall periodically review the status of the City's groundwater resources.
	Implementing Action
	Implementing Action PRC-9.2.a: Water Resources Report The City will prepare a Water Resources bi-annual report to the City Council. This report, in part, will include an analysis of groundwater resources. The City will use this report to ensure groundwater resources are protected from contamination and overdraft. As part of the Water Resources Report, the Public Works Department will analyze the quality of drinking water in the City. The City will encourage activities that maintain and improve drinking water quality.
	Policy PRC – 9.3: The City shall maintain its ability to meet its water supply requirements. Implementing Action PRC-9.3.a: Development Review As part of the development review process, the City will evaluate the incorporation of water conservation techniques in all new development.
	Implementing Action
	Implementing Action PRC-9.3.b: Development Impact Fees (see Implementing Action MFS-1.1.b).
	Policy PRC-9.4: The City shall encourage the use of treated wastewater and other non-potable water sources for irrigation and groundwater recharge.
	Implementing Actions
	Implementation Action PRC-9.4.a: Landscape Ordinance The City will adopt and implement a landscape ordinance, which will establish standards for water-conserving landscaping in order to reduce water use in developed areas. Requirements will specify the use of reclaimed water, trees, and other vegetation. This ordinance will be applied in the design and development of private and public development projects and will be consistent with the provisions of the General Plan.
	Implementation Action PRC-9.4.b: Interagency Coordination In cooperation with the Colusa County Water District, the City will identify and develop opportunities for reuse of non-potable water, including reclaimed water, for non-domestic uses.
Aunicipal Facilities	
Vater System	
Goal MFS – 7: To maintain and enhance a water system that meets the needs of	Policy MFS-7.1: The City shall establish development standards and plans to ensure that the water treatment and delivery system is not unduly burdened by new development.
existing and future residents of Colusa.	Implementing Action
	Implementing Action MFS-7.1.c: Water Master Plan The City will prepare and implement a Water Master Plan to provide a framework for timed capital improvements and facility expansion projects. The plan will aid the City in identifying and establishing funding sources beyond monthly service charges to finance improvements related to water quality, supply, recycling, distribution, conservation, and other issue areas identified issue areas identified by the City and the plan. The plan will evaluate the depth, size, recharge rate, and capacity of the aquifer to accommodate the City's projected future growth. The plan will also make determinations regarding the need to develop additional water sources during the planning period of this General Plan.
	Policy MFS-7.2: To minimize the need for the development of new water sources and facilities and to minimize sewer treatment needs, the City shall promote water conservation in City operations and in private development. The City shall annually monitor water usage to assess the effectiveness of the water conservation program.
	Implementing Action MFS-7.2.a: Water Master Plan The City will implement a water conservation program to be defined and incorporated in its Urban Water Management Plan, to be prepared with the Water System Master Plan. If groundwater levels decline and/or if the "moderate" program does not achieve its intended results, the City will implement the "aggressive" or "maximum" water conservation program as defined in the Water Management Plan.
	Policy MFS-7.3: The City shall, to the extent practical, require the use of drought-tolerant plant species and water efficient irrigation systems in the landscaping of new public and private open space areas, common areas, and parks.
	Implementing Action MFS-7.3.a: Development Review Through review of development projects, the City will condition development, where practical, on water conservation practices.
Stormwater Drainage System	
Goal MFS – 9: To provide adequate stormwater drainage for all existing and	Policy MFS-9.1: The City shall ensure its stormwater drainage system is upgraded in phases to adequately accommodate drainage resulting from new development prior to project construction.
future development.	Implementing Action
	Implementing Action MFS-9.1.a: Storm Drainage Master Plan The City will prepare and adopt a Storm Drainage Master Plan for Colusa. The Master Plan will identify drainage facilities that will be constructed to eliminate existing drainage problems and avoid future drainage problems in the City and describe the

means for financing the improvements. The Storm Drainage Master Plan will be consistent with any Capital	
Improvement Program prepared by the City and address Regional Water Quality Control Board water	
quality standards, including Best Management Practices for storm drainage.	
	means for financing the improvements. The Storm Drainage Master Plan will be consistent with any Capital Improvement Program prepared by the City and address Regional Water Quality Control Board water quality standards, including Best Management Practices for storm drainage.

eliminate existing drainage problems and avoid future drainage problems in the City and describe the

Table 4. Selected City of Williams General Plan Goals and Policies	
Goal or Objective	Policy or Action
and Use and Character	
Achieving a Quality Community Charact	er
	Policy 3.27: The land use plan and zoning districts will address for the character of development, which accounts for the design/intensity of development, the arrangement of buildings and parking areas, and the preservation of open space.
	Actions
	3.hh. Establish minimum open space standards within each district, which may be used for storm water detention, resource protection (e.g. riparian buffers along streams), bufferyards, and/or parks, trails, and open space. The amount of private or common open space relates to the character of development. For instance, in the Agriculture and Estate Residential districts, there is a high proportion of private open space whereas the Suburban Residential and Urban Residential districts have increasing percentages of common (public or semipublic) open space.
	3.jj . Incorporate development options within each zoning district. Different lot sizes and percentages of open space maintain the district character while allowing market flexibility and adjustment to site conditions. In other words, a smaller lot may be used and clustered to set aside adequate open space to preserve agricultural resources, such as the orchards, or to fulfill the City's storm water management objectives. A comparable density and character is achieved.
Service Provision	
	Policy 3.41: The City's land use pattern shall focus new development and significant redevelopment where adequate public services and utility capacity are already in place or projected for improvement, including streets, water, wastewater, and drainage infrastructure.
Environmental Sensitivity, Resource Prot	tection, and Flood Prevention
	Policy 3.45: Sensitive resources, including floodplains, wetlands, riparian buffer areas along stream channels, and valued view sheds, will be protected and preserved.
	Policy 3.50:. The City will consider the location of natural resources to be used for groundwater recharge and stormwater management.
Public Safety	
Flood Protection	
	Policy 4.9: The design of drainage improvements will be sensitive to community aesthetics, aquatic habitat recreation (trails, playing fields), wetlands, and water quality mitigation.
	Policy 4.10: The City will encourage design strategies to reduce the impact of impervious surfaces on storm water quality through the use of water gardens, rain barrels or cisterns, pervious pavement, vegetated swales, swale blocks, and green roofs, among others.
	Actions
	4.d. Maintain a Flood and Drainage Master Plan that addresses the following, at a minimum:
	 Storm water and drainage improvements for all sections of the City that are needed to accommodate planned growth;
	 Coordination with irrigation districts, the County and other affected flood control agencies to develop uniform standards for irrigation and storm water conveyance infrastructure; and
	 Standard measures used for new development to address localized flooding, such as measures to avoid off-site drainage impacts from adjacent agricultural operations.
	4.e. At the time the City reaches a size by which it is required to comply with Section 402(p) of the Federal Clean Water Act, prepare a Storm Water Management Plan (SWMP) to fulfill the requirements for improving the quality of storm water discharges from Small Municipal Separate Storm Sewer Systems (MS4) for Phase II municipalities.
	4.f. Begin identifying Best Management Practices (BMPs), particularly construction site storm water runoff control and post-construction storm water management, to reduce the discharge of pollutants to the storm water system. These should be integrated as standards into the City's subdivision regulations.
	4.g. Through improved land development practices and regulations, establish a hierarchy for managing storm water with the following priorities: minimize impervious surfaces, attenuate flows by use of open, vegetated swales and natural depressions and preserve existing natural stream channels, infiltrate runoff 3, provide storm water retention and then detention structures, provide velocity dissipation structures or channel design, and construct storm sewers.
	4.m. Investigate the feasibility of the alternatives outlined in the Preliminary Technical Memorandum for Flood Hazard Mitigation Study Project Alternatives. The structural alternatives include improving the conveyance capacity of Freshwater and Salt Creeks and the supporting network of drainage laterals, replacing bridge crossings to remove obstructions, constructing diversion dams to channel flows away from the City, constructing flood detention and multi-purpose flood retention reservoirs, constructing levees to the west and north of the City with removable floodwall sections, and elevating existing structures. The non-structural alternatives include land acquisition, cropland storage, channel restoration.

structures. The non-structural alternatives include land acquisition, cropland storage, channel restoration,	
upland re-vegetation, and improved maintenance of stream channels.	

Table 4. Selected City of Williams General Plan Goals and Policies	
Goal or Objective	Policy or Action
Public Facilities	
Water, Wastewater, and Storm Drainag	e
	Policy 5.1: The City of Williams will provide utilities concurrently with development.
	Actions
	5.b. Continue developing the City's Capital Improvement Program (CIP) to repair and replace aging and deteriorated sewer lines, which will improve the flow efficiency, reduce inflow and infiltration into the collection and treatment systems, and help to mitigate ground water impacts.
	5.c. Execute plans to install a new water well.
	5.d. Further develop plans for a second water storage tank.
	5.e. Amend the zoning ordinance to include ground water protection measures in site development standards. Include open space provisions in the density standards.
	5.f. Amend the subdivision ordinance to include ground water protection measures in future subdivisions.
	5.g. In accordance with AB 1881, the Water Conservation Landscape Act of 2006, develop water efficient landscaping standards for new development to include:
Open Space and Conservation	 Requirements for specific species of plantings; Prohibition of invasive species; Submittal requirements for landscaping and irrigation plans (and requirement for both to be installed per approved plans); Landscaping and hardscaping to be designed based on "hydrozone" specifications; Provision for recirculating and recycling water systems; Requirements for a soil report with recommendations regarding the most efficient types of planting and irrigation for the specific soil types existing on a site; Specific "plant factors" in compliance with state standards for high, medium and low water using plantings; and Irrigation to be designed according to hydrozone needs. 5.k. Incorporate into City standards and specifications means for addressing storm water quality, including a first preference for nonstructure best management practices such as bioretention, vegetated swales and buffer strips, constructed wetlands, and other environmentally sensitive design and construction practices
Vegetation	
	Policy 7.24: Preference will be given to native and drought-tolerant plant species to reduce water consumption, minimize invasive species, and preserve the appearance of the natural landscape.
	Actions
	7.zz Consider provisions in the subdivision regulations may require riparian buffers around all naturally occurring water bodies and wetlands. The standards shall restrict septic systems within the buffer area and include requirements for planting indigenous plants and trees to enhance the buffer's absorption and filtering potential. 7.aaa Include the use of bio-swales and permanent water features for drainage management to reduce the volume and rate of stormwater runoff from new developments. 7.bbb Support green roofs on new developments as a method of stormwater mitigation, as well as reduction of the urbar "heat island" effect. For new construction, the use of green roofs shall result in a reduction in the extent of stormwater facilities that need to be constructed to meet standards. 7.ccc The City will identify areas that may accommodate floodwater for the purposes of groundwater recharge and stormwater management.

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Table 5. Selected City of Orland General Plan Goals and Policies	
Goal or Objective	Policy or Action
Safety Element	
Subsidence	
	Policy 4.6.C: Applications for projects that extract groundwater, oil, or gas shall include a report evaluating the potential for resulting subsidence. Reports shall discuss appropriate mitigation measures to reduce the potential for subsidence.
Open Space, Conservation, and Public Facilities	Element
Water Quality	
Goal 5.6: Conserve, enhance, and manage water resources, protect their quality, and	Policy 5.6.A: Ensure that new development complies with State and federal regulations and standards in order to maintain and improve water quality.
ensure an adequate long-term supply of water for domestic, agricultural, industrial, and recreational use.	Program 5.6.A.1: The City shall require applicants for new development projects to adhere to RWQCB discharge standards, including identifying specific measures for minimizing project related erosion and resulting siltation of surface water features.
	Programs
	Program 5.6.A.2: The City shall require that a grading and erosion control plan be submitted with each tentative parcel and tentative subdivision map prior to action by the City. Standard RWQCB best management practices (BMPs) shall be incorporated in these plans as a means to control runoff and minimize erosion impacts.
	Program 5.6.A.3: The City shall ensure that new development has a minimal impact on natural drainage channels and flow capacity.
	Policy 5.6.B: Reduce the potential for sediment and other pollutants to contaminate surface and ground water resources.
	Programs
	Program 5.6.B.1: Where feasible, the City shall maintain the natural condition of waterways and floodplains and protect watersheds to ensure adequate ground water recharge and water quality.
	Program 5.6.B.2: The City shall require that new development at a density greater than one unit per acre and commercial and industrial areas annexed to the City be connected to the City's wastewater collection system. Existing residential development and individual homes where septic systems have failed also may be connected to the system.
	Program 5.6.B.3: The City shall review City standards for drainage structures and, if determined appropriate, adopt requirements for grease and sediment traps for roads and parking lots to improve water quality of urban runoff.
	Policy 5.6.C: Explore the use of pervious concrete/pavement to allow the continued filtration of groundwater into the soil.
	Policy 5.6.D: Encourage the use of site design techniques for non-residential uses that provide for the discharge of on-site stormwater into landscaped basins or swales prior to discharge to the City's storm drainage system.
	Policy 5.6.E: Encourage water conservation as a means of conserving not only water but also minimizing energy consumption and costs associated with pumping and delivery systems.
Water Supply	1
Goal 5.7: Protect the quantity and quality of community water supplies	Policy 5.7.A: Ensure that groundwater resources in the vicinity of Orland are protected from contamination.
	Programs
	Program 5.7.A.1: The City shall require wells located on land annexed to the City and served by City water service to be properly abandoned or all possibility of cross connection with the City water system eliminated in accordance with Glenn County Health Department guidelines.
	Program 5.7.A.2: The City shall ensure that all City wells are operated and maintained to meet California Department of Health Services standards for public drinking water supplies.
	Policy 5.7.B: Avoid the wasteful use of water within the planning area. Program 5.7.B.1: The City shall promote the use of water-conserving devices and practices in both new construction and major alteration and additions to existing buildings.
Stormwater Drainage System	
Goal 5.9: Provide for the collection, transport, and stormwater in a safe manner to protect people and property from damage arising from storm drainage.	Policy 5.9.A: Require new development to ensure that the cumulative rate of peak runoff does not exceed pre-development levels.
	<u>Programs</u> Program 5.9.A.1: New development and redevelopment of existing sites should provide storm water detention or retention facilities (on- or offsite), if necessary, to prevent flooding due to runoff or where existing storm drainage facilities are unable to accommodate increased storm water drainage.

existing storm drainage facilities are unable to accommodate increased storm water drainage.

Program 5.9.A.2: The City shall review and revise its Zoning and Subdivision Ordinances, as needed, to incorporate specific data and design requirements related to stormwater drainage that are contained in this general plan.

Program 5.9.A.3: The City shall complete its Storm Drainage Master Plan.

Policy 5.9.B: Minimize the potential for flood damage to buildings and other structures, particularly from storm water runoff.

Programs

Program 5.9.B.1: The City shall explore the use of pervious concrete and pavement to assist in the return of water to the regional aquifer and to assist in the management of storm drainage.

Program 5.9.B.2: The City shall encourage the use of landscaped bioswales to filter oil and other pollutants from stormwater drainage.

Program 5.9.B.3: The City shall consider the use of filtered storm drainage inlets to screen pollutants from drainage waters.

Table 6. Selected City of Willows General Plan Goals and Policies	
Goal	Objective, Policy or Implementation
Land Use Element	
Development	
DPS-1 Goal: Accommodate and plan for	Objective:
new growth.	During the life of this plan, maintain flexibility and responsiveness to the changing conditions and opportunities for development.
	Policy:
	The City should only approve development proposals that are consistent with this plan.
Community Services, Facilities, and Infrastructur	e
DPS-4 Goal: Adequate community services,	Objective:
facilities, and infrastructure.	Maintain existing services, facilities, and infrastructure, and provide for expansion, extension, or upgrades to meet the needs of new development without adversely impacting existing levels of service or the revenues required to provide them.
	Policy:
	Before approving a development proposal, the City should determine through the California Environmental Quality Act (CEQA) process that a proposed project will not adversely impact existing community services, facilities, and infrastructure The City Council should determine that revenues are, or will be, available to maintain and/or expand, extend, or upgrade services related to new development.
High Groundwater	
DPS-13 Goal: Protect water quality.	Objective:
	Prevent septic system failure and ground water contamination in high groundwater areas.
	Policy:
	The City Council should only approve projects in the high ground water areas that will be served by city sewers.

Appendix 2B

Example of Comment Tracking System

Appendix 2C

Distribution Lists of GSA-specific Beneficial Users

Note: some information has been redacted for confidentiality purposes and GSA commitments.

Appendix 2D

Example Meeting Workshop and Flyers

Appendix 2E

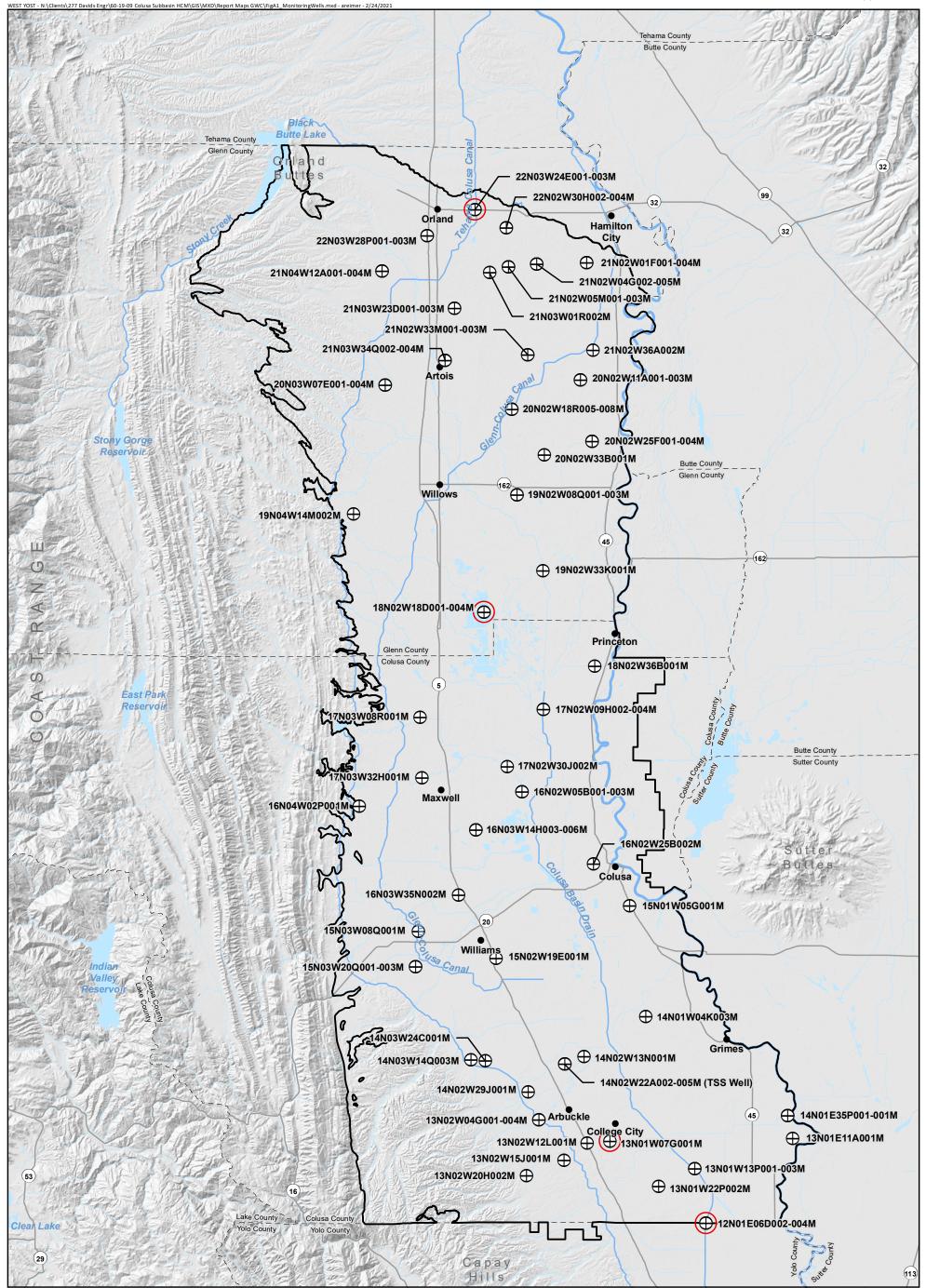
Engagement Matrix

Appendix 2F

Beneficial User Input and Decision Making Development

Appendix 3A

Monitoring Network Groundwater Elevation Hydrographs



Groundwater Monitoring Well with Hydrograph

Representative Well Hydrograph Used in Report Text

Colusa Subbasin

Horizontal Datum: North American Datum of 1983 (NAD 83), California State Plane Zone II, feet.

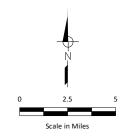
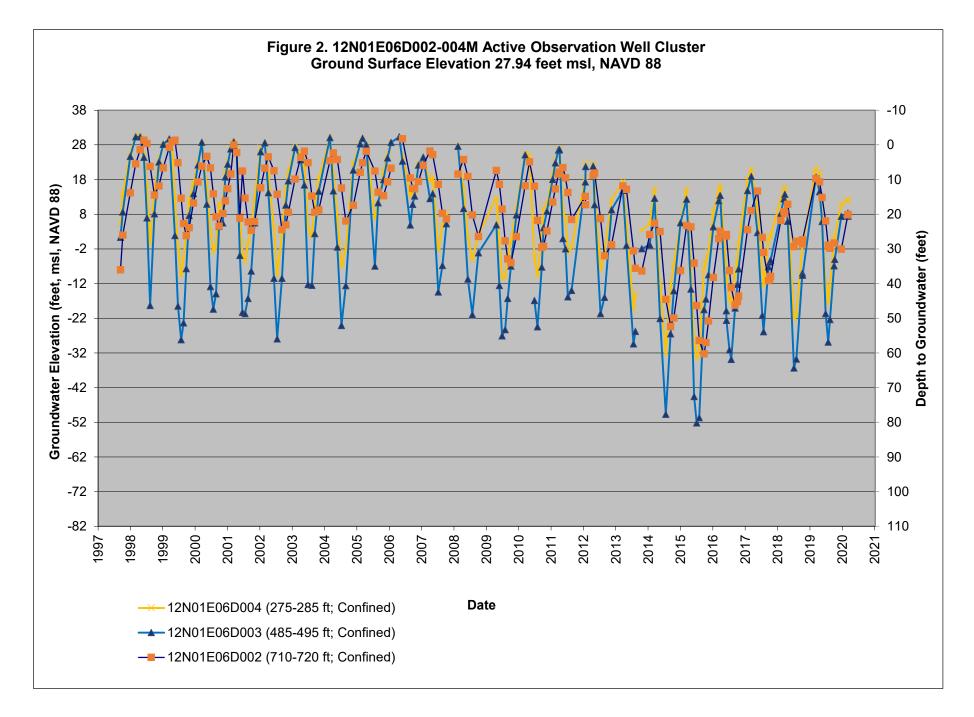
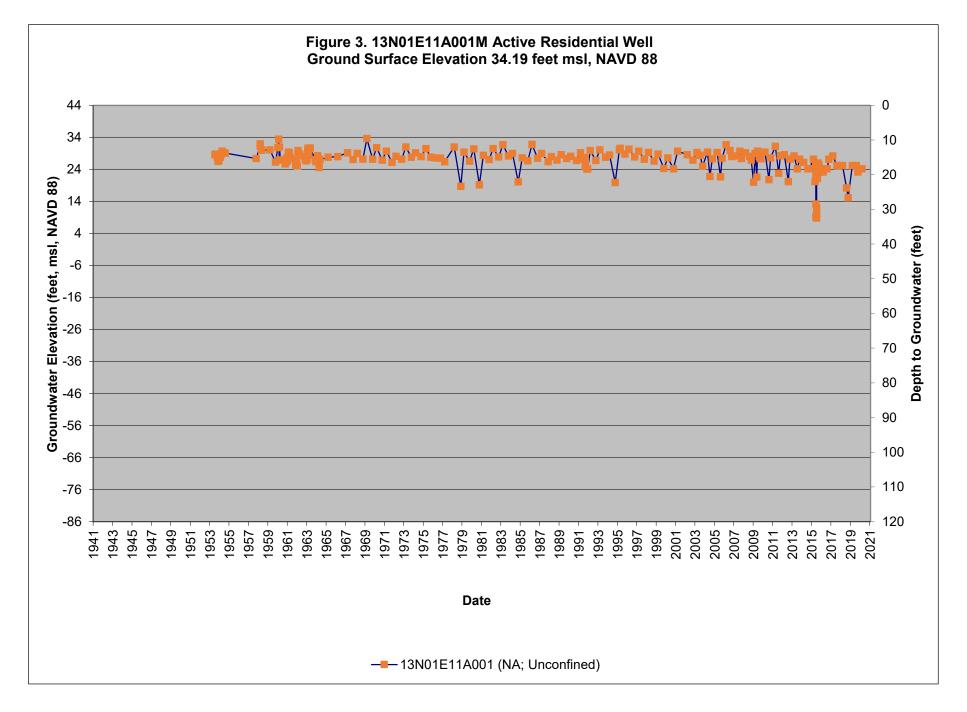


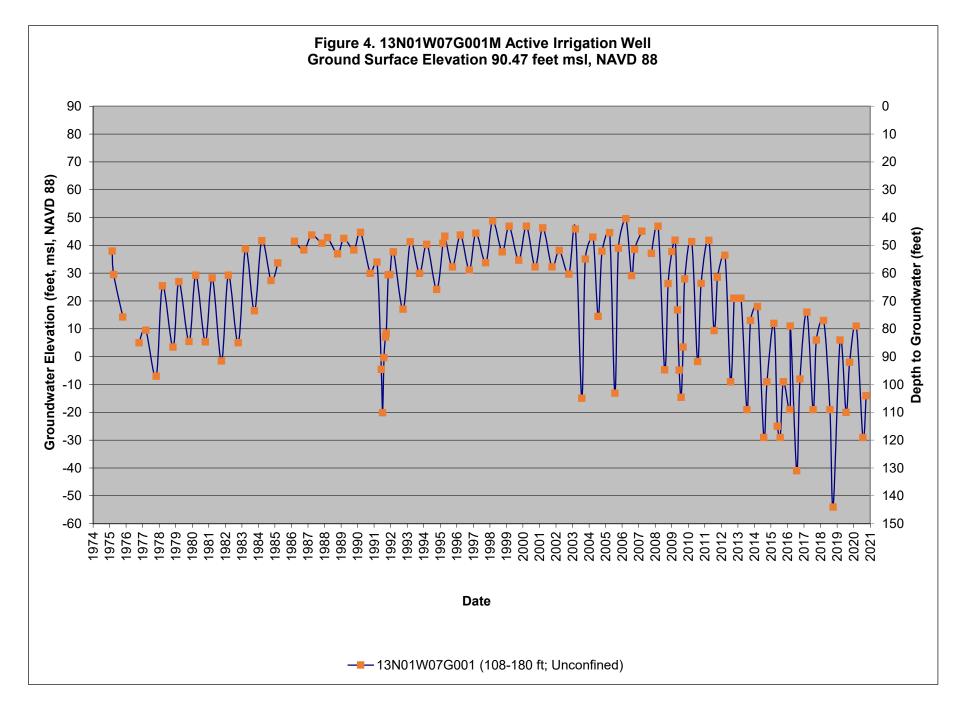
Figure 1

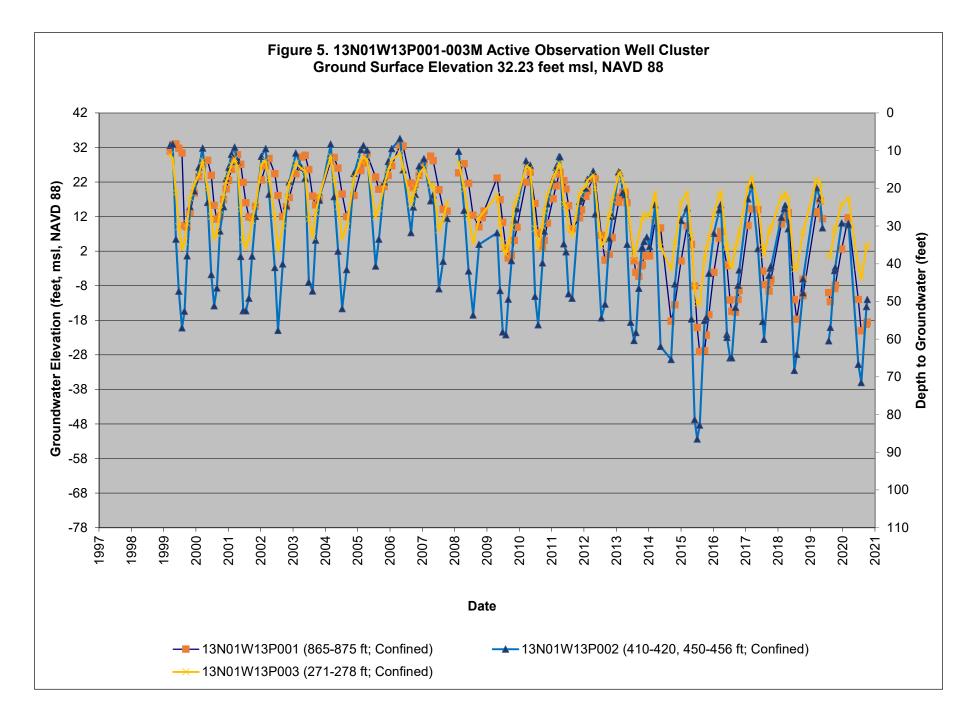
Groundwater Monitoring Wells with Hydrographs

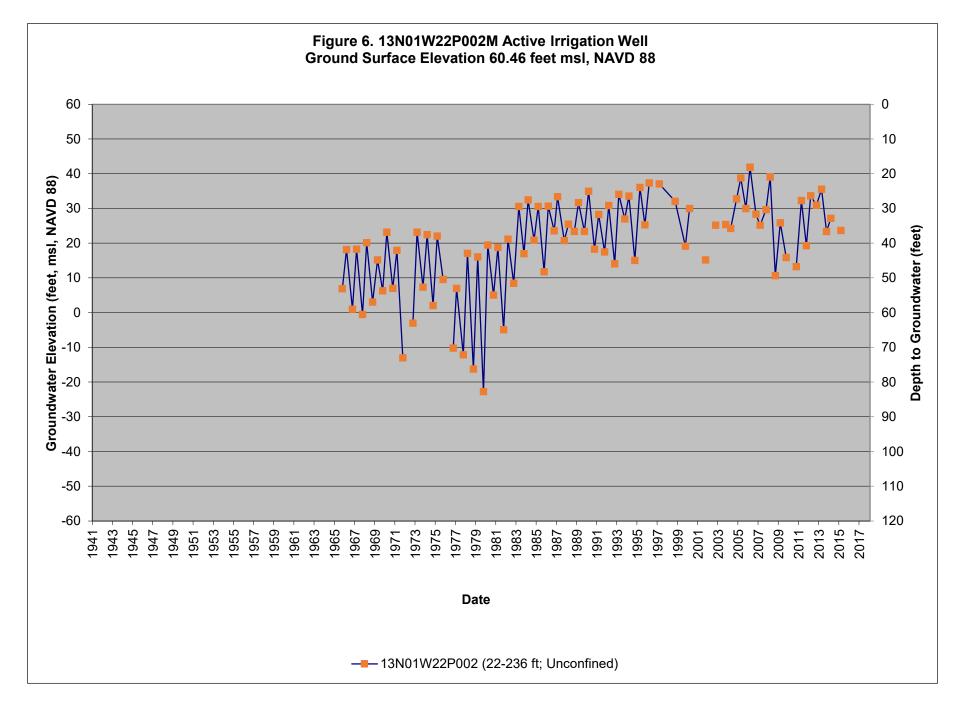
Colusa GSA and Glenn GSA Colusa Subbasin Groundwater Sustainability Plan

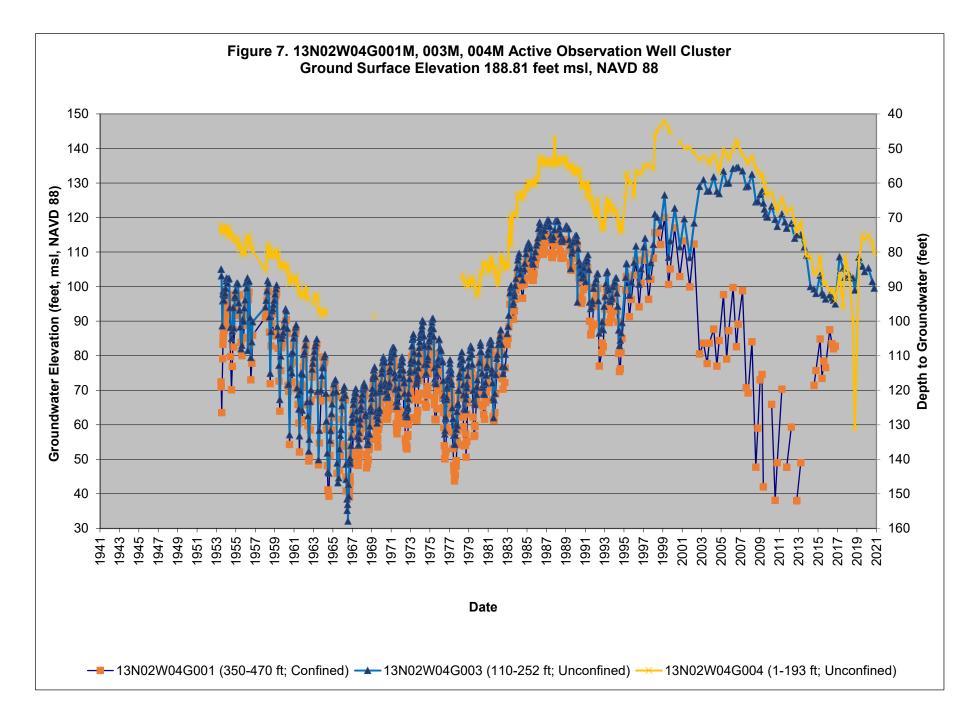


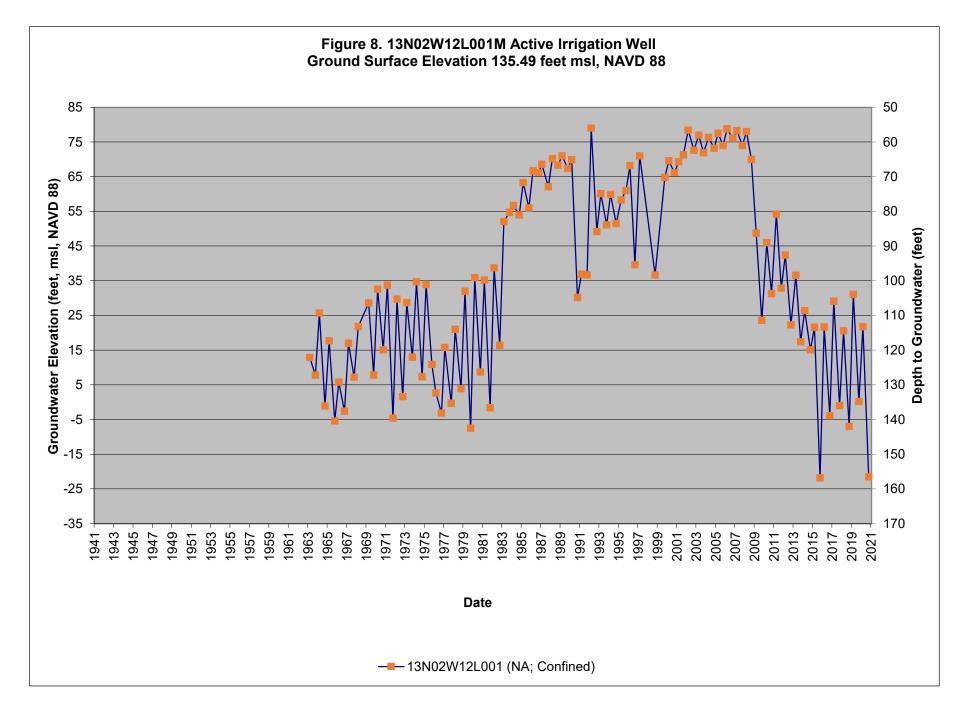


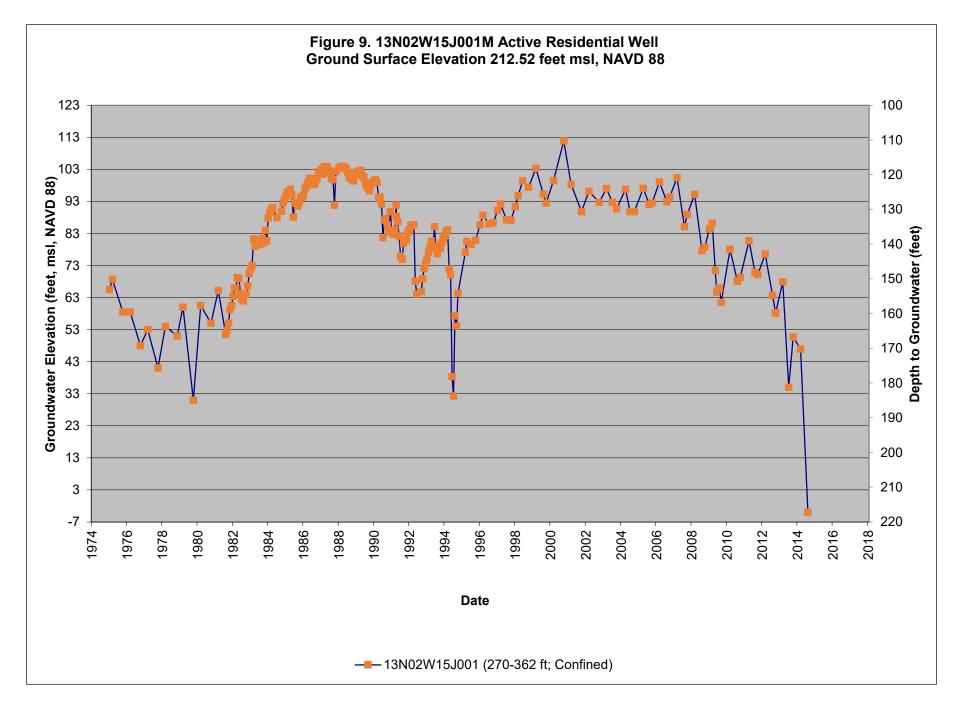


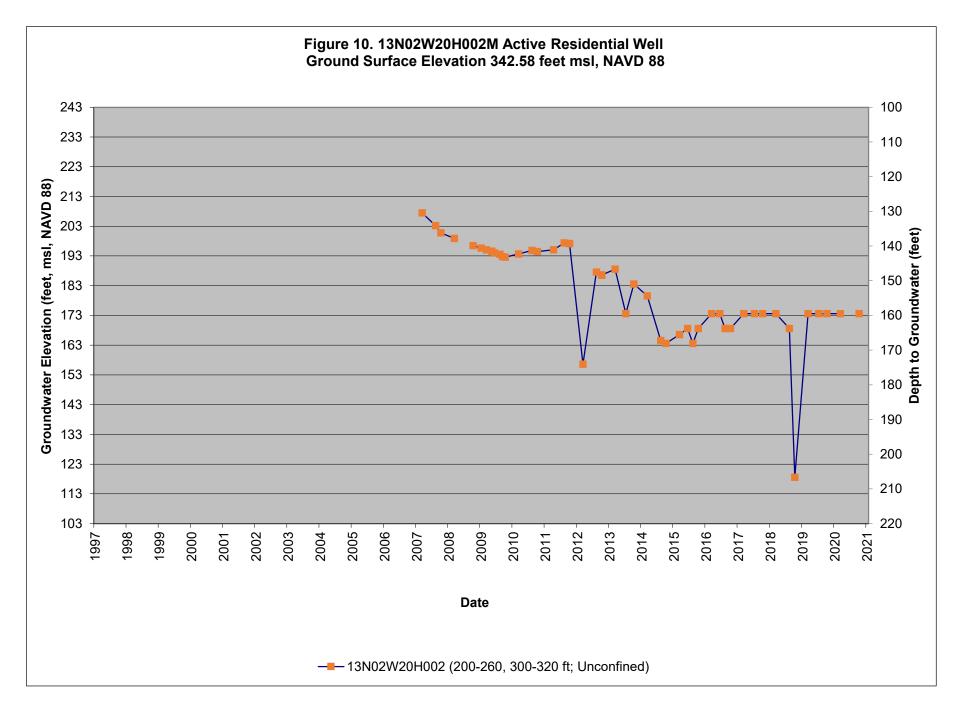


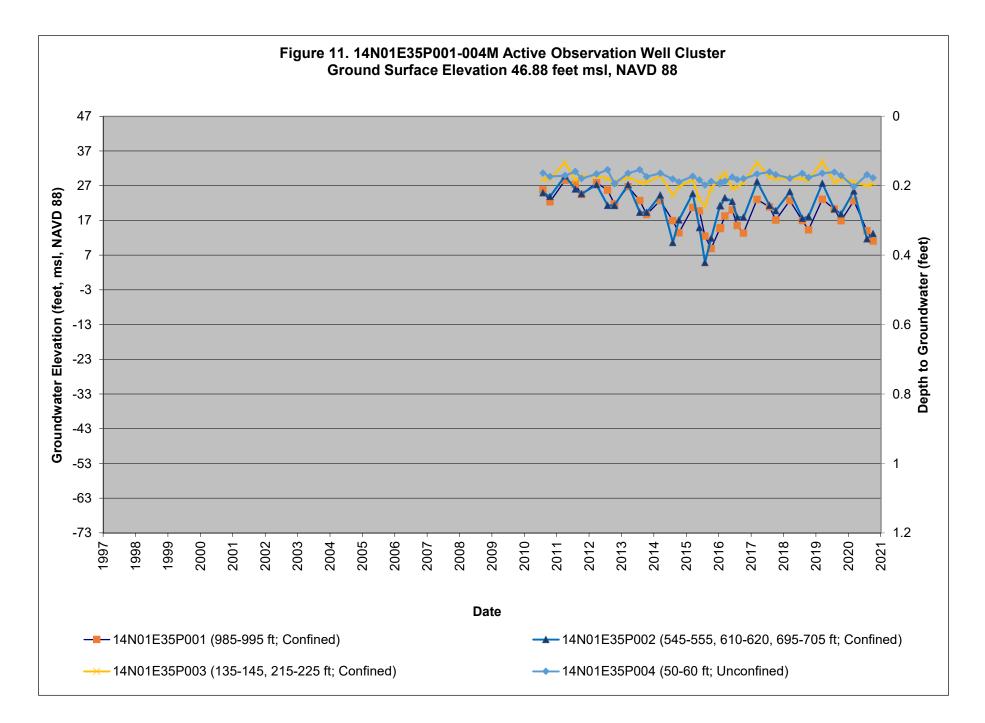


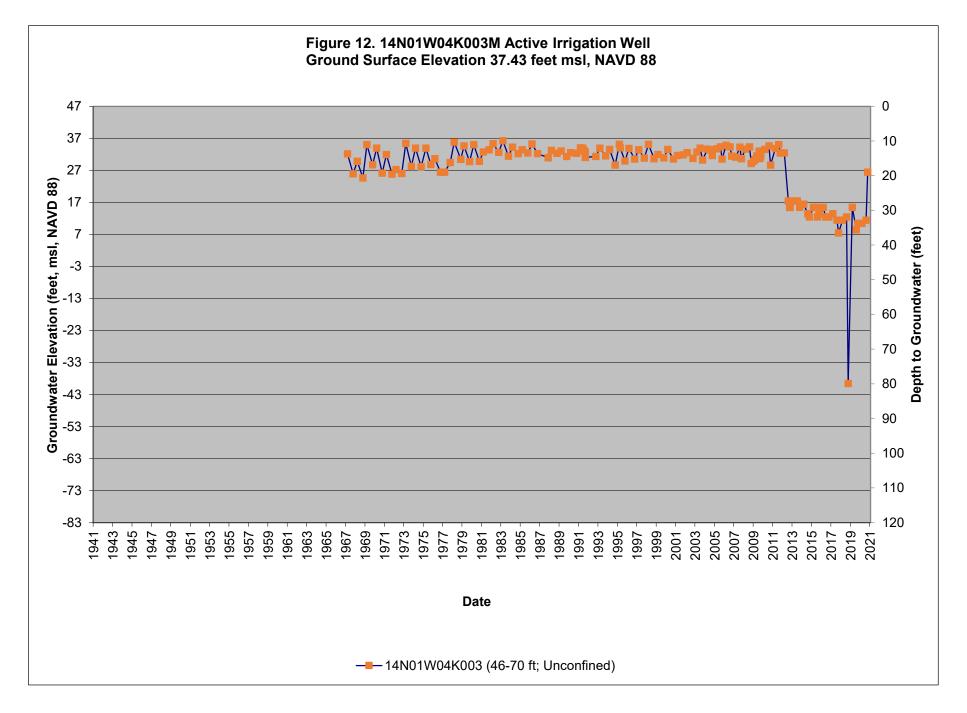


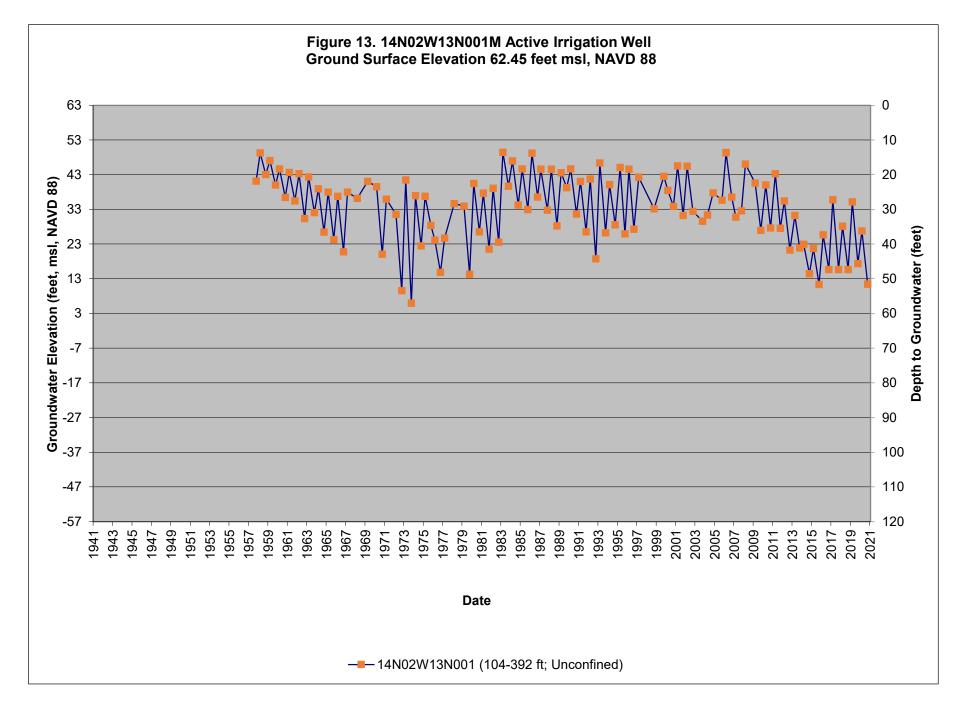


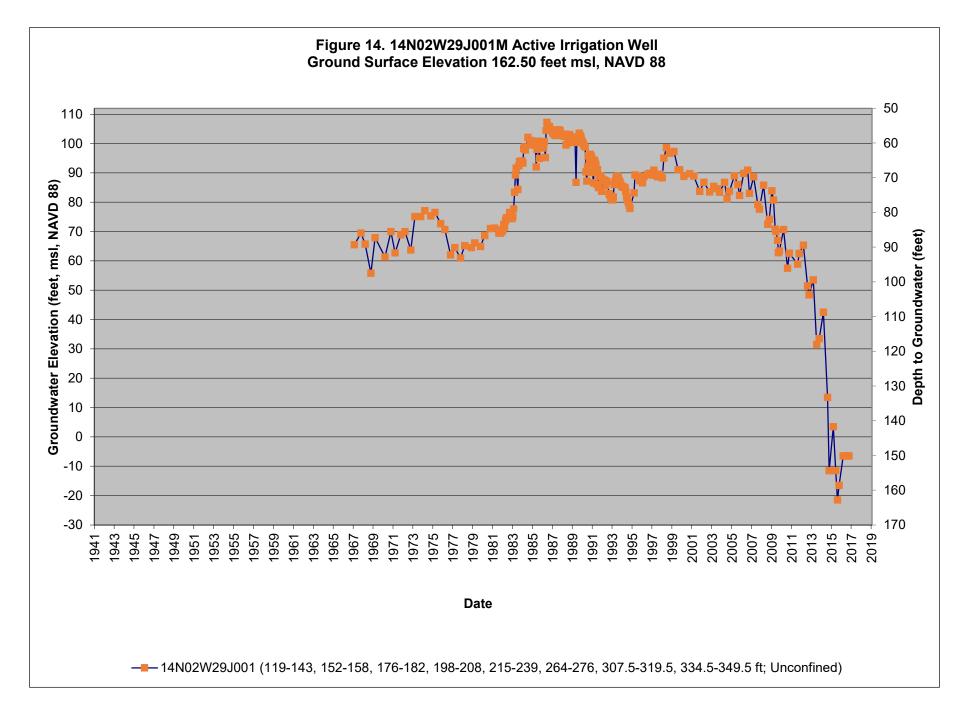


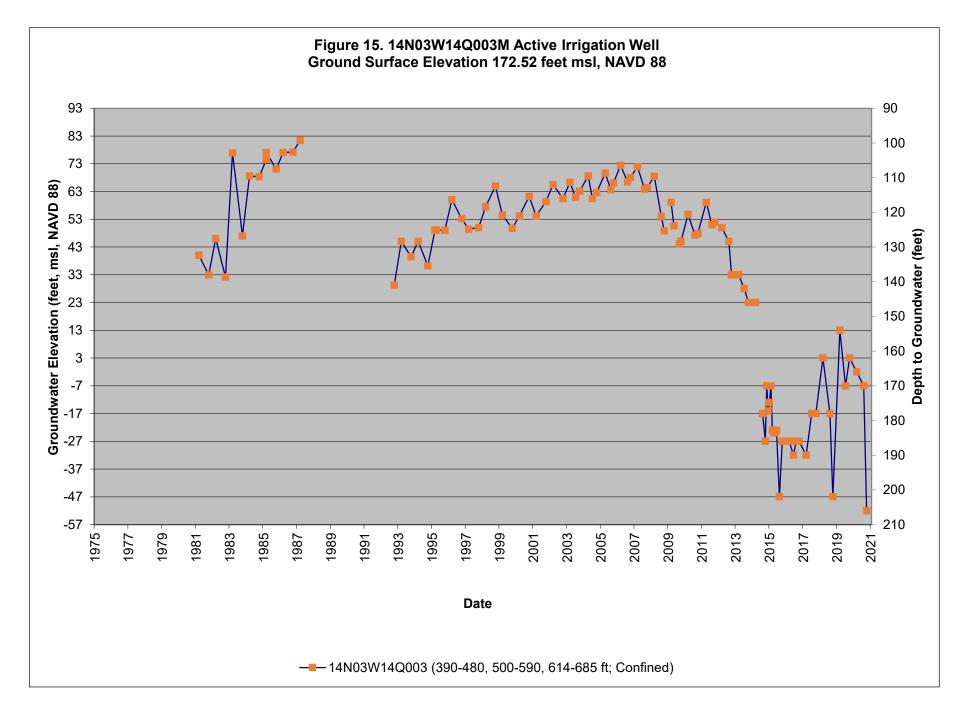


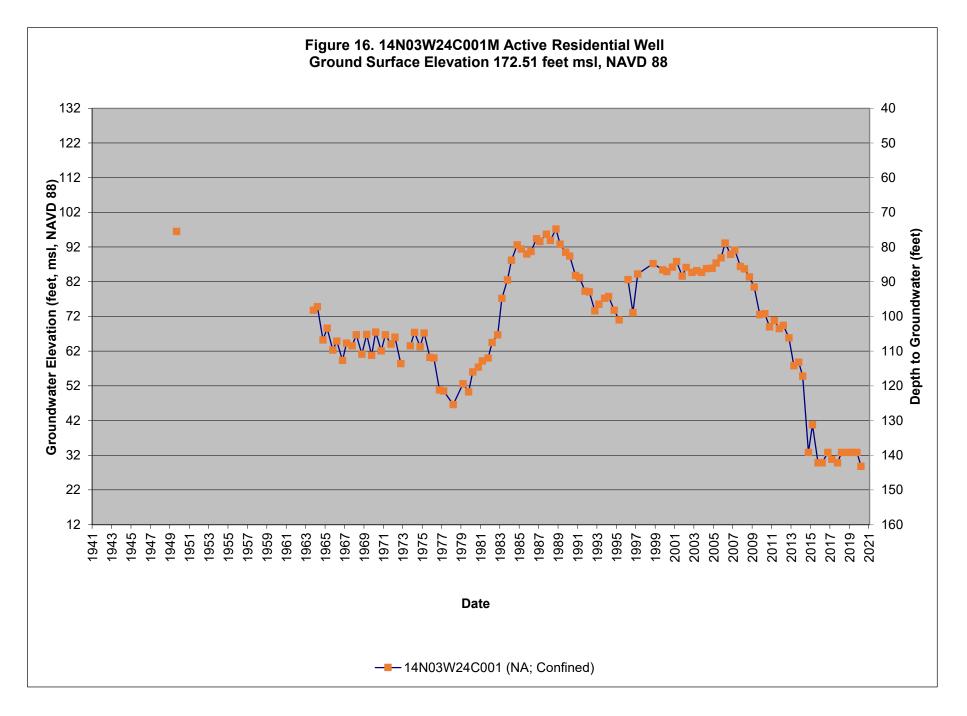


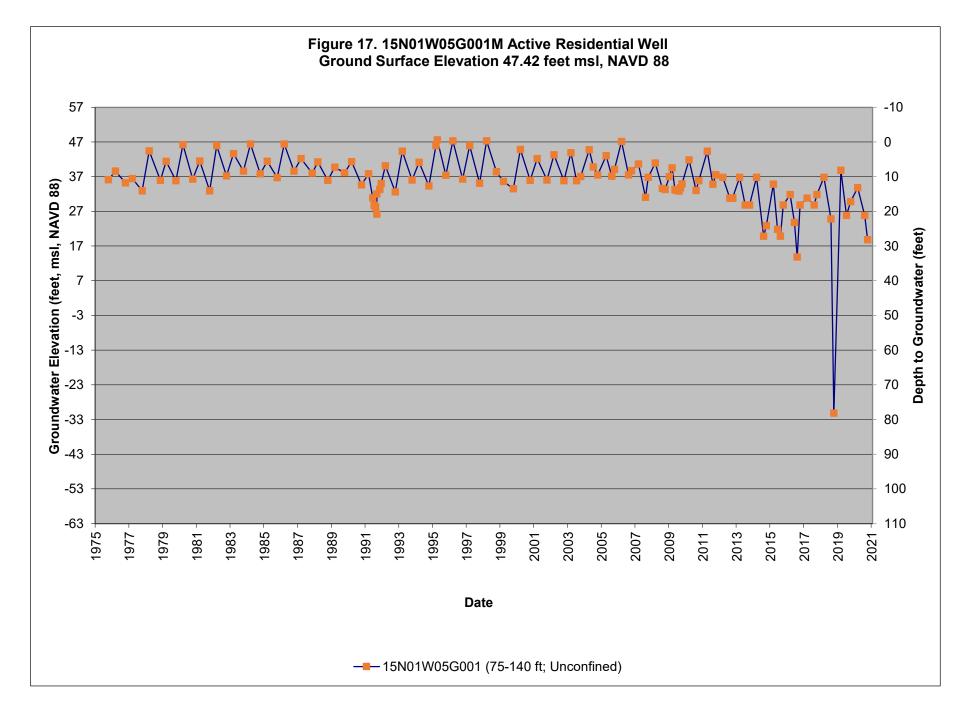


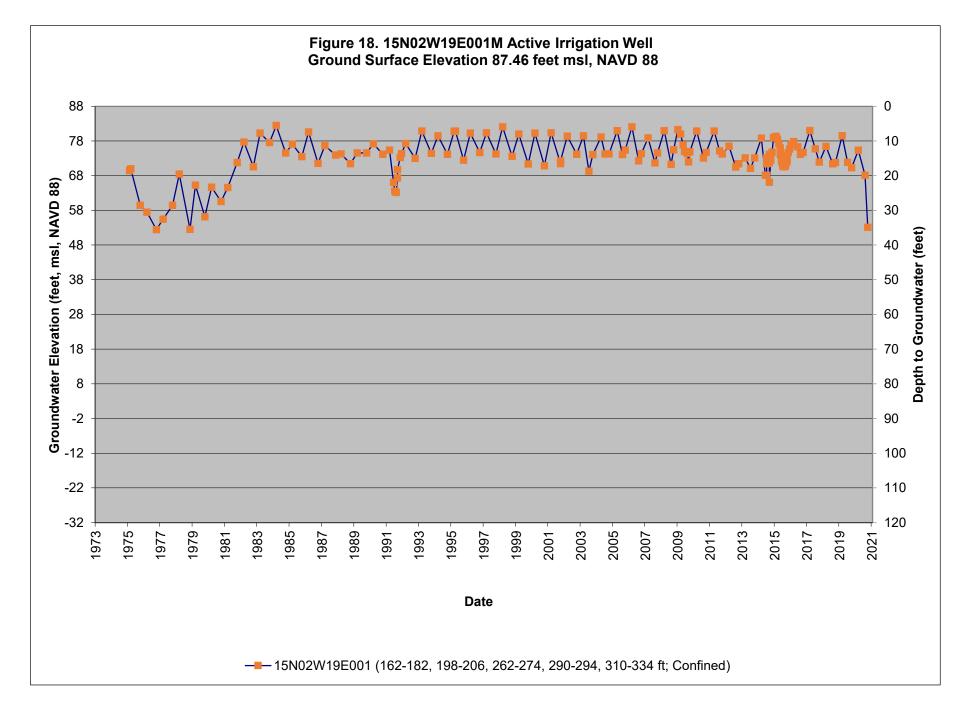


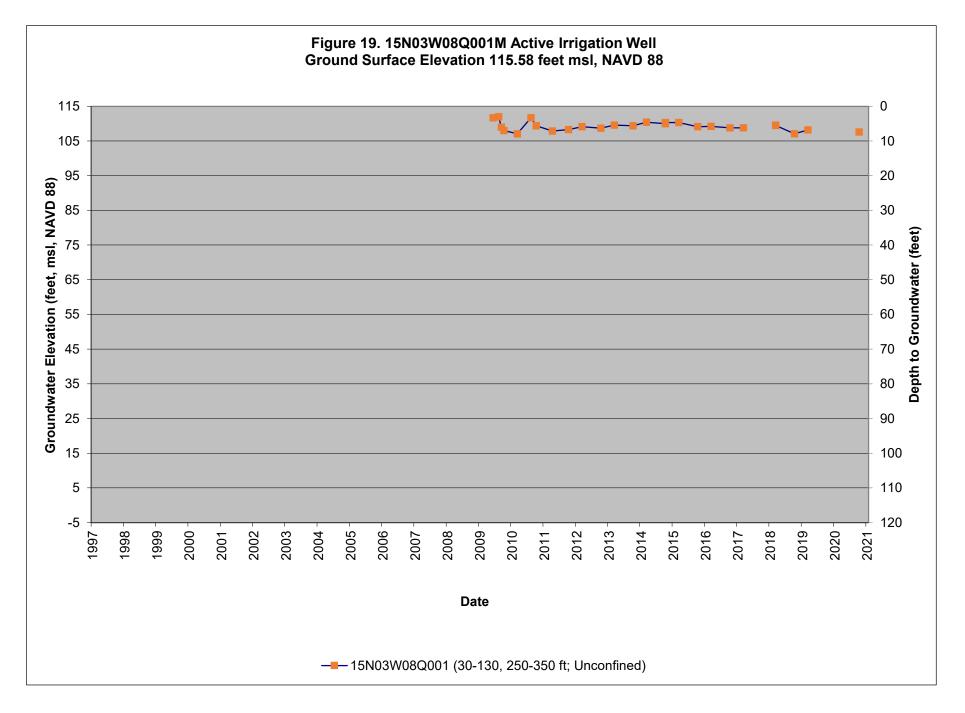


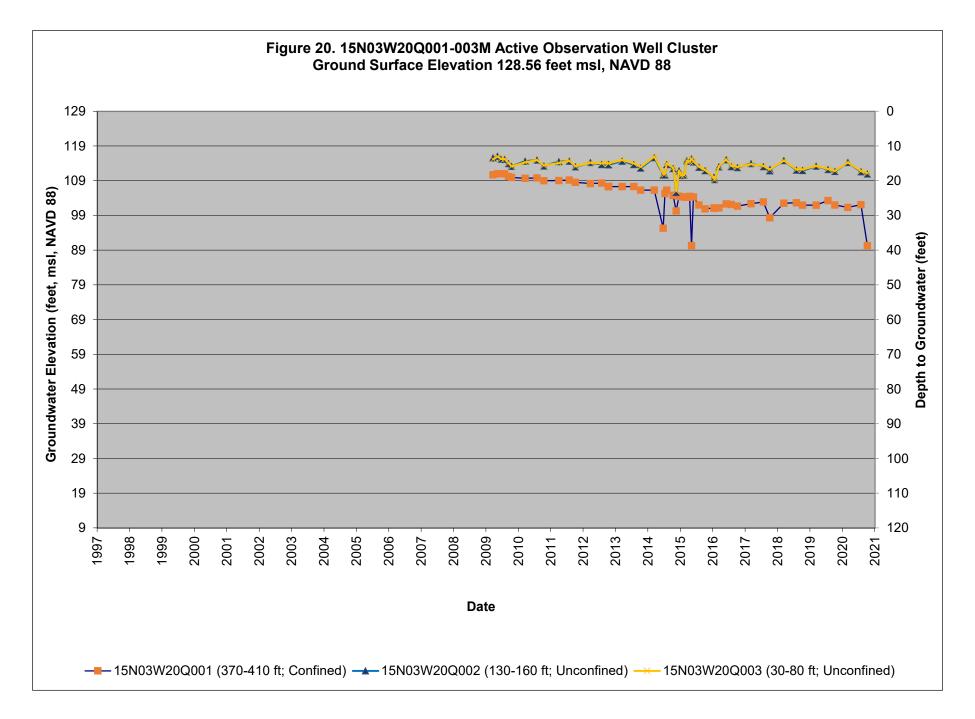


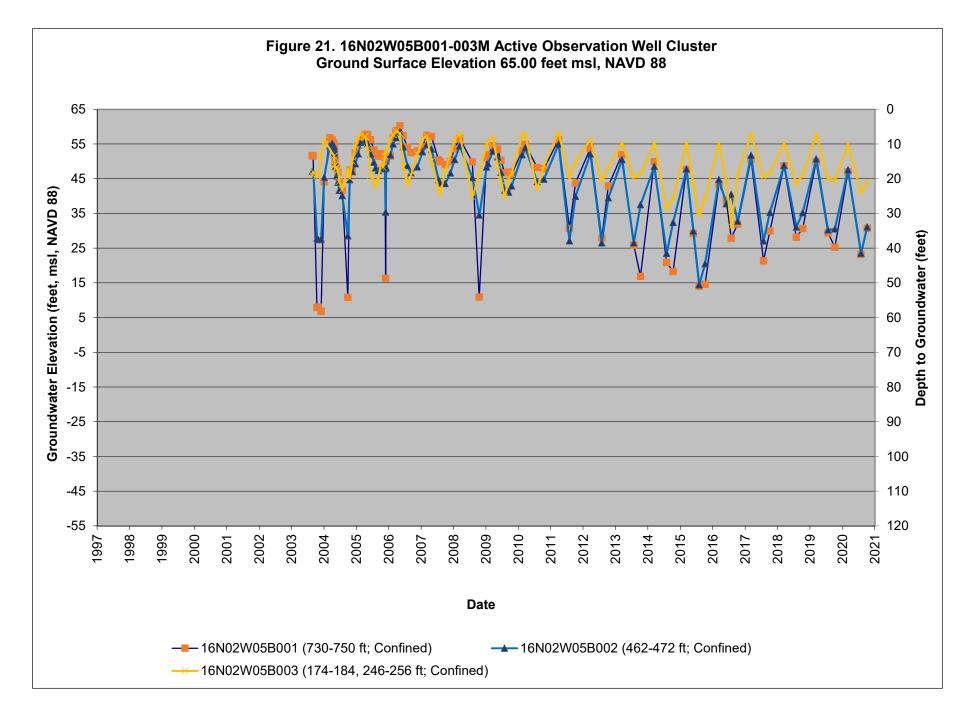


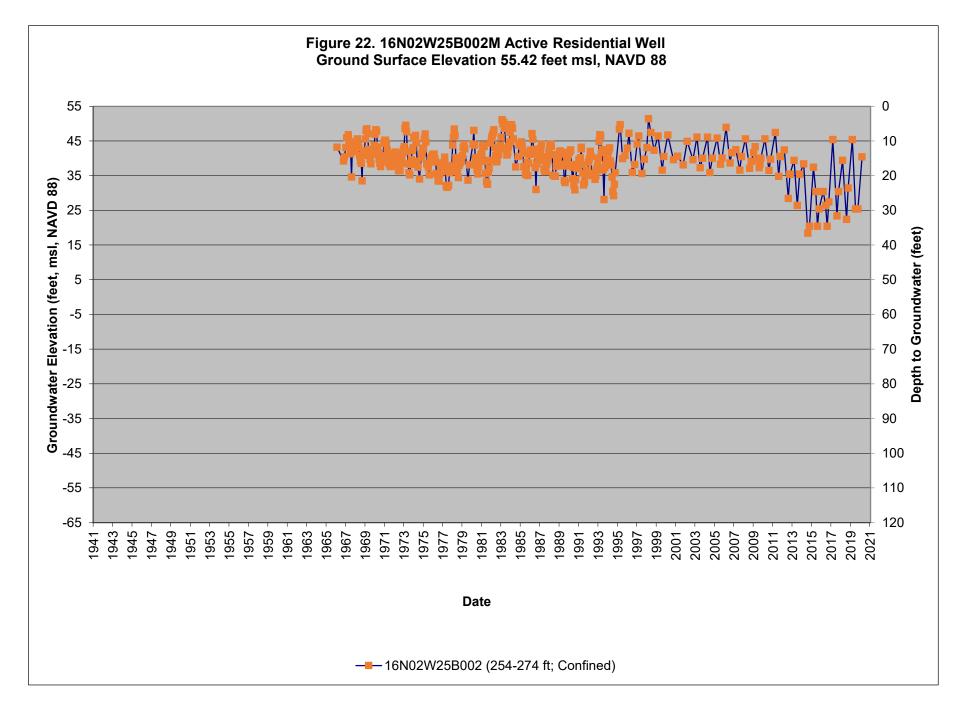


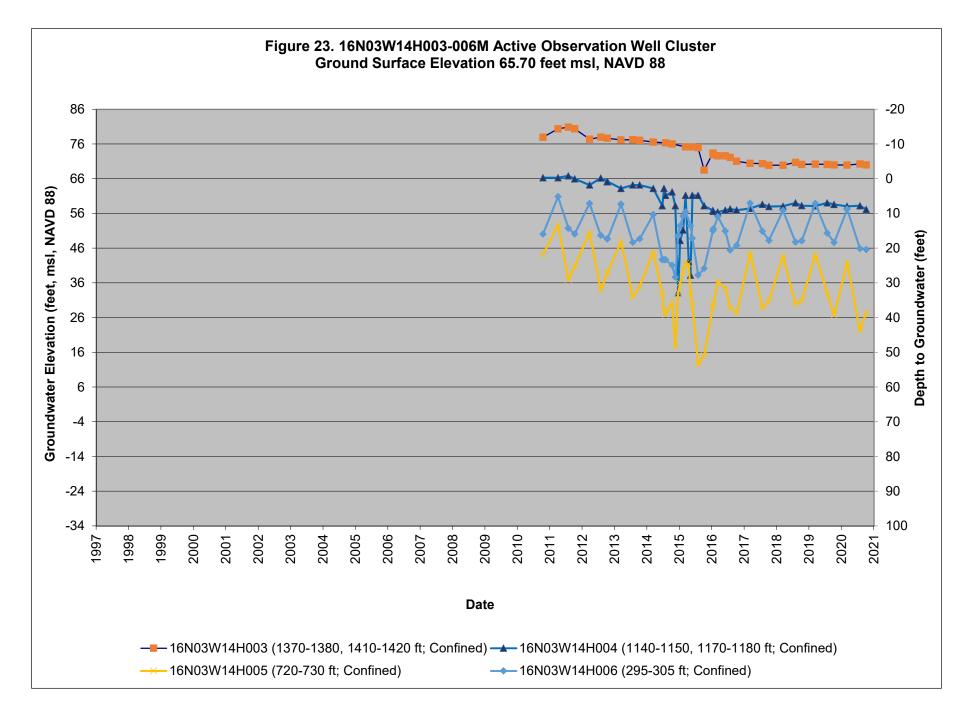


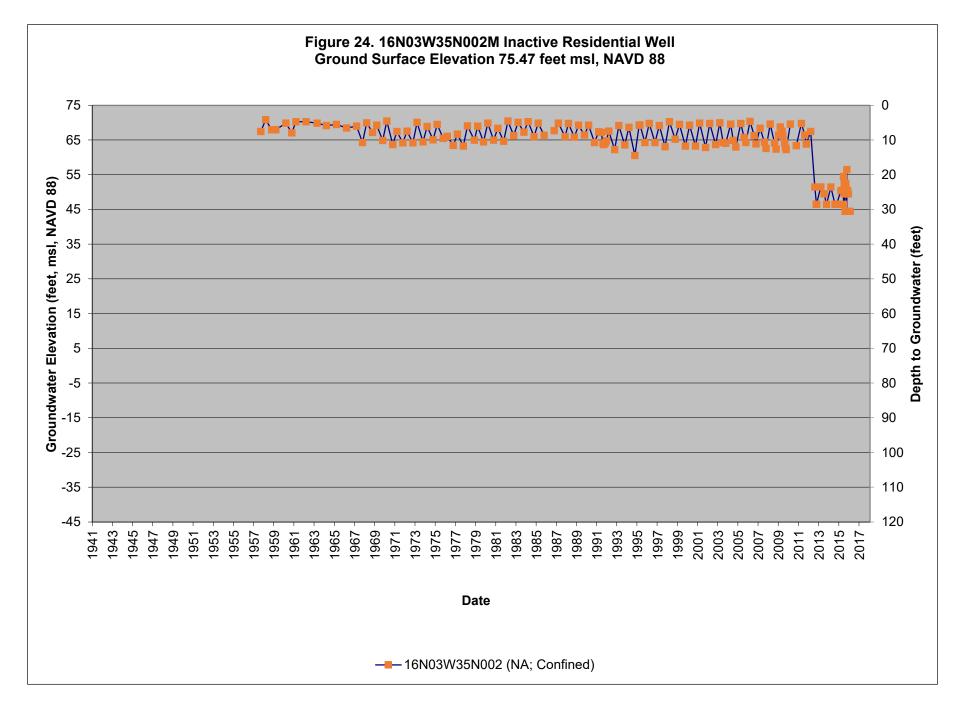


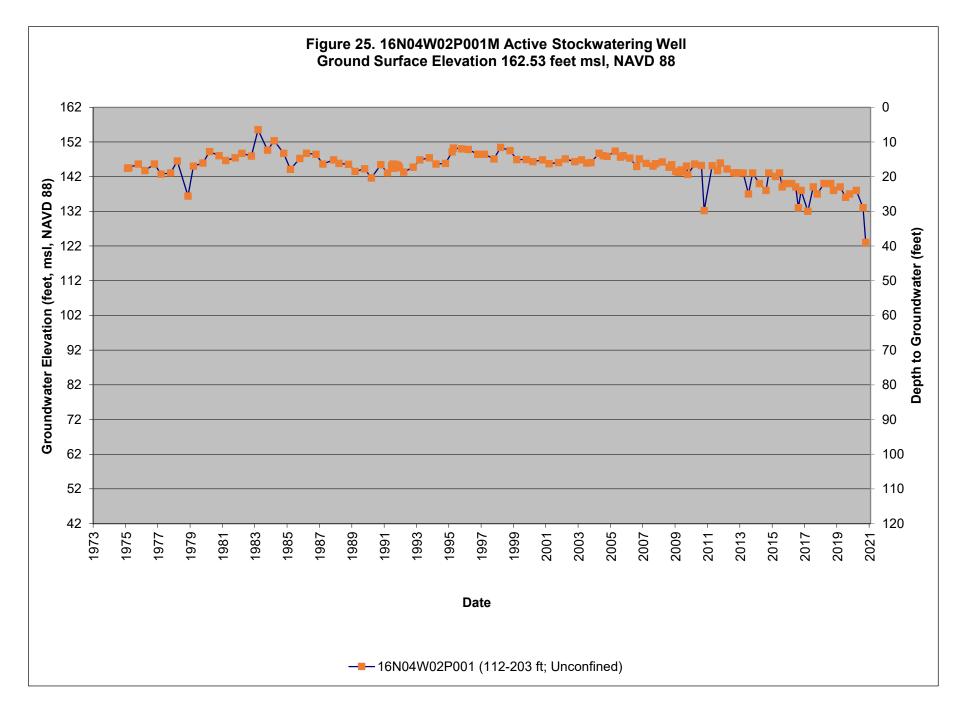


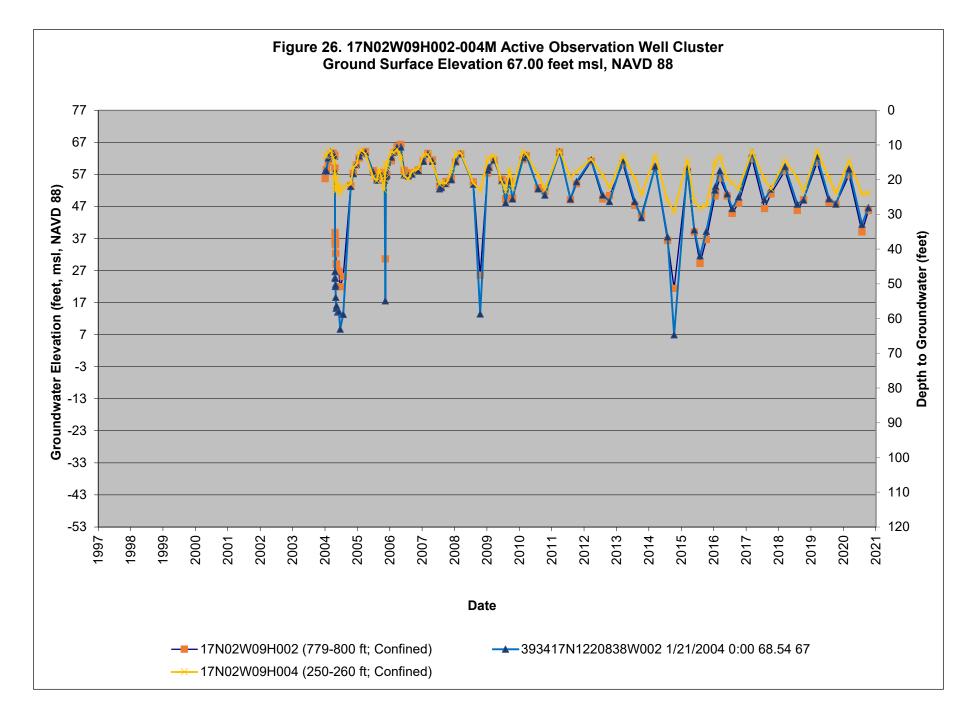


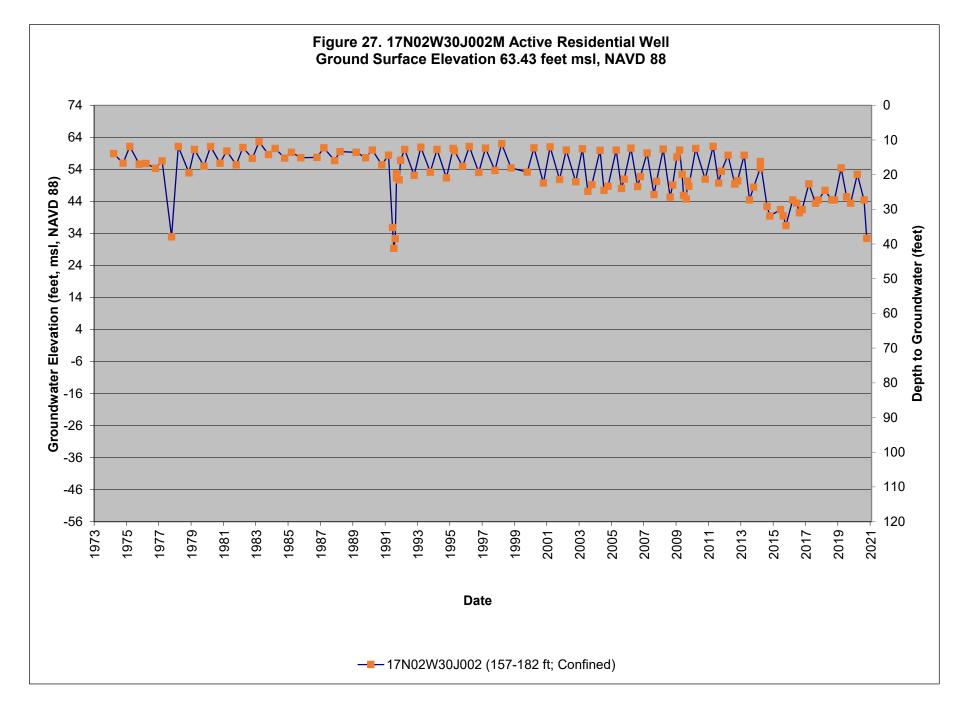


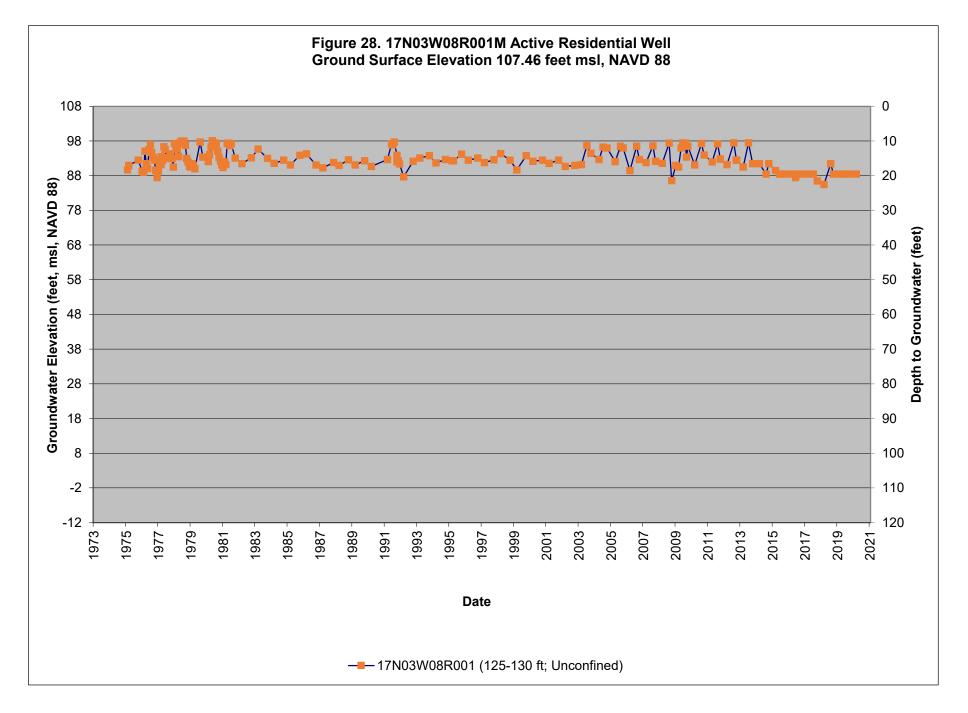


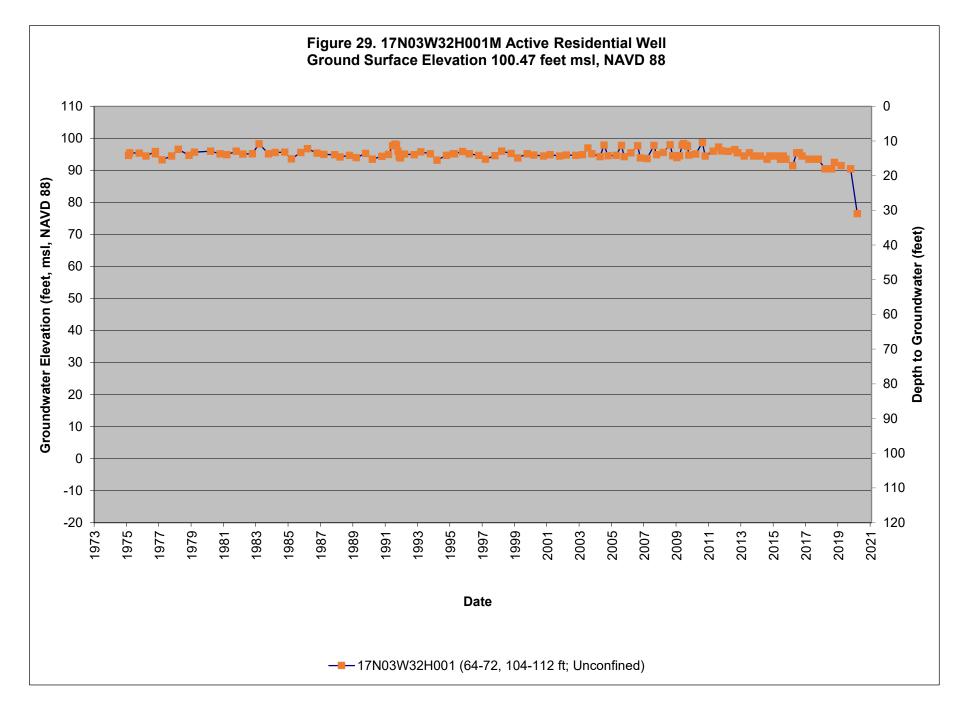


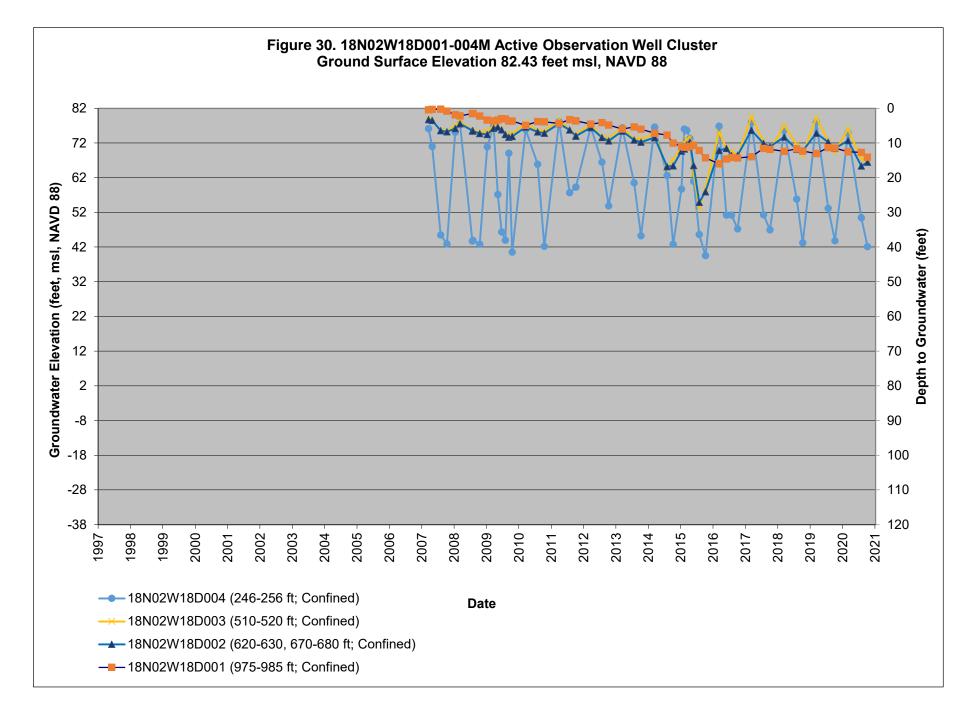


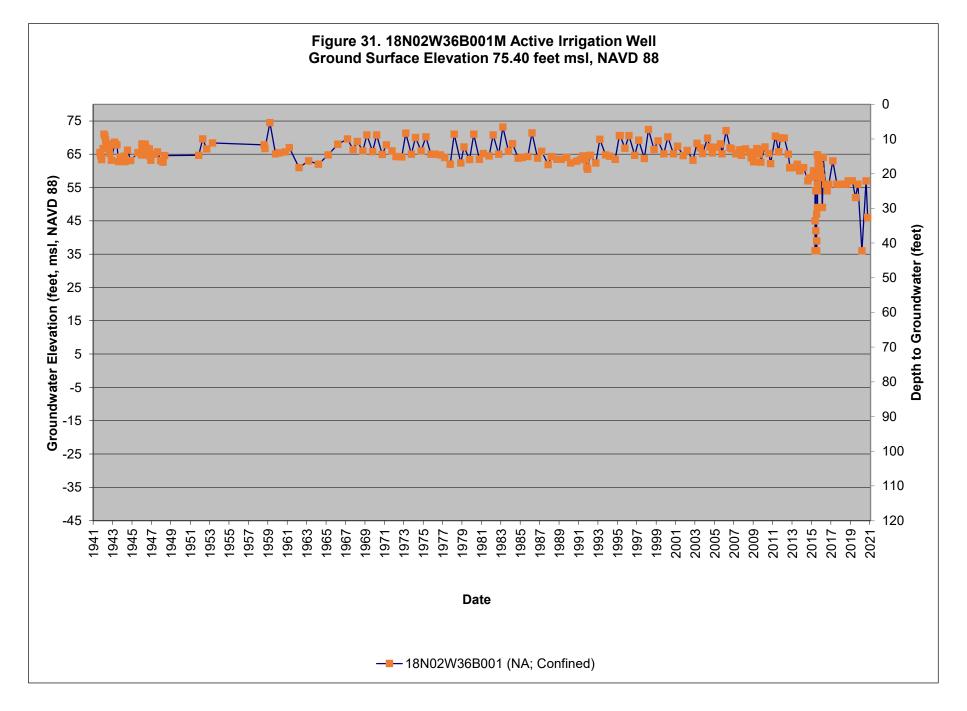


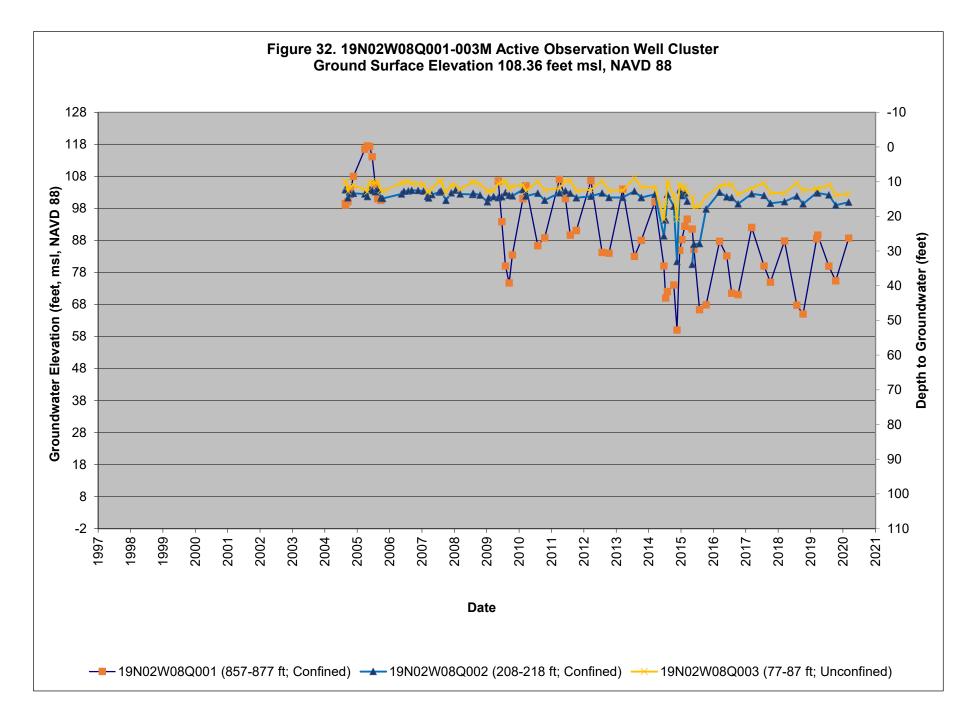


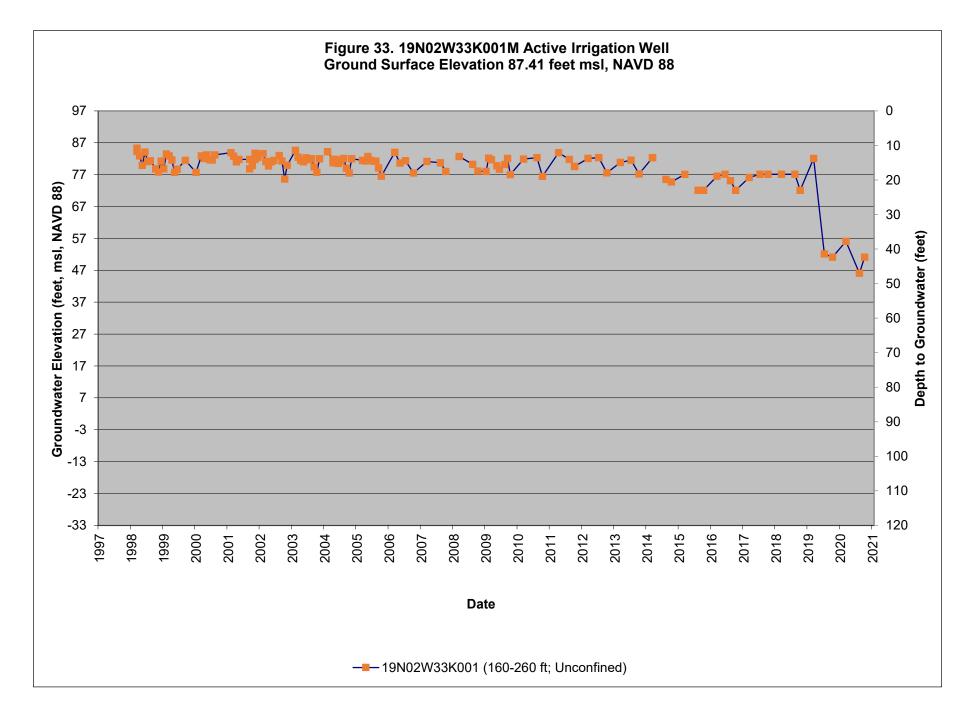


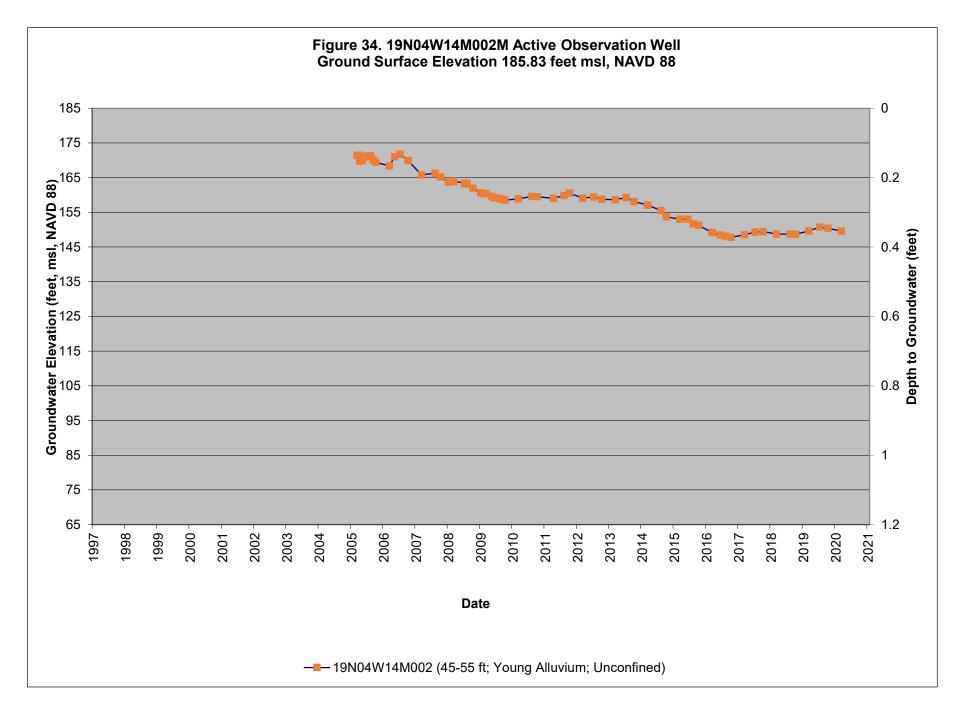


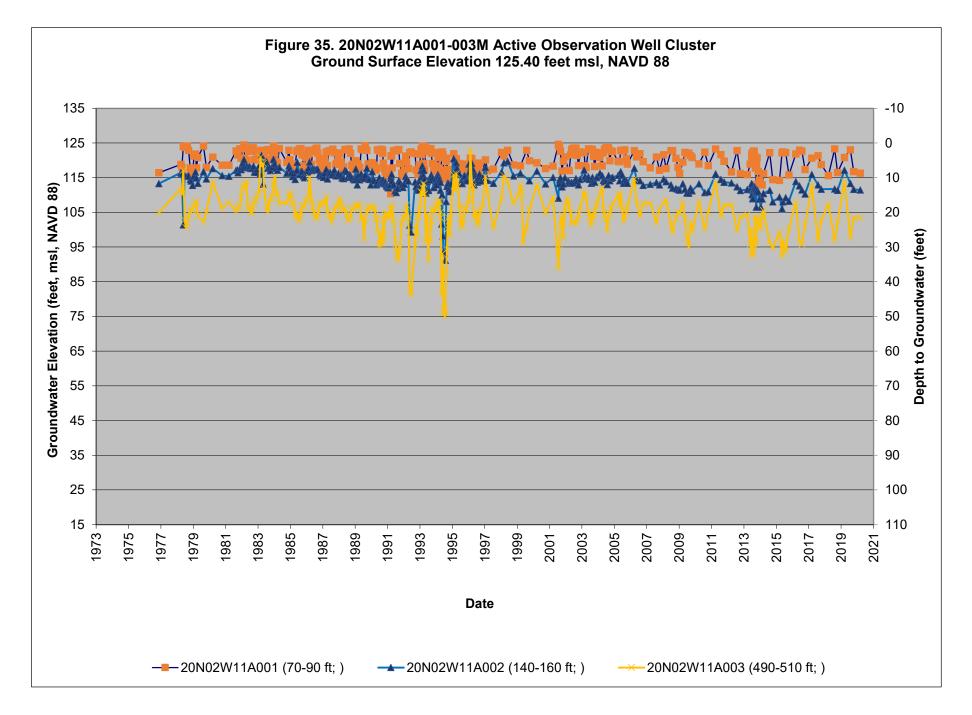


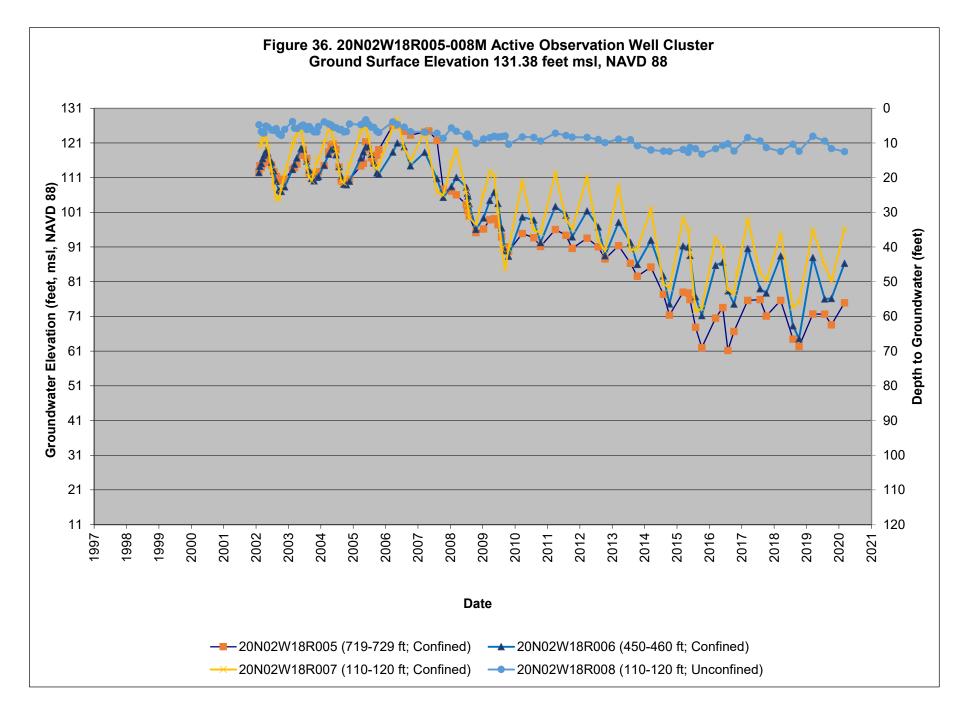


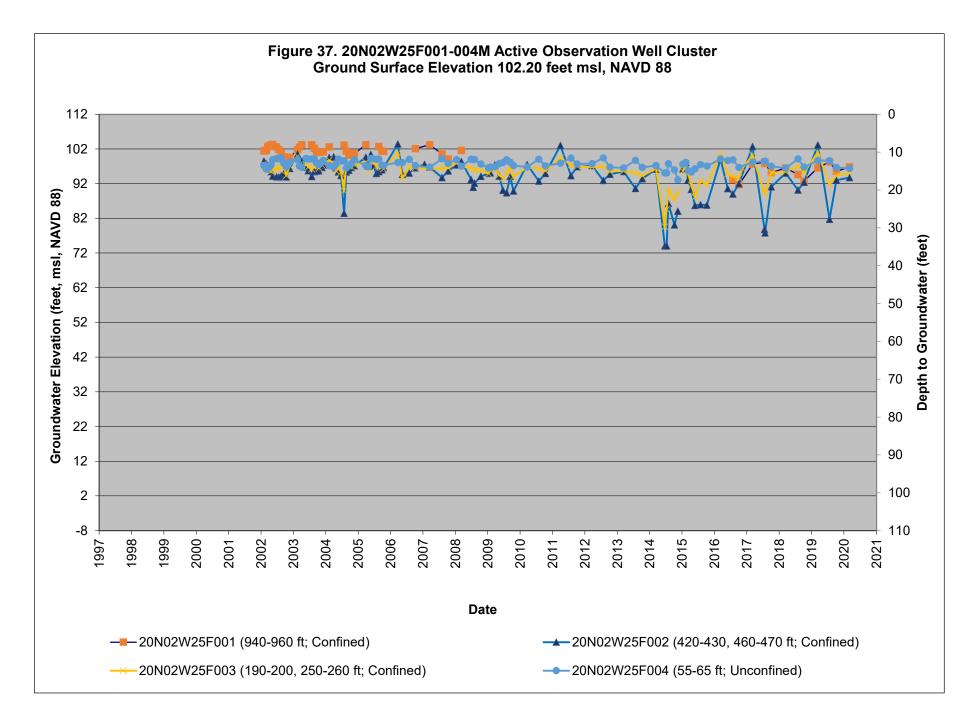


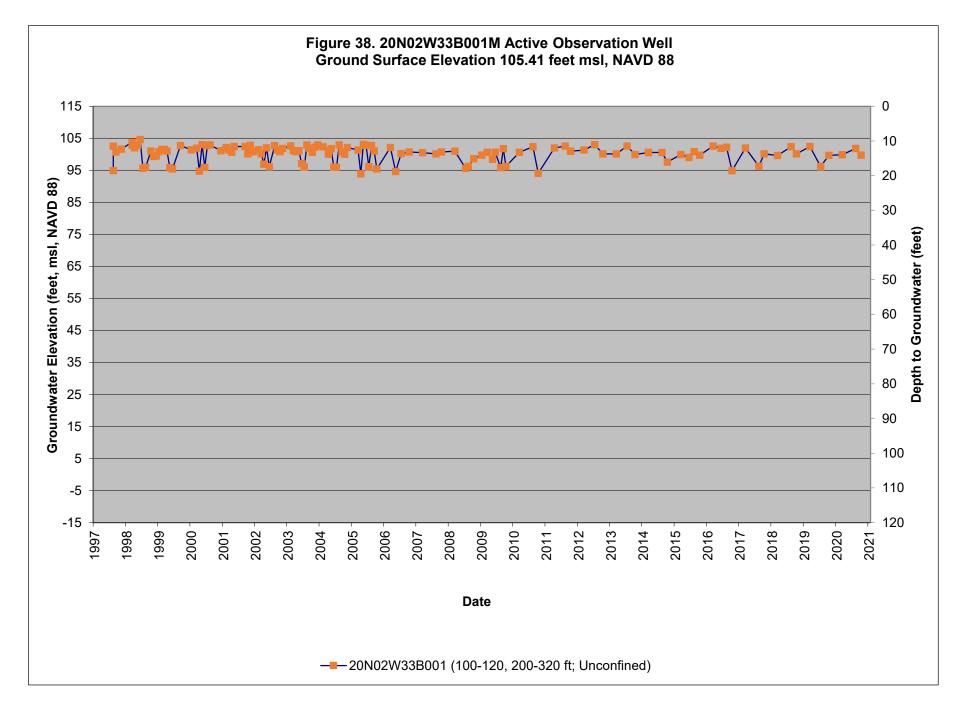


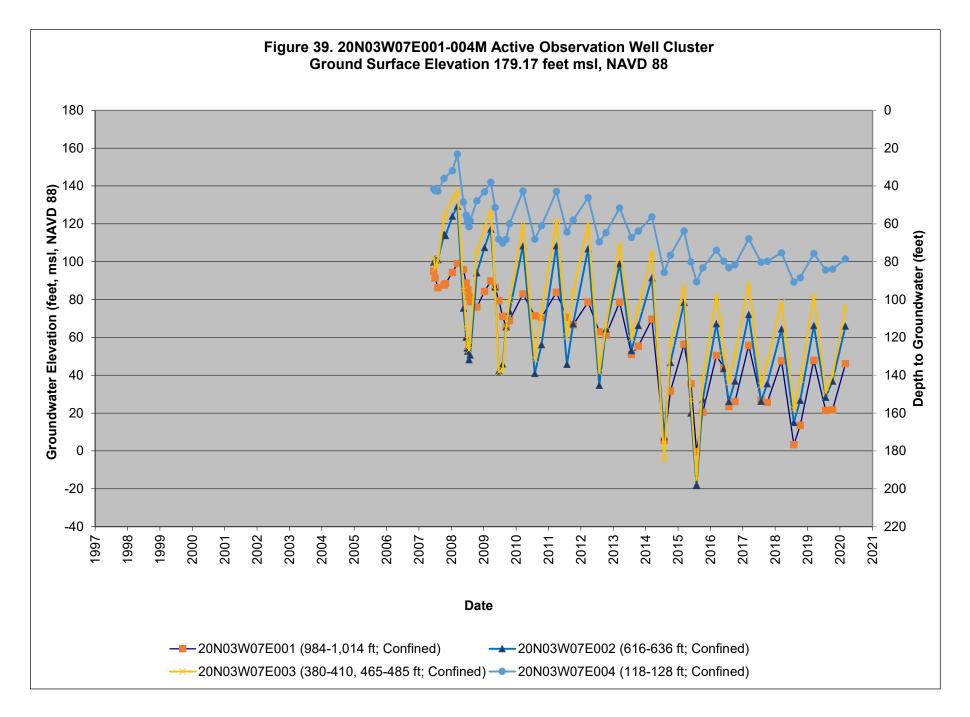


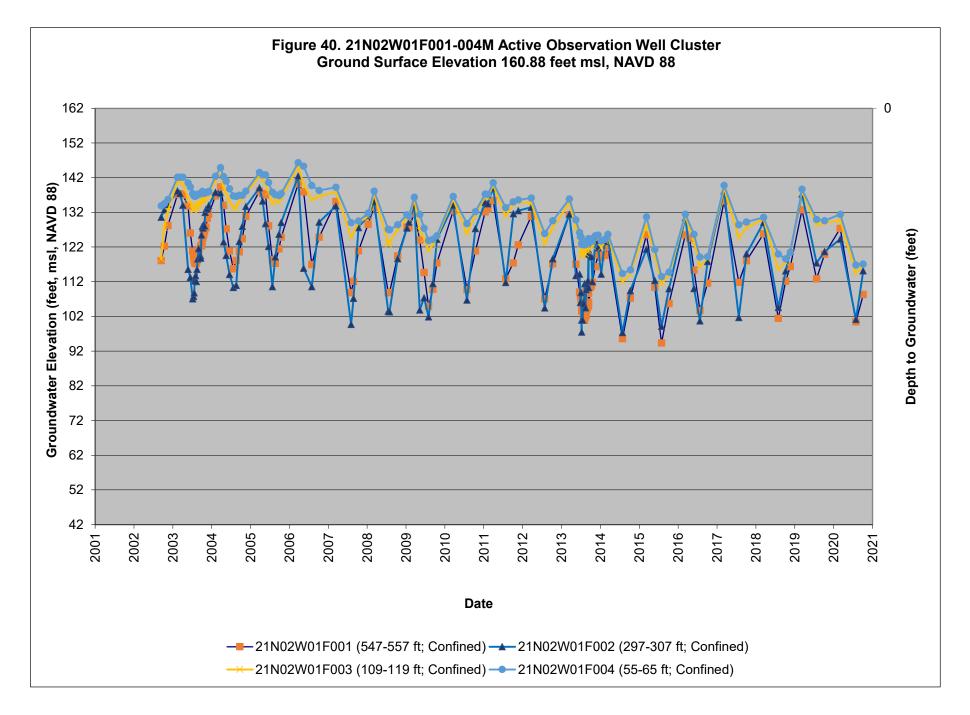


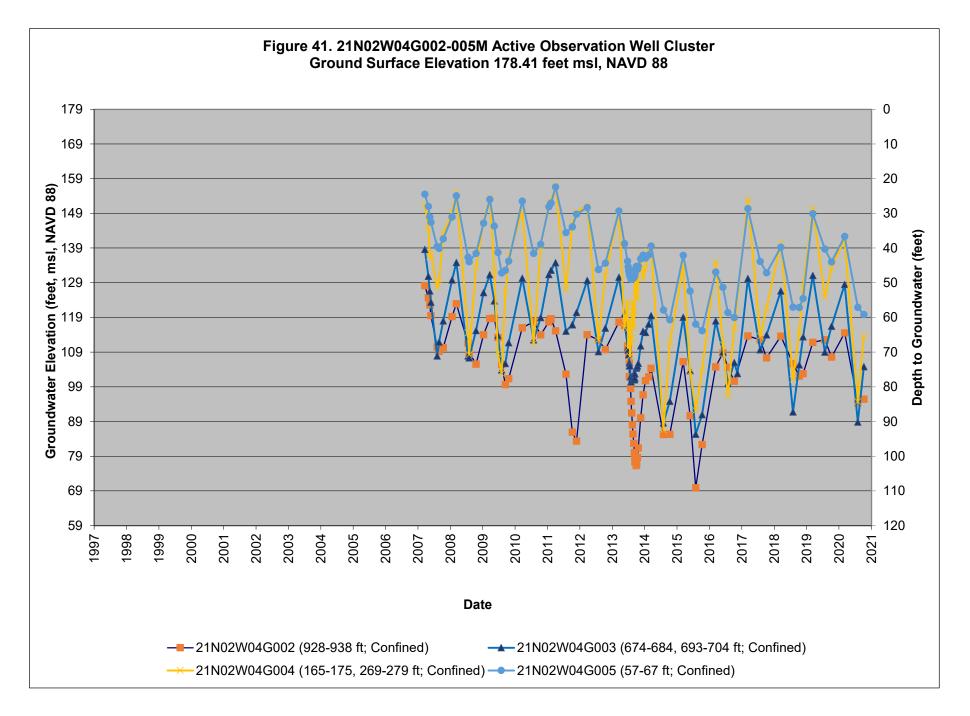


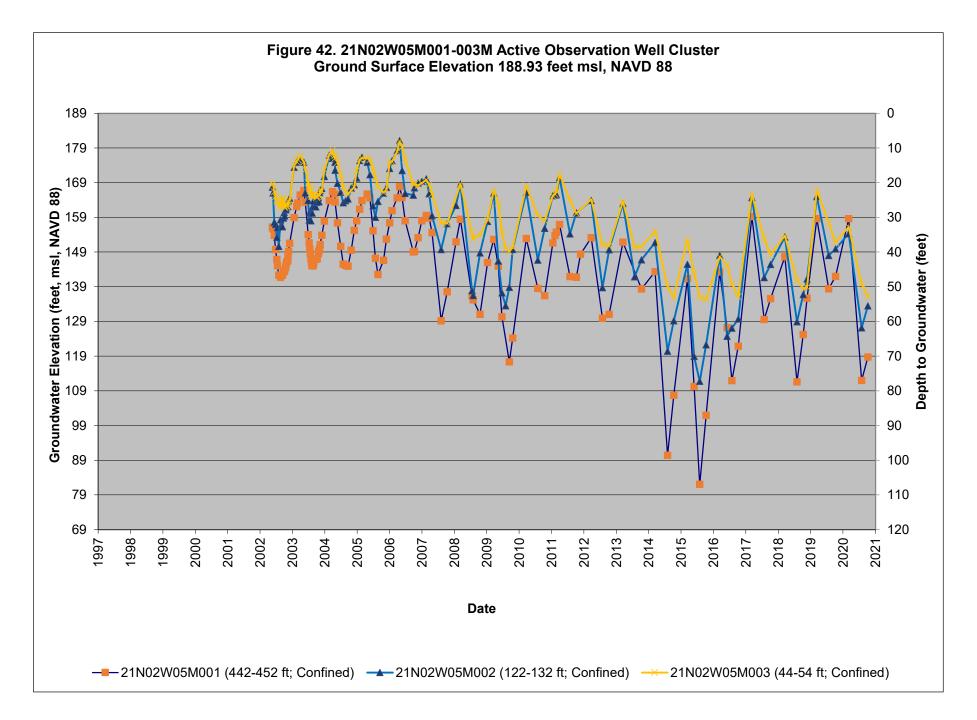


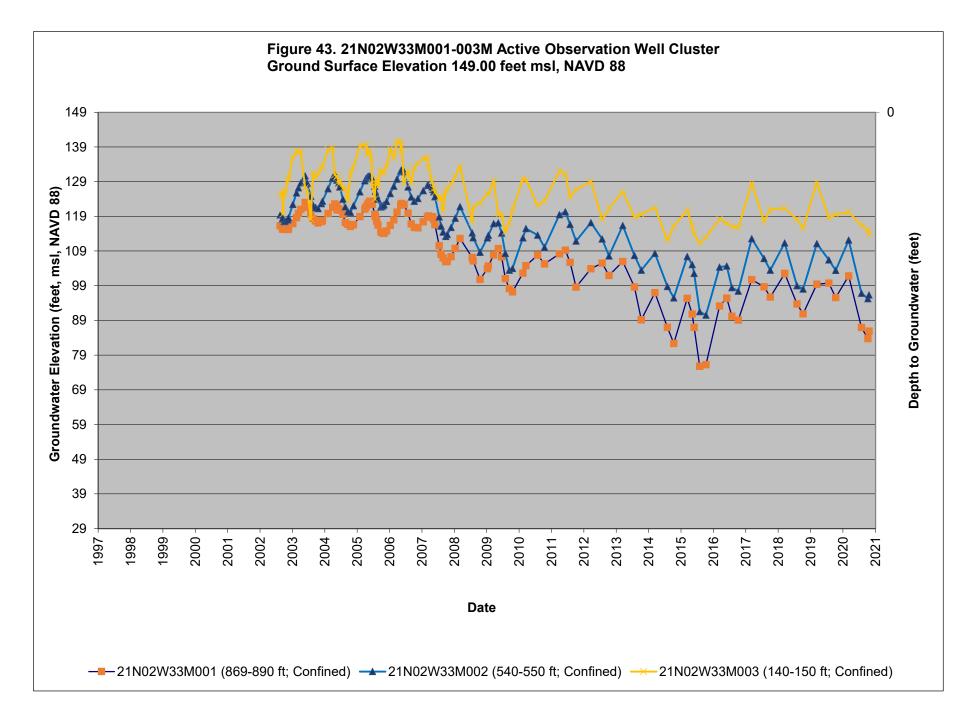


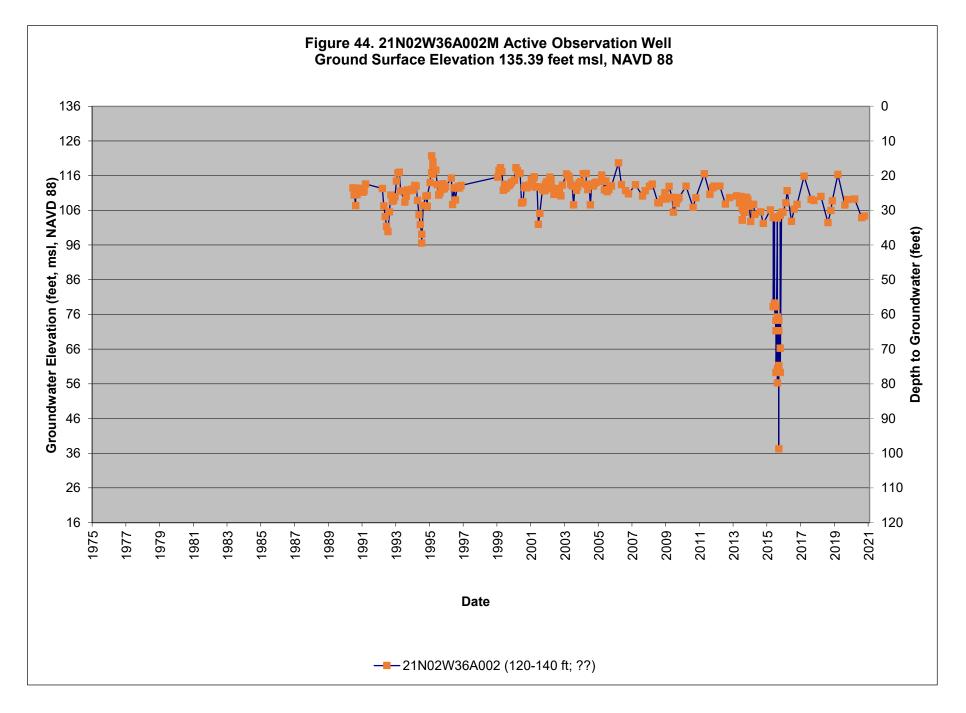


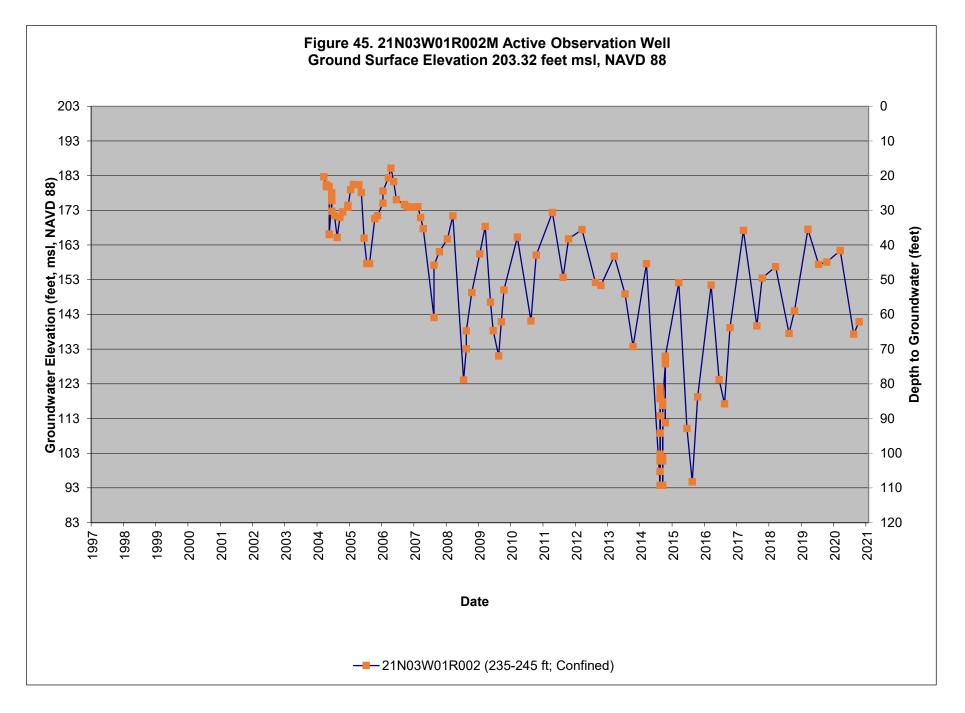


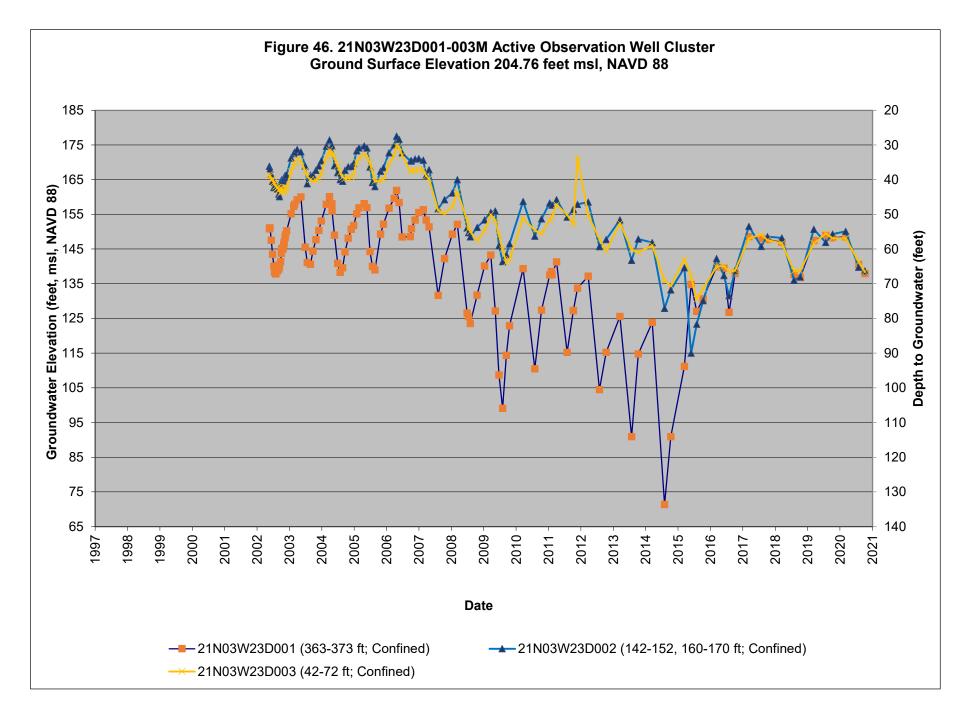


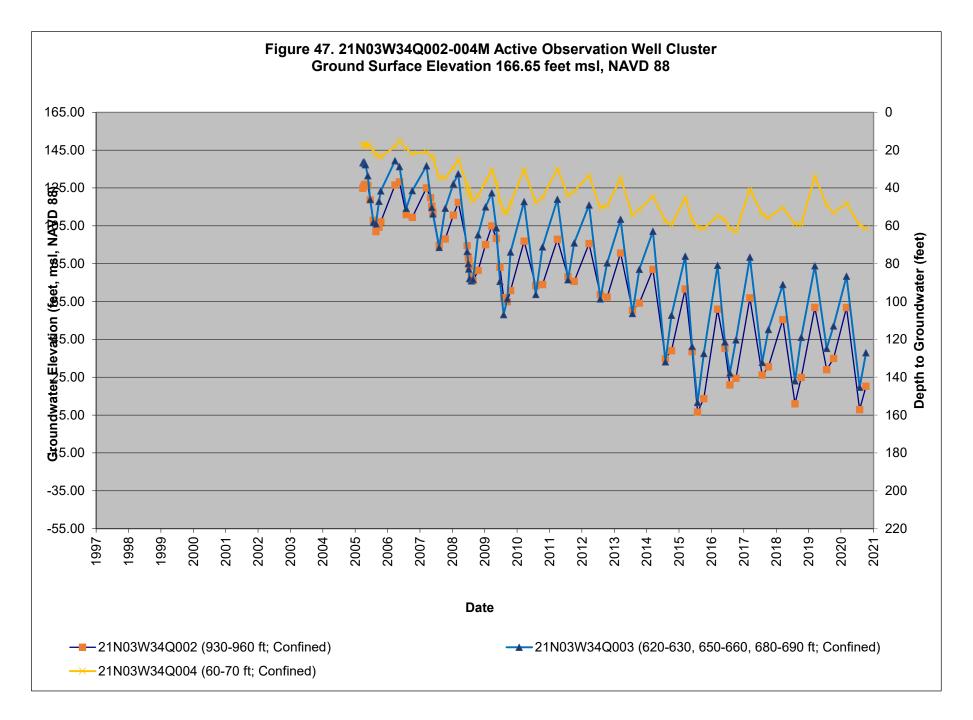


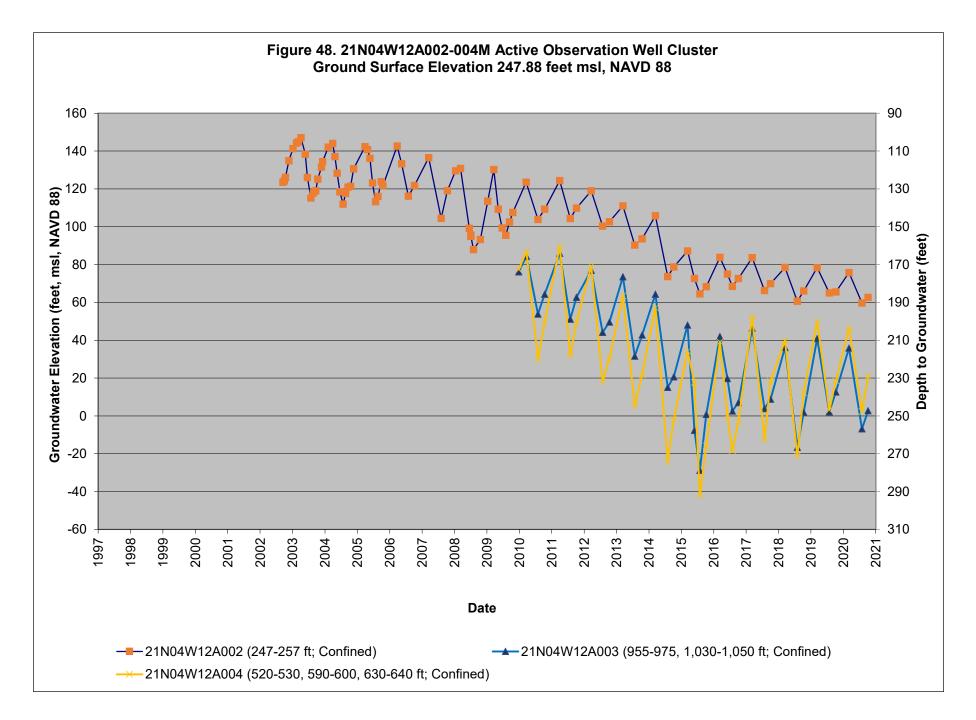


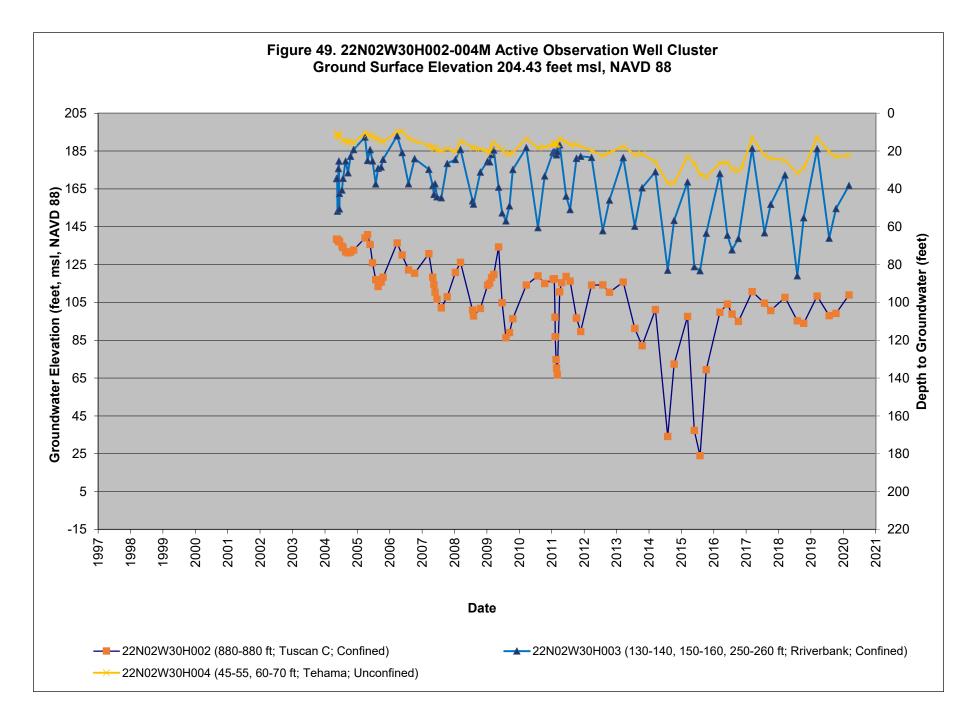


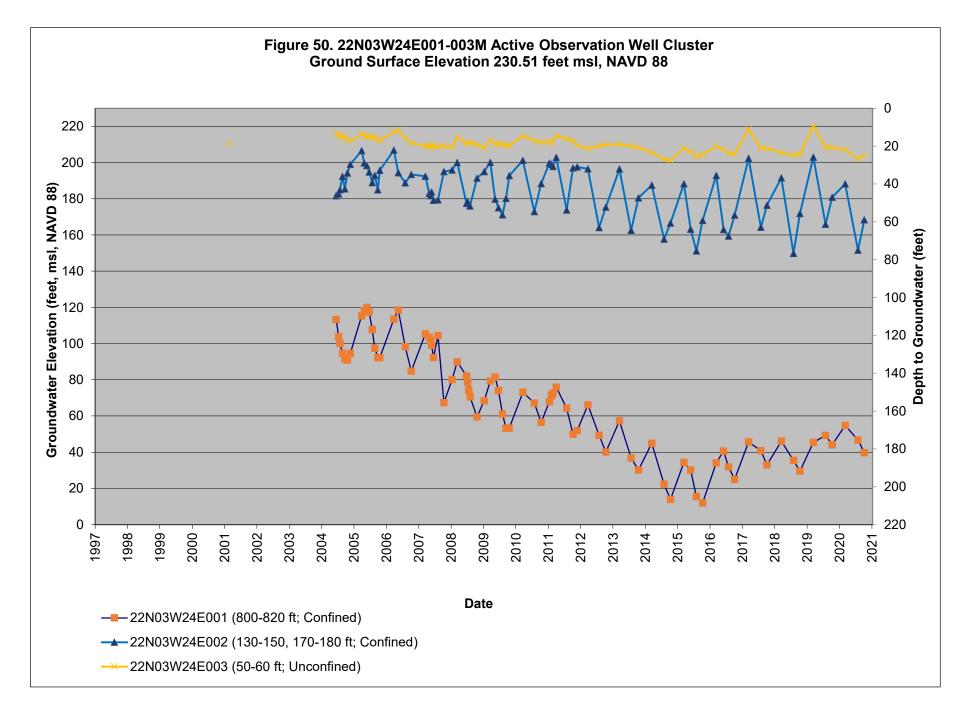


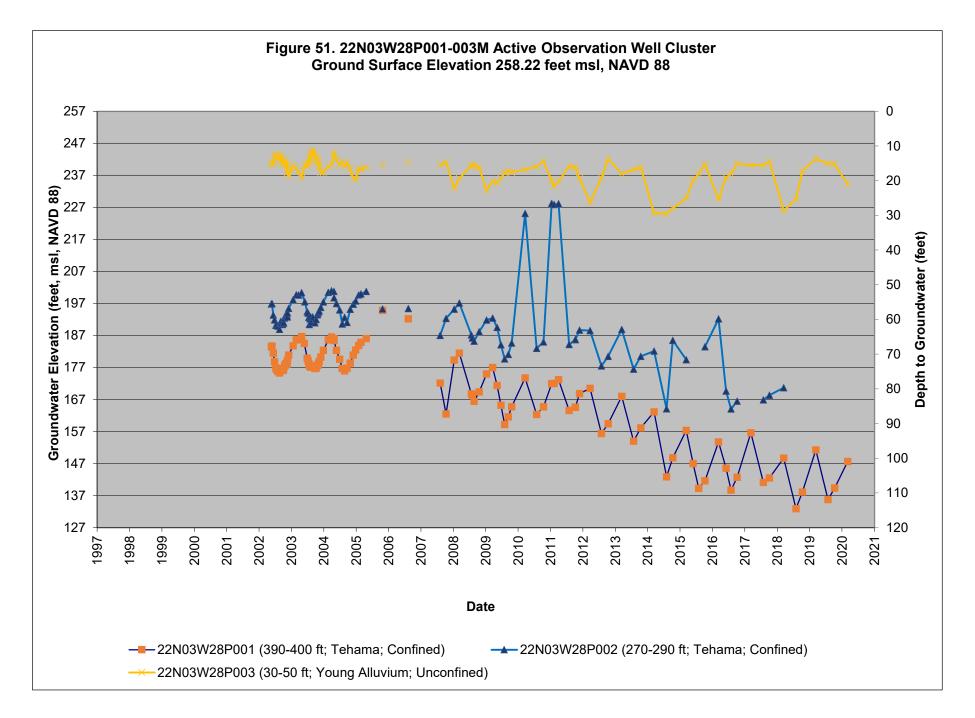






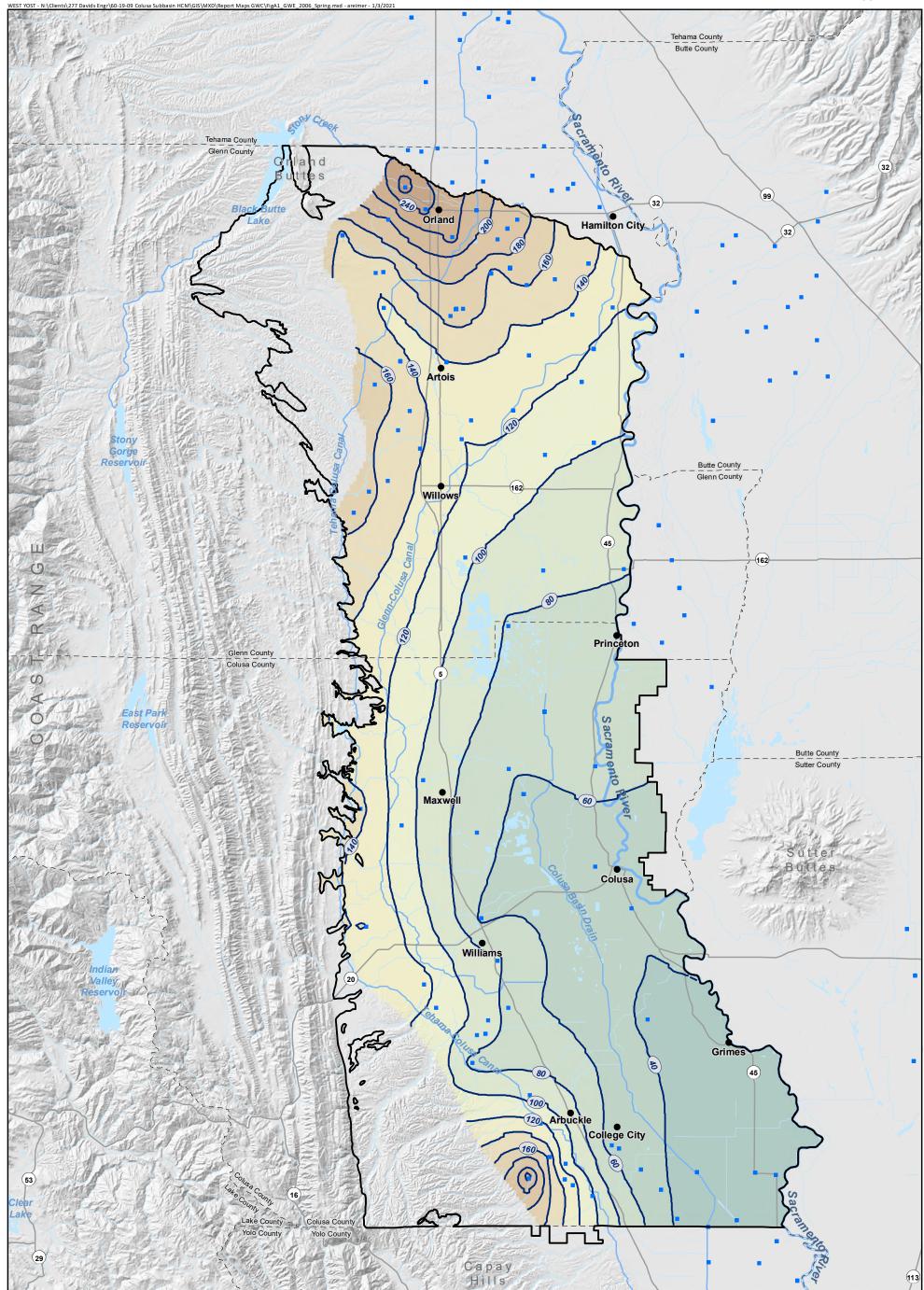


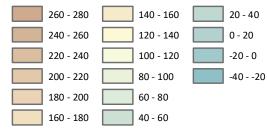




Appendix 3B

Historical Groundwater Elevation Contour Maps





- Well Used for Contouring
 - Groundwater Elevation Contour (20-Foot Interval)

Colusa Subbasin

Horizontal Datum: North American Datum of 1983 (NAD 83), California State Plane Zone II, feet.

Vertical Datum: North American Vertical Datum of 1988, feet (NAVD 88).

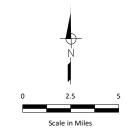
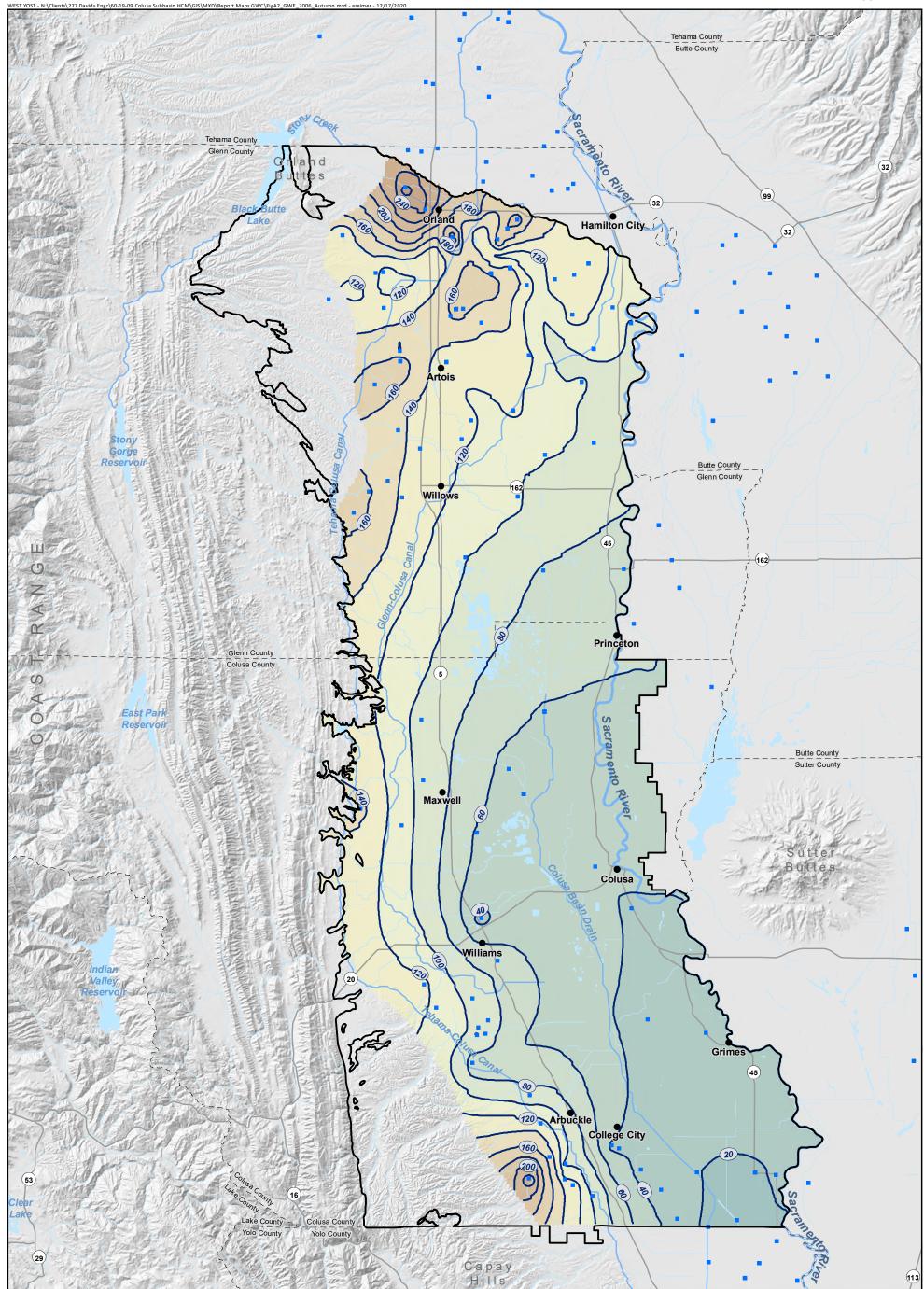
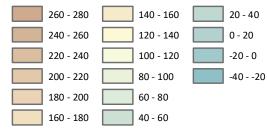


Figure 1

Groundwater Elevation Contours Spring 2006





- Well Used for Contouring
 - Groundwater Elevation Contour (20-Foot Interval)

Colusa Subbasin

Horizontal Datum: North American Datum of 1983 (NAD 83), California State Plane Zone II, feet.

Vertical Datum: North American Vertical Datum of 1988, feet (NAVD 88).

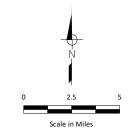
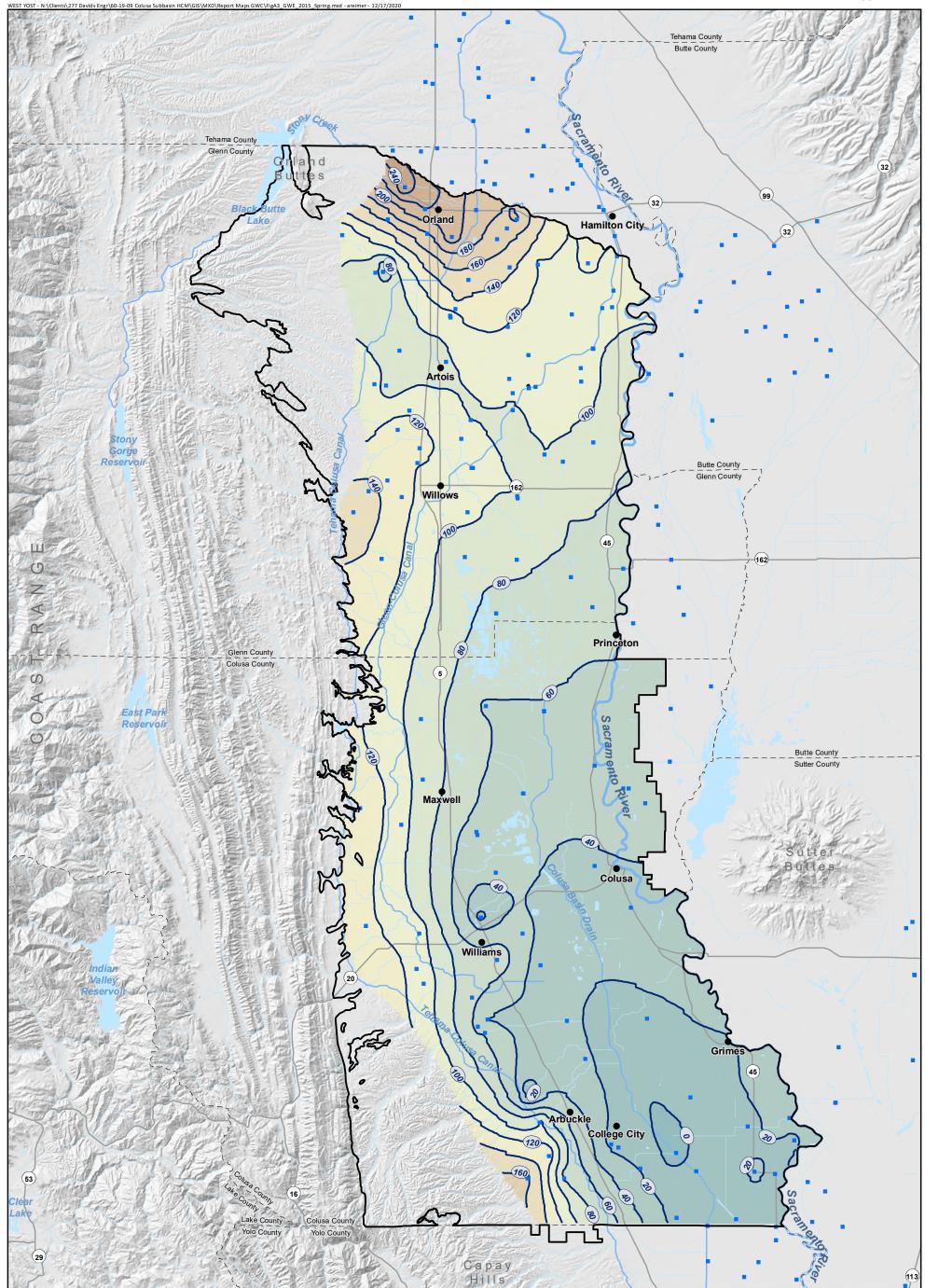
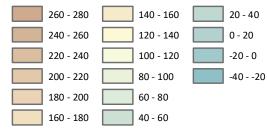


Figure 2

Groundwater Elevation Contours Fall 2006





- Well Used for Contouring
 - Groundwater Elevation Contour (20-Foot Interval)

Colusa Subbasin

Horizontal Datum: North American Datum of 1983 (NAD 83), California State Plane Zone II, feet.

Vertical Datum: North American Vertical Datum of 1988, feet (NAVD 88).

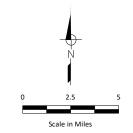
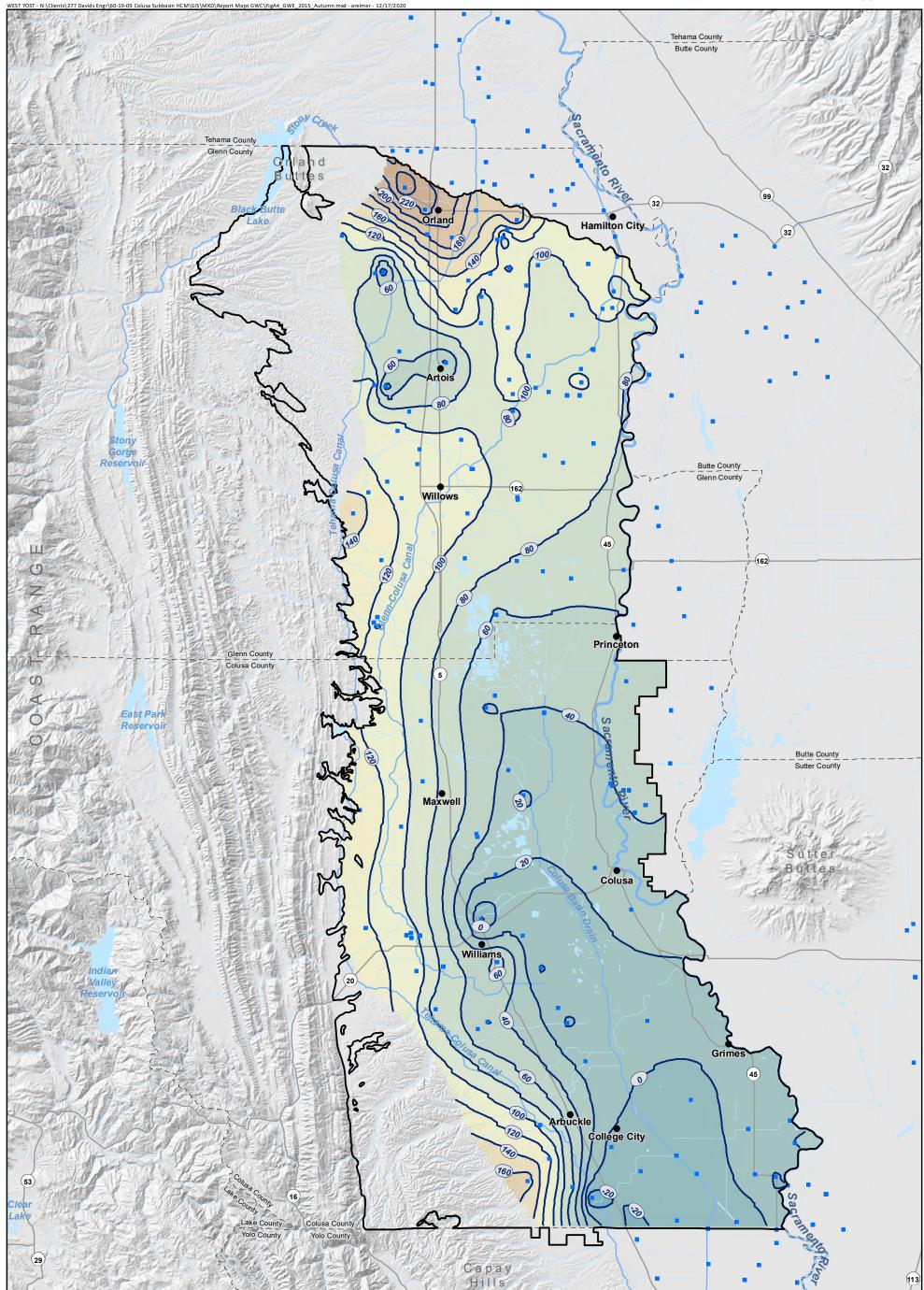
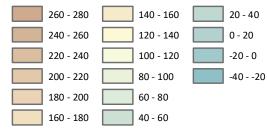


Figure 3

Groundwater Elevation Contours Spring 2015





- Well Used for Contouring
 - Groundwater Elevation Contour (20-Foot Interval)

Colusa Subbasin

Horizontal Datum: North American Datum of 1983 (NAD 83), California State Plane Zone II, feet.

Vertical Datum: North American Vertical Datum of 1988, feet (NAVD 88).

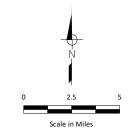
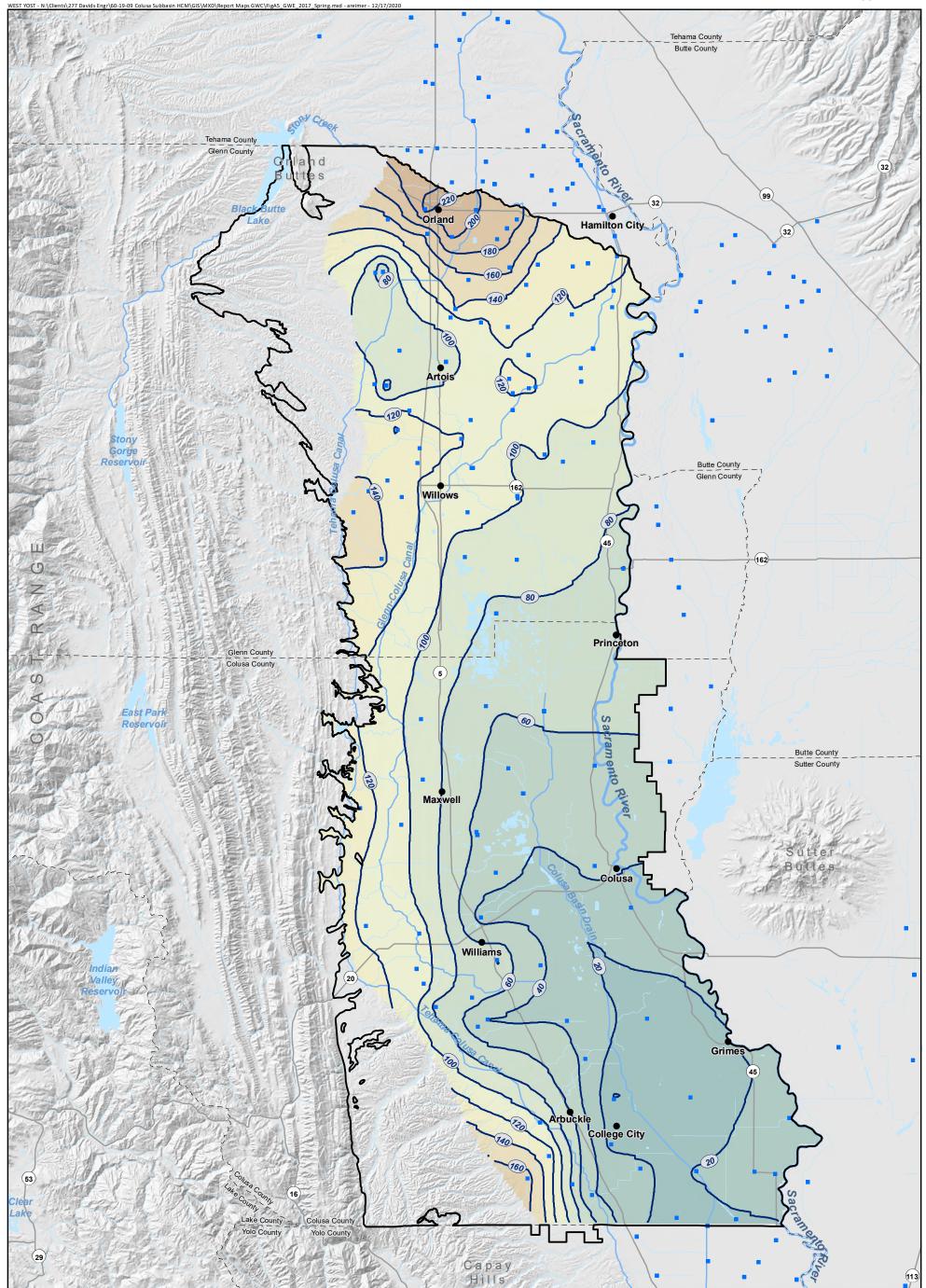
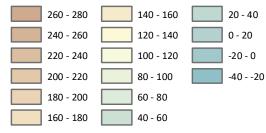


Figure 4

Groundwater Elevation Contours Fall 2015





- Well Used for Contouring
 - Groundwater Elevation Contour (20-Foot Interval)
 - Colusa Subbasin

Horizontal Datum: North American Datum of 1983 (NAD 83), California State Plane Zone II, feet.

Vertical Datum: North American Vertical Datum of 1988, feet (NAVD 88).

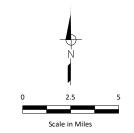
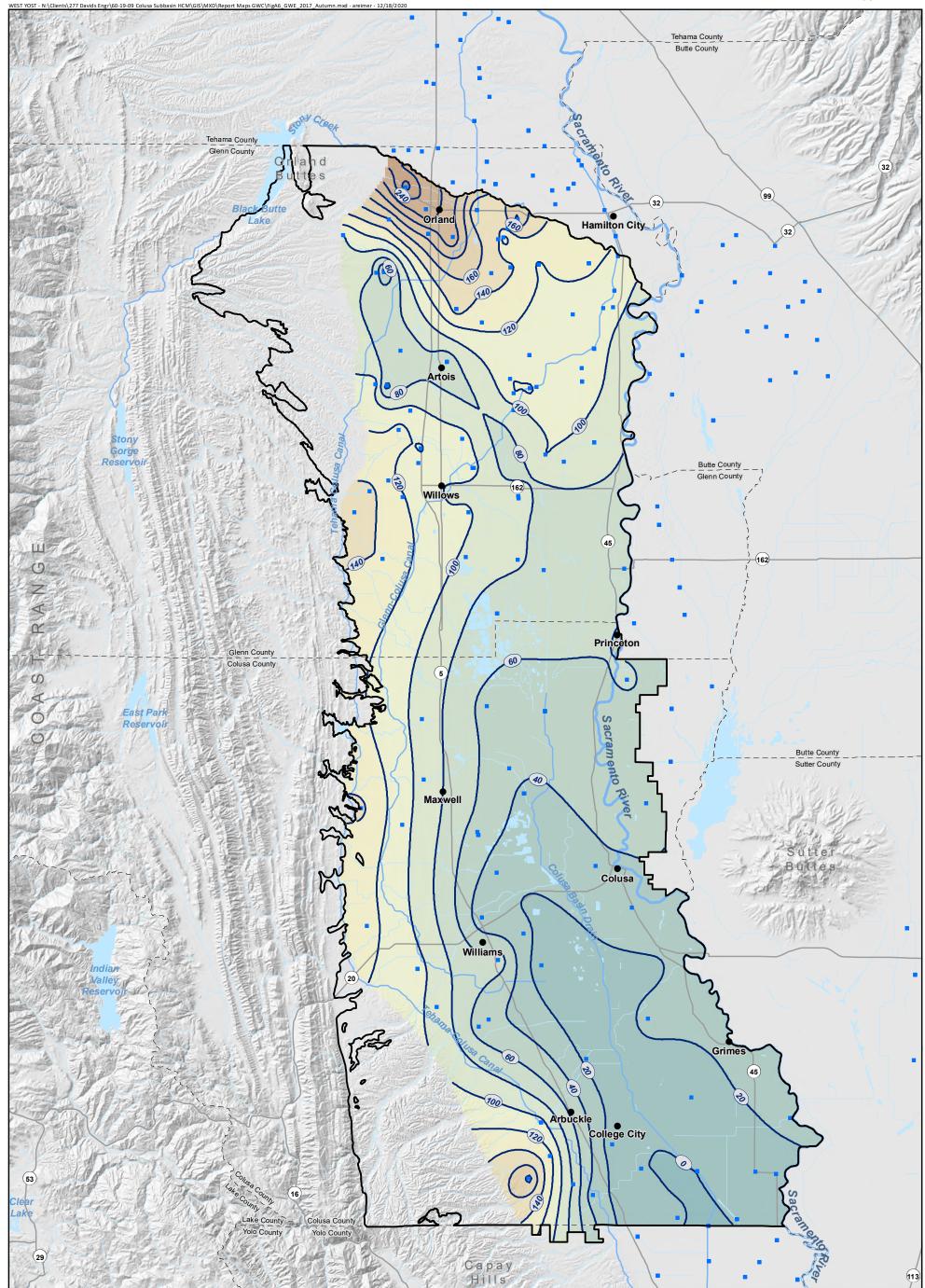
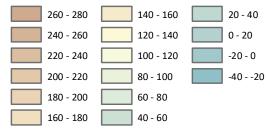


Figure 5

Groundwater Elevation Contours Spring 2017





- Well Used for Contouring
 - Groundwater Elevation Contour (20-Foot Interval)

Colusa Subbasin

Horizontal Datum: North American Datum of 1983 (NAD 83), California State Plane Zone II, feet.

Vertical Datum: North American Vertical Datum of 1988, feet (NAVD 88).

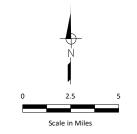
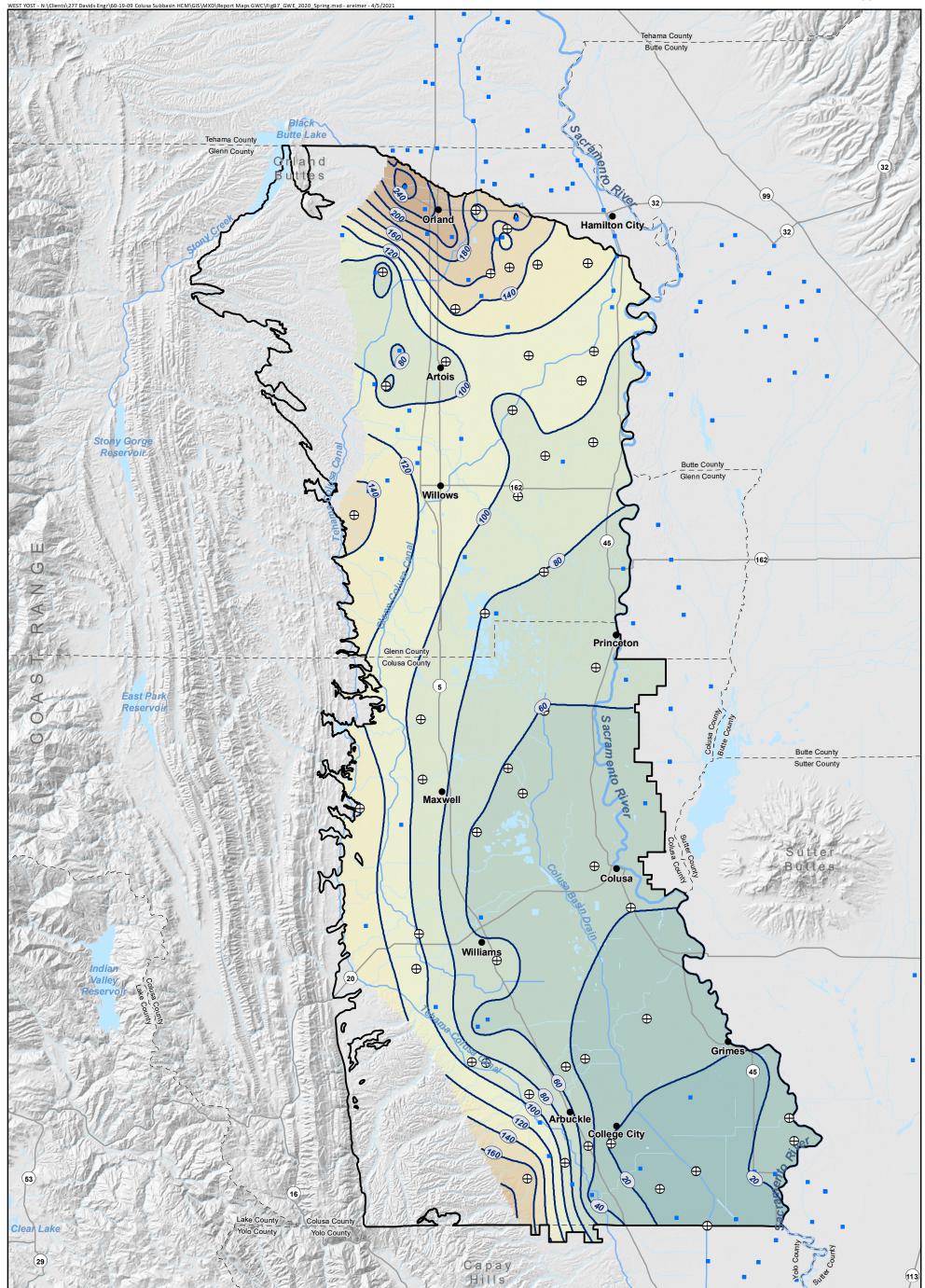
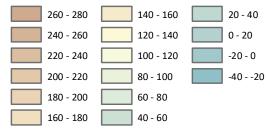


Figure 6

Groundwater Elevation Contours Fall 2017





- Well Used for Contouring
- Onitoring Network Wells
- Groundwater Elevation Contour (20-Foot Interval)
- Colusa Subbasin

Horizontal Datum: North American Datum of 1983 (NAD 83), California State Plane Zone II, feet.

Vertical Datum: North American Vertical Datum of 1988, feet (NAVD 88).

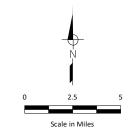
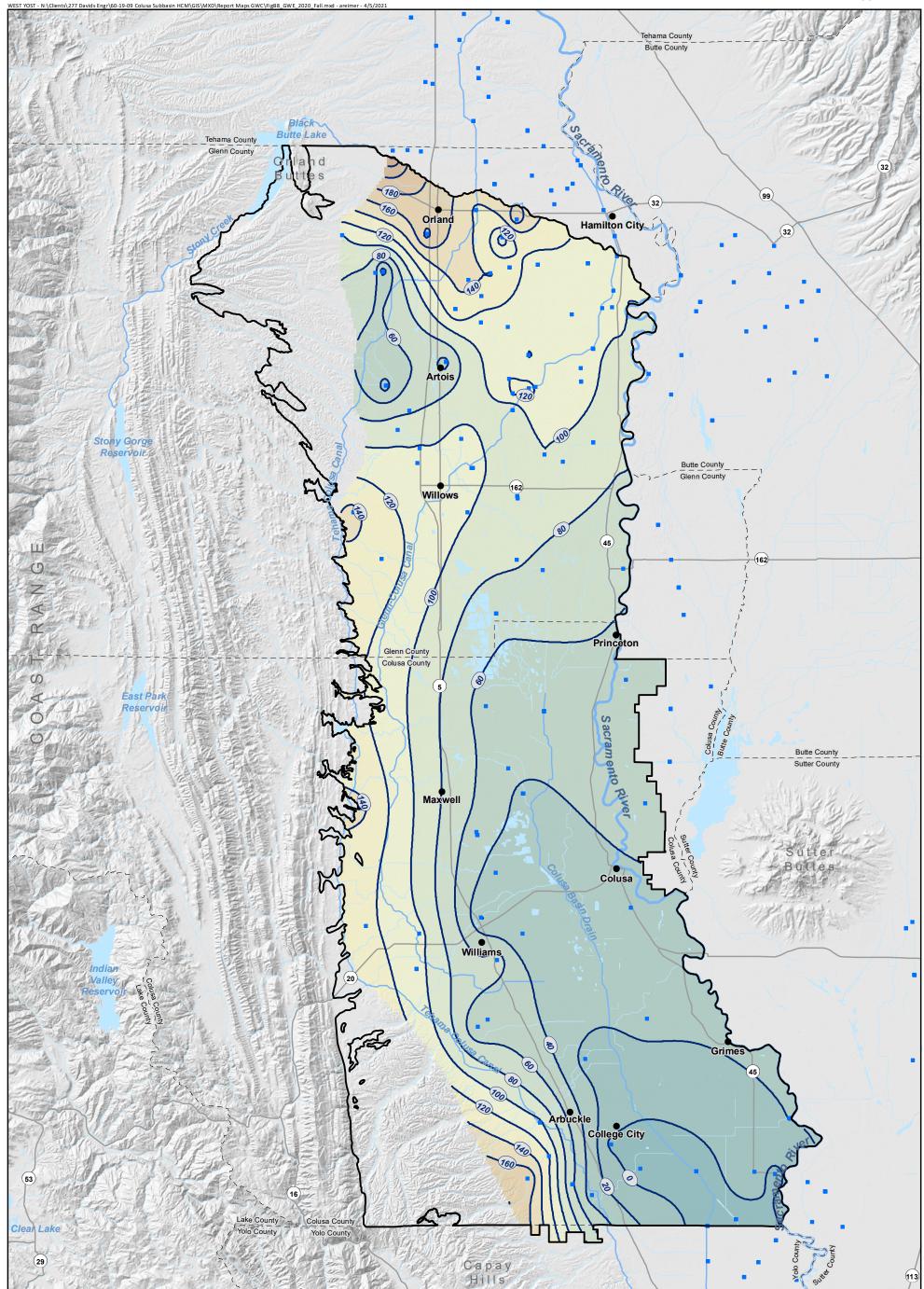
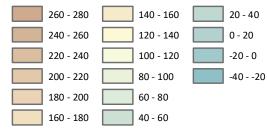


Figure 7

Groundwater Elevation Contours Spring 2020





- Well Used for Contouring
 - Groundwater Elevation Contour (20-Foot Interval)

Colusa Subbasin

Horizontal Datum: North American Datum of 1983 (NAD 83), California State Plane Zone II, feet.

Vertical Datum: North American Vertical Datum of 1988, feet (NAVD 88).

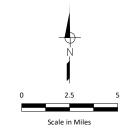
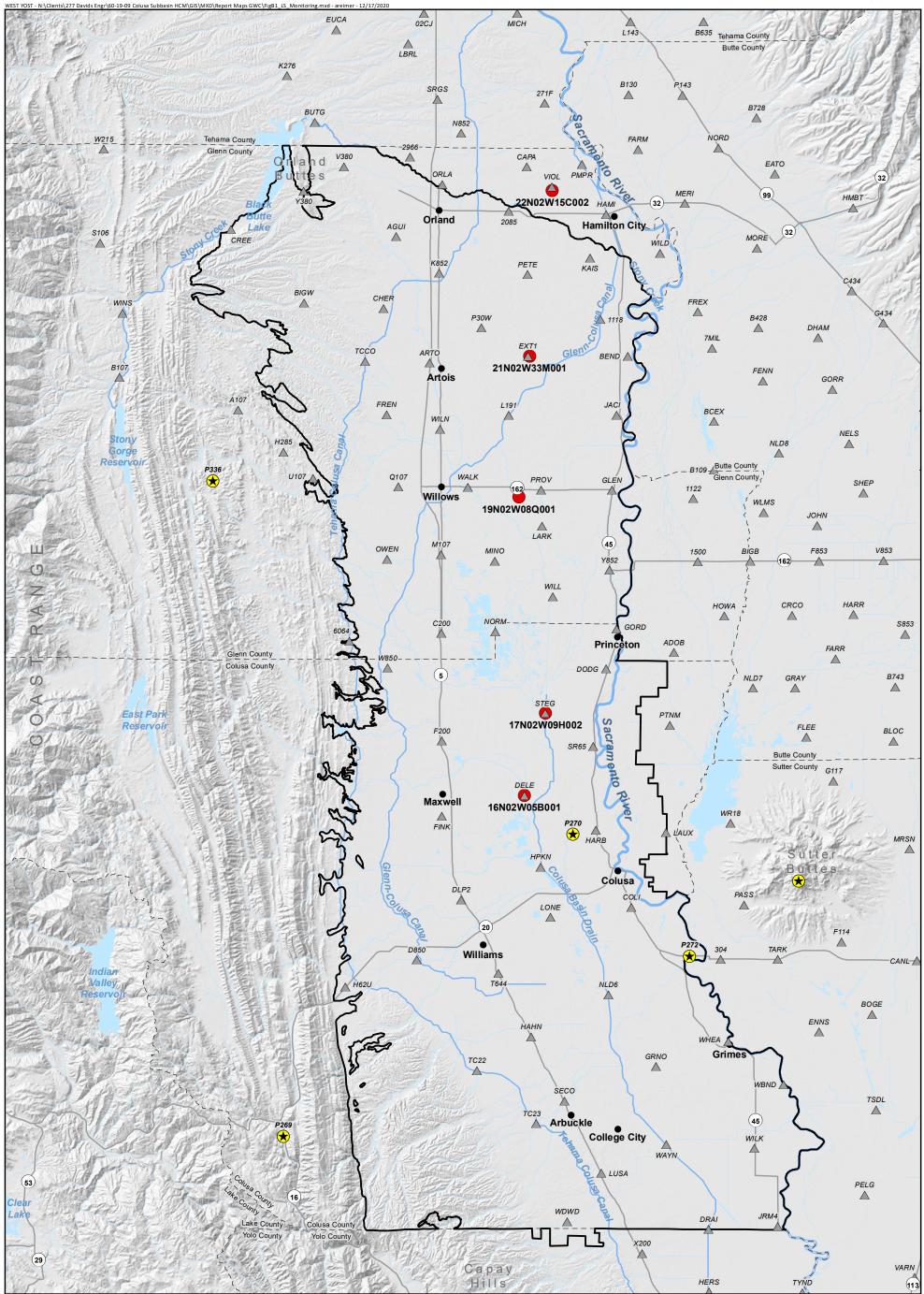


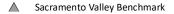
Figure 8

Groundwater Elevation Contours Fall 2020

Appendix 3C

Extensometer Measurements





- Extensometer
- \star Continuous GPS Station
 - Colusa Subbasin

Horizontal Datum: North American Datum of 1983 (NAD 83), California State Plane Zone II, feet.

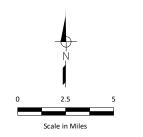
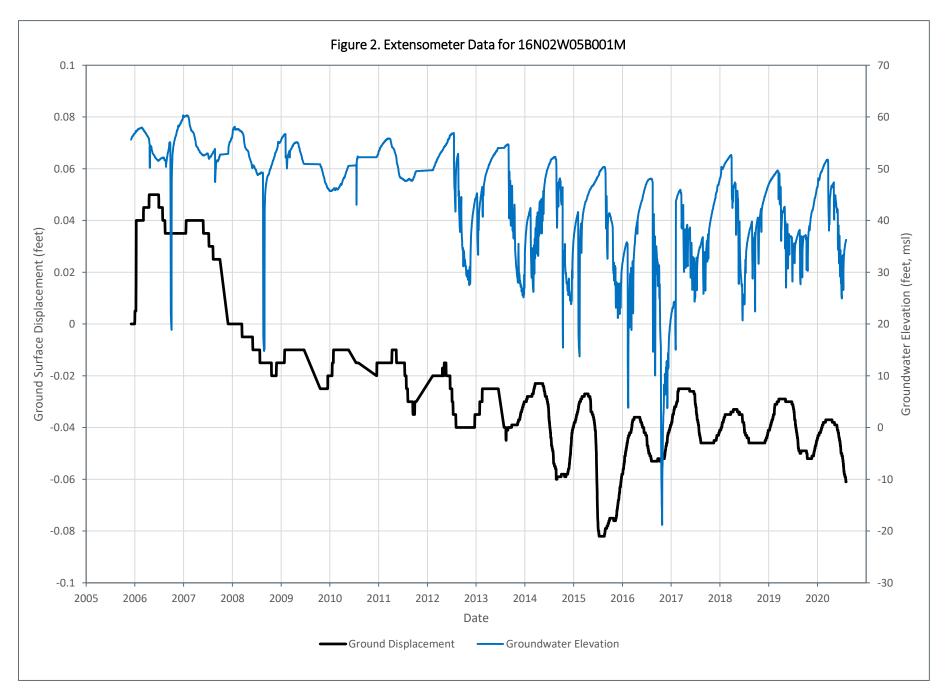
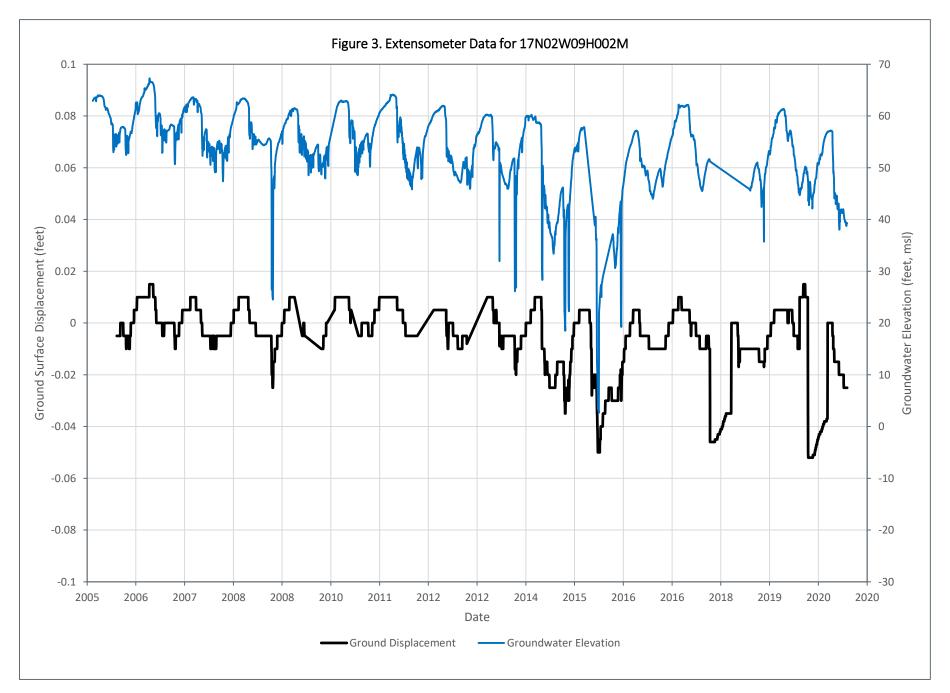
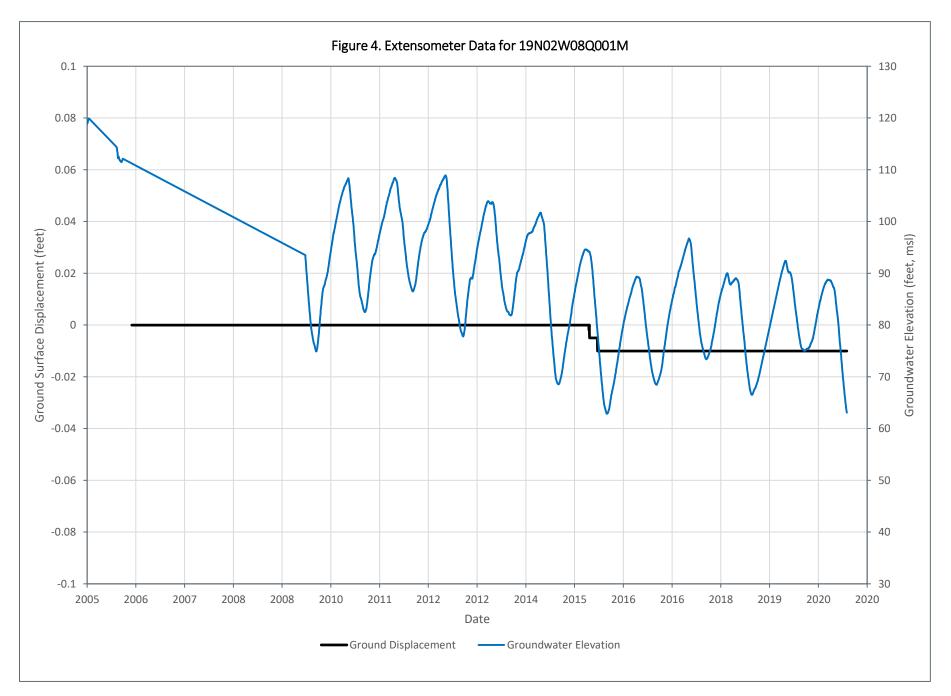


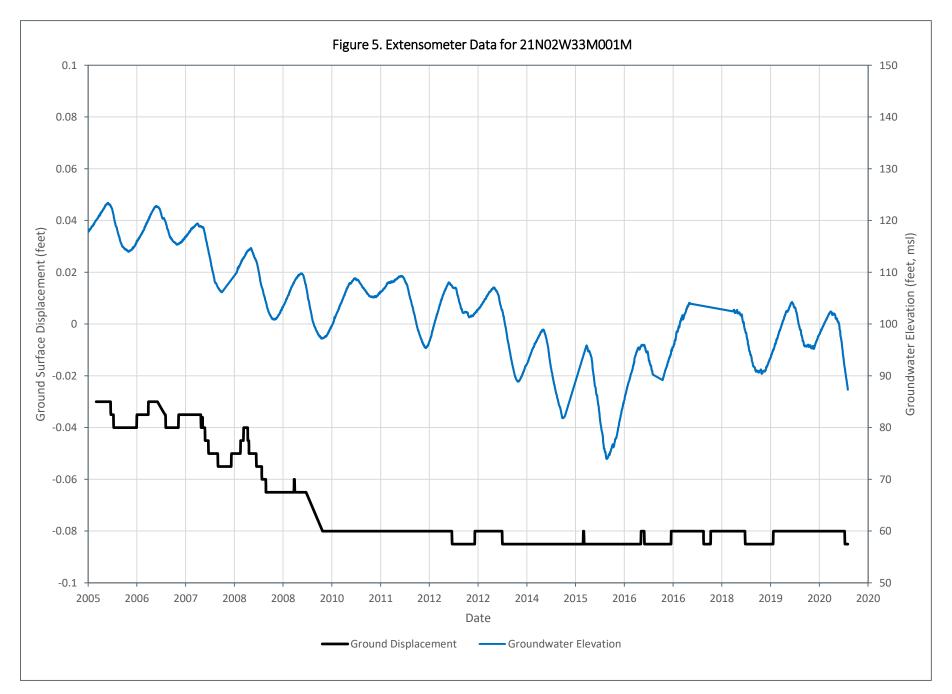
Figure 1

Land Subsidence Monitoring Networks

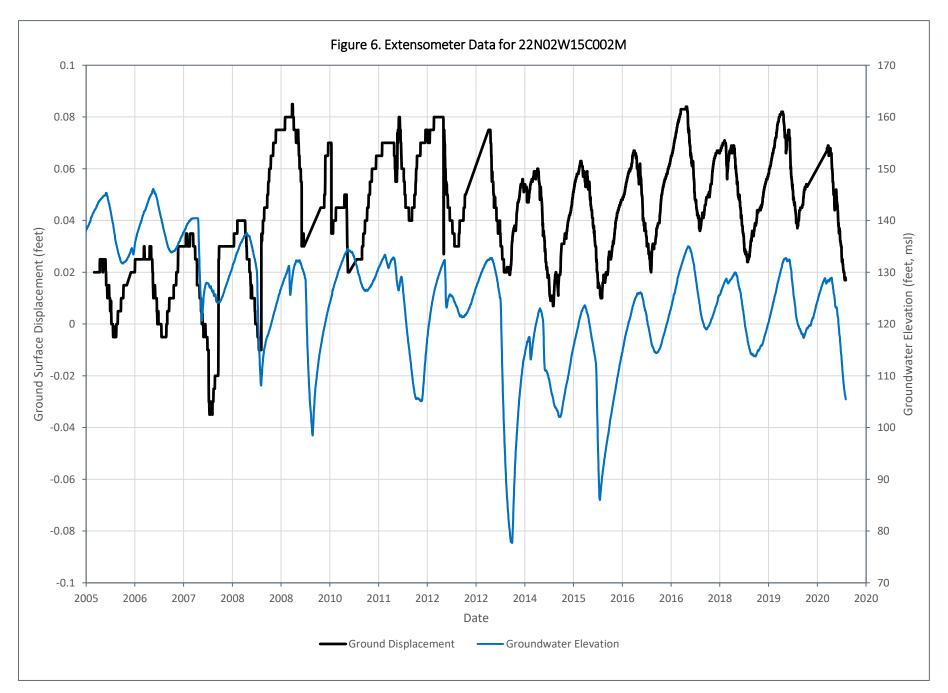








Colusa GSA and Glenn GSA Groundwater Sustainability Plan Last Revised: 12-15-20



Appendix 3D

Model Development and Calibration Technical Memorandum prepared by Woodard and Curran



TECHNICAL MEMORANDUM – C2VSimFG-Colusa Model Development and Calibration

TO:Colusa Groundwater Authority and Glenn Groundwater AuthorityPREPARED BY:Sara Miller/Emily Honn (Woodard & Curran), Katherine Klug (Davids Engineering)REVIEWED BY:Reza Namvar (Woodard & Curran), Grant Davids (Davids Engineering)DATE:April 1, 2021RE:C2VSimFG-Colusa Model Development and Calibration

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1. INTRODUCTION

This technical memorandum documents the development and calibration of the C2VSimFG-Colusa model, an integrated hydrologic flow model for the Colusa Subbasin (Subbasin) that is used to support development of the Subbasin Groundwater Sustainability Plan (GSP). The C2VSimFG-Colusa model was adapted from the Fine Grid California Central Valley Groundwater-Surface Water Simulation Model (C2VSimFG).

Specifically, this technical memorandum focuses on model enhancements and calibrations that were made to characterize the historical water budget in the Colusa Subbasin. Other model runs for current and projected water budget scenarios were adapted from the historical C2VSimFG-Colusa model inputs described in this technical memorandum. Those water budget inputs, assumptions, and results are described in the Colusa Subbasin GSP.

The C2VSimFG-Colusa model is based on the C2VSimFG Beta2 model released May 2019, with updates and enhancements to better represent local conditions in the Colusa Subbasin. C2VSimFG-Colusa runs the entire C2VSimFG model; however, data updates and calibration efforts are focused only on the area within and immediately surrounding the Colusa Subbasin. The Subbasin plus a five-mile buffer was chosen as the calibration area for C2VSimFG-Colusa (Figure 1).

The following sections describe specific enhancements to the C2VSimFG Beta2 inputs that were made to better reflect local water supply and water use characteristics; specific calibrations of model inputs to match available streamflow data, groundwater level data, and local water budget results; sensitivity analyses of the C2VSimFG-Colusa model; and a summary of the historical water budget results from the refined and calibrated historical model.

2. REFINEMENTS AND ENHANCEMENTS TO C2VSIMFG BETA2

The C2VSimFG-Colusa model was refined from C2VSimFG Beta2 through enhancements to specific model inputs, assumptions, and parameters related to the surface water and groundwater systems. Davids Engineering and Woodard & Curran refined and calibrated the surface and groundwater system water budgets for the portion of the model domain within and five miles surrounding the Colusa Subbasin.

The C2VSimFG-Colusa model inputs have been updated using the best available data and science, including information from publicly available data sources, past water and groundwater management planning documents, and other local water budgets computed for areas of the Colusa Subbasin. Data and information about specific water agencies was used to quantify water supply and water use within the agency's service area, to the extent permitted by the resolution of the C2VSimFG-Colusa model element grid.

Specific enhancements made to C2VSimFG Beta2 include changes to the simulation period, initial groundwater elevation, groundwater pumping, land use, evapotranspiration, soil properties, irrigation operations and efficiency, urban demand, surface water diversions, streambed elevation, and aquifer parameters. These changes are described in the sections below. Other changes made to calibrate specific root zone, stream, and aquifer characteristics are discussed further in Section 3. Unless otherwise noted, other inputs to the C2VSimFG Beta2 model were generally used directly in the C2VSimFG-Colusa model.

2.1 Historical Simulation Period

C2VSimFG Beta2 operates on a monthly time step and was initialized to simulate the period of October 1973 through September 2015, corresponding to water years (WY) 1974-2015. Time series data is provided in the C2VSimFG Beta2 input files for WY 1921-2015.



The C2VSimFG-Colusa model historical simulation period was updated to begin in October 1985 (WY 1986), simulating WY 1986-2015. The revised historical simulation period was selected based on the availability of local data for the Colusa Subbasin, and to allow sufficient time for the initial model conditions to stabilize prior to the start of the historical water budget analysis period (WY 1990-2015). Selection of the historical water budget period is described in the GSP.

2.2 Initial Groundwater Elevation

Initial groundwater elevations in C2VSimFG-Colusa were updated to reflect the new historical simulation start date in Fall 1985. Groundwater elevations for Fall 1985 for each model node and each layer were first extracted from C2VSimFG-Beta2 and then portions of the Subbasin were updated with elevations developed using the DWR's WDL database. A raster was developed using 202 observations from Fall 1985, supplemented with Fall 1984 and Fall 1986 readings. The difference between this observed data and simulated Layer 1 groundwater levels was calculated. For those areas with differences greater than 25 feet, initial groundwater heads were adjusted to reflect historical data. The groundwater level initial conditions for C2VSimFG-Colusa representing October 1985 are shown in Figure 2.



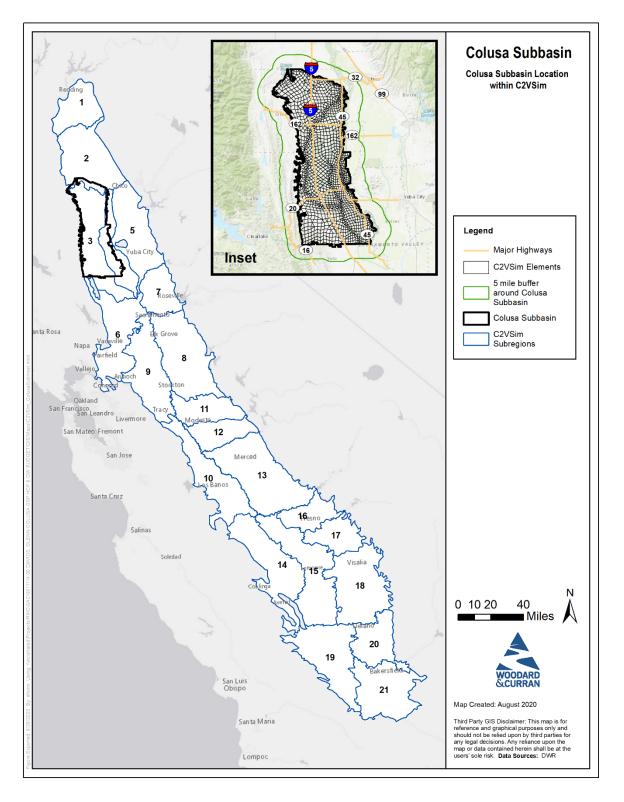


Figure 1: C2VSimFG and Location of Colusa Subbasin



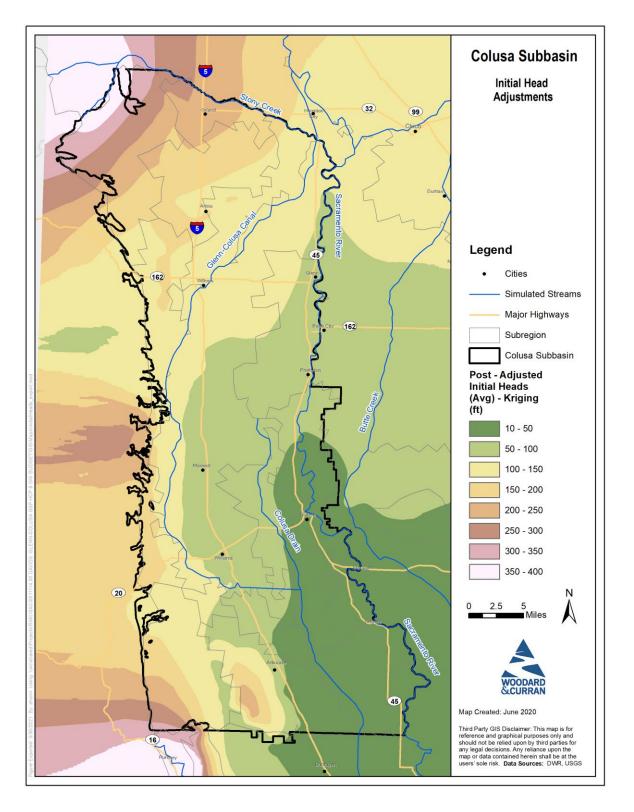


Figure 2: Initial Groundwater Elevation (Average of Layers 1-4)



2.3 Groundwater Pumping

Groundwater pumping in C2VSimFG-Colusa was refined by (1) specifying or refining groundwater pumping volumes in areas where data or other information on pumping was available, and by (2) assigning and refining virtual wells to simulate private groundwater pumping by agricultural and rural domestic well users based on demand in the model. The data sources and methods used to make these refinements are described below.

2.3.1 Specified or Refined Pumping

Groundwater pumping volumes in C2VSimFG-Colusa were specified or refined where possible based on groundwater pumping data reported by local water suppliers and based on other local information related to historical groundwater pumping.

Agricultural groundwater pumping previously enabled in C2VSimFG Beta2 for areas within the Sacramento, Delevan, and Colusa National Wildlife Refuges was turned off in C2VSimFG-Colusa, based on local information indicating that agricultural pumping does not occur within the bounds of these areas.

Urban groundwater pumping was refined for urban demand areas in the Colusa Subbasin based on pumping data reported by specific urban suppliers and public water systems (Table 2-1). Groundwater pumping by public water systems was summarized from Small Supplier Conservation Reports available through the California State Water Resources Control Board (SWRCB). Reports were available for the Cities of Colusa, Orland, and Williams and the Arbuckle and Maxwell Public Utility Districts. Groundwater pumping for use within the City of Willows was summarized from Urban Water Supplier Reports, also available through the SWRCB. Available groundwater pumping data were combined with population data to refine the model inputs that define per capita water use. As a result, the groundwater pumping calculated by the C2VSimFG-Colusa model was refined to match pumping data in years when these data were available. Additional information about these procedures and urban inputs are described further in Section 2.7.

Supplier Name	Data Source	Reported Years (Partial or Complete)
Arbuckle Public Utility District	SWRCB Small Supplier Conservation Report (ID CA0610001)	2013, 2015, 2016
City Of Colusa	SWRCB Small Supplier Conservation Report (ID CA0610002)	2013, 2015, 2016
City Of Orland	SWRCB Small Supplier Conservation Report (ID CA1110001)	2013, 2015, 2016
City Of Williams	SWRCB Small Supplier Conservation Report (ID CA0610004)	2013, 2015, 2016
Maxwell Public Utility District	SWRCB Small Supplier Conservation Report (ID CA0610003)	2013, 2015, 2016
California Water Service Company Willows	SWRCB Urban Water Supplier Report (ID CA1110003)	2014-2019

Table 2-1. Groundwater Pumping Data for Urban Suppliers and Public Water Systems

2.3.2 Private Groundwater Pumping

Private groundwater pumping quantities on an individual well basis are largely unknown, though aggregate estimates for private pumping are often included in planning documents (e.g., AWMPs, UWMPs, groundwater management plans). Private pumping in C2VSimFG-Colusa was estimated on an element basis by assigning two virtual wells at the



centroid of each model element. One well represents private agricultural pumping and one well represents rural residential pumping. The estimated pumping at these wells was calculated within C2VSimFG-Colusa as the additional volume of water necessary to meet agricultural and urban demand within that element, after distributing any other specified groundwater pumping and surface water deliveries. Figure 3 shows the total groundwater pumping in feet in each element in WY 2015.

The well screening interval or well depth was used to assign the model layers from which each simulated well extracts water. These assignments were made separately for the agricultural and rural residential wells in each element. Rural residential wells used a statistical analysis of typical perforation intervals developed for C2VSimFG. Agricultural wells were initially mainly assigned to pump from Layer 1, C2VSimFG's unconfined layer. Data provided by DWR and extracted from well completion reports was processed by Davids Engineering for updating agricultural pumping (Characterization of Groundwater Development in Colusa County and Evaluation of Potential Future Groundwater Demands TM by Davids Engineering, 2018). These data included information on well depths of irrigation wells drilled since 1970. These wells were mapped and assigned to C2VSimFG layers based on the total well depth (Figure 4 and Figure 5). Analysis of the north-western and south-western areas of the Subbasin revealed that most agricultural wells were pumping mainly from Layers 2 and 3. As a result, pumping in the majority of elements in these areas was edited so that 30% of groundwater pumping was from Layer 2 and 70% from Layer 3.



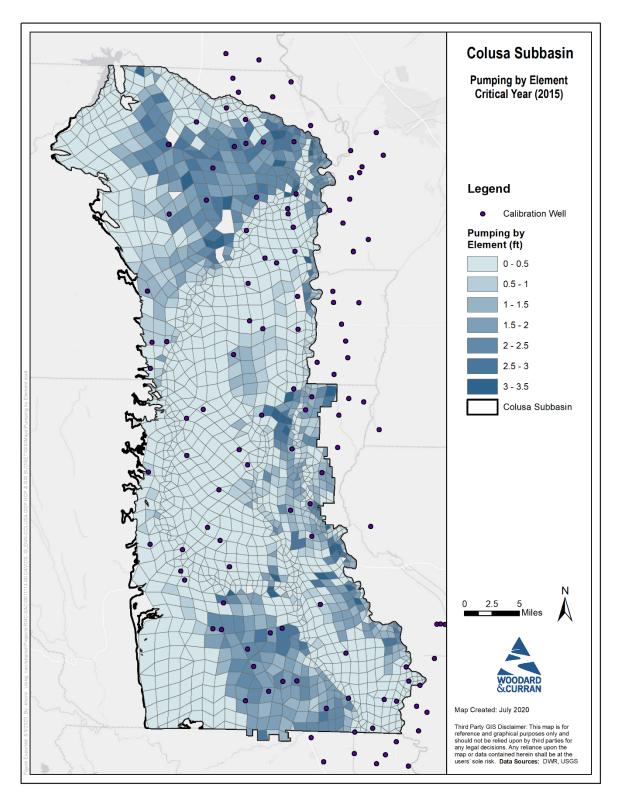


Figure 3: Element Pumping in Colusa Subbasin for WY 2015



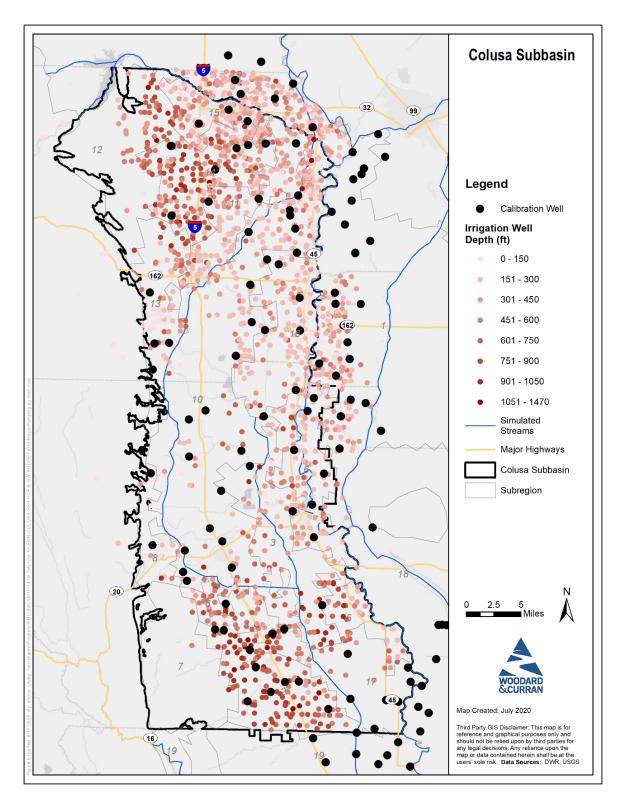


Figure 4: Irrigation Well Depths in Colusa Subbasin



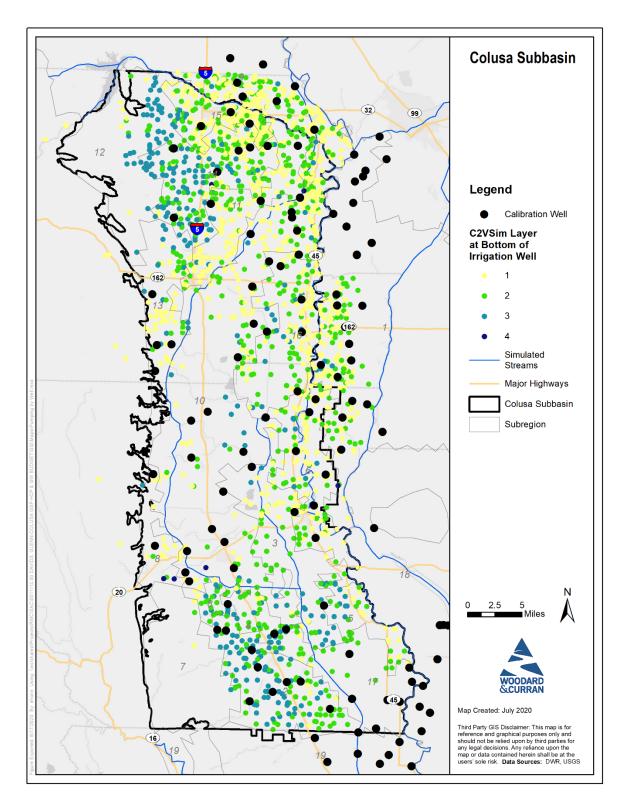


Figure 5: Irrigation Well Depths in Colusa Subbasin by Model Layer



2.4 Land Use

Annual land use in the Colusa Subbasin was estimated primarily based on spatially distributed land use information from DWR Land Use surveys in 1993, 1998, 2004, and 2009 and Land IQ¹ remote sensing-based land use identification in 2014. County Agricultural Commission land use areas were used to interpolate between years with available spatial land use information. The DWR LUEXINT Land Use Adjustment Preprocessor interpolation tool was implemented to create annual spatial cropping data sets in all years, compiling spatial land use data and creating estimates of spatial land use assignments in years when spatial data was unavailable. The spatial land use refinements were compared to the land use inputs to C2VSimFG Beta2, and were also reviewed by GSA representatives, Boards, and other local agencies to confirm the accuracy of annual patterns in crop acreage.

Land areas in the Colusa Subbasin were assigned to one of 29 land uses, and summarized under 22 land use classes. These land use classes are summarized by water use sector in Table 2-2. The area of each land use class was spatially assigned according to the percent area represented in each model element. Complete land use areas for the entire Colusa Subbasin are provided in the GSP.

Water Use Sector	C2VSimFG Land Use Class	C2VSimFG Land Use Code	Land Uses Included in Land Use Class
	Alfalfa	AL	Alfalfa
	Almonds & Pistachios	AP	Almonds, Pistachios
	Citrus & Subtropical	CS	Citrus, Olives
	Corn	CN	Corn
	Cucurbits	CU	Melons
	Dry Beans	DB	Beans (Dry)
	Grain	GR	Grain
	ldle	ID	Idle
Agricultural	Other Deciduous	OR	Misc Deciduous, Prunes
(Nonponded and Ponded)	Other Field	FL	Misc Field, Sudan, Sunflower
	Other Truck	TR	Misc Truck
	Pasture	PA	Pasture
	Rice with non-flooded decomposition	RICE_NFL	Rice with non-flooded decomposition
	Rice with no decomposition	RICE_NDC	Rice with no decomposition
	Safflower	SA	Safflower
	Tomato-Processing	TP	Tomatoes
	Vineyards	VI	Vineyards
	Walnuts	WN	Walnuts
Refuge	Seasonal refuges	REFUGE_SL	Wetlands
Native and	Native	NV	Native
Riparian Vegetation	Riparian	RV	Riparian, Water
Urban	Urban	UR	Urban, Semiagricultural

Table 2-2. Land Use Classes by Water Use Sector.

¹ Land IQ is a firm that was contracted by DWR to use remote sensing methodologies to identify crops in fields.



2.5 Evapotranspiration

Crop evapotranspiration (ET_c), or crop consumptive use, represents the volume of water that is lost to the atmosphere through both evaporation from the soil and transpiration from crop surfaces. A portion of the total water that crops and vegetation consume originates from precipitation (referred to as evapotranspiration of precipitation, or ET_{pr}) while other portions of ET_c may originate from applied water (referred to as evapotranspiration of applied water, or ET_{aw}).

C2VSimFG-Colusa computes a monthly root zone water budget, utilizing inputs of monthly ET_c together with other parameters that describe soil and land use characteristics in order to quantify all inflows and outflows through the root zone.¹ A root zone water budget is a generally accepted and widely used method to accurately and consistently track the portions of ET_c attributed to precipitation and applied water, respectively, as well as other water that is transmitted through the soil and plant surfaces (ASCE, 2016 and ASABE, 2007).

Monthly ET_c inputs for each crop and land use class in the Colusa Subbasin were adapted from the C2VSimFG Beta2 standard ET_c inputs. The C2VSimFG Beta2 inputs were first quality controlled and then adjusted to reflect local crop water use characteristics more accurately. Adjustments were determined through comparisons with local ET_c data and through discussion and consultation with selected local growers. Three main local ET_c data sources were compared to the C2VSimFG Beta2 inputs:

- METRIC Results (METRIC): Actual ET (ET_a) estimates were calculated using satellite imagery and the Mapping Evapotranspiration at High Resolution using Internalized Calibration (METRIC) (Allen, et al. 2007a) remotely-sensed surface energy balance model. METRIC ET_a estimates account for actual, observed conditions in the Colusa Subbasin that affect crop consumptive use, such as salinity, deficit irrigation, disease, fertilization, immature permanent crops, and crop canopy structure, and other factors. Studies by Bastiaanssen et al. (2005), Allen et al. (2007b, 2011), Thoreson et al. (2009), and others have found that when performed by an expert analyst, seasonal ET_a estimates by remotely-sensed surface energy balance models are expected to be within five percent of actual ET determined using other reliable methods. METRIC ET_a results are available for 2017 in the Sacramento Valley. Notably, METRIC results represent ET_a in a single, wet year (2017), rather than a multi-year average.
- Cal-SIMETAW Results (DWR): ET_c is computed in the California Simulation of Evapotranspiration of Applied Water (Cal-SIMETAW) model, and is publicly reported by the California Department of Water Resources (DWR) for 132 individual crops, 20 crop categories, and four land-use categories by county for use in the California Water Plan. Cal-SIMETAW is a daily, spatial crop water balance model that utilizes weather data, soil properties, crop coefficients, rooting depths, seepage, and other parameters to calculate ET_c and ET_{aw}. Monthly ET_c values were available from Cal-SIMETAW for 24 land use types in Glenn and Colusa Counties over the period spanning water years 2000-2015. The monthly ET_c values were averaged across both counties and all years for each land use type, and were summarized to average annual values for comparison.
- ITRC Results (Cal Poly): The Irrigation Training & Research Center (ITRC) at California Polytechnic State University, San Luis Obispo has compiled a database of typical ET_c rates for agricultural crop types across the various ETo Zones in California. These rates are publicly available online (<u>http://itrc.org/etdata/index.html</u>), and are offered for water budget and irrigation scheduling and design purposes. The ITRC provides typical

¹ The root zone is defined as "the upper portion of the soil where water extraction by plant roots occurs." (ASCE, 2016)



ET_c rates for various irrigation methods, two of which were considered for analyses in the Colusa Subbasin: surface irrigation systems and drip/micro irrigation systems. Across these irrigation systems, ITRC also summarizes ET_c for various relative precipitation conditions, with 1997 representing a "typical" year, 1998 representing a "wet" year, and 1999 representing a "dry" year.

 ET_c values in C2VSimFG-Colusa were refined to provide for similar results among all crops represented in the model and described in the various ET_c data sources above. Sample comparisons of the average annual ET_c for major crops are shown in Figure 6.



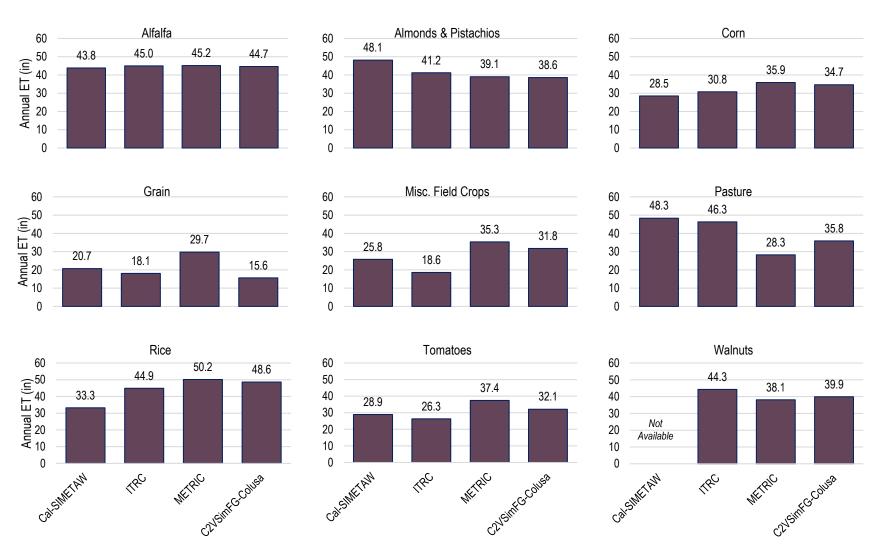


Figure 6. Average Annual* ET_c Comparison between Cal-SIMETAW, ITRC, METRIC, and C2VSimFG-Colusa for Major Irrigated Crops in the Colusa Subbasin (1990-2015 Average Annual Area Greater Than 10,000 acres). *Average summary years vary, see text for description of years considered.

C2VSimFG-Colusa Model TM



2.6 Other Irrigation and Crop Inputs

2.6.1 Irrigation Period

The irrigation period identifies the months during which irrigation is available to a crop or land use class. A value of one designates a month during which IDC calculates applied water demand for the land use class and simulates irrigation events, as needed. A value of zero designates a non-irrigation month during which IDC does not compute applied water and does not simulate irrigation for the land use class. Different monthly designations can be defined for different land use classes, if necessary.

In C2VSimFG-Colusa, the irrigation period was defined through time series inputs corresponding to typical crop irrigation seasons in the Colusa Subbasin. The irrigation period was also refined for rice in select months in order to better match the timing of planting and application of water in the winter months, according to local agricultural practices.

2.6.2 Reuse and Return Flow

The return flow fraction determines the proportion of applied water that can leave the land use area as runoff, while the reuse fraction determines the proportion of applied water that is captured and reused for irrigation. A value of one for each indicates that all applied water can leave as runoff, but that all applied water is captured and reused for irrigation. A value of zero for each indicates that no applied water leaves the land use cell, and that no water is reused for irrigation.

In C2VSimFG-Colusa, irrigation water return flow fractions were converted to timeseries inputs for all crops, with decreasing values that reflect changes in local irrigation practices over time, leading to reductions in runoff (Figure 7). Irrigation reuse fractions were unchanged from C2VSimFG Beta2, with values of 0 set for all crops.

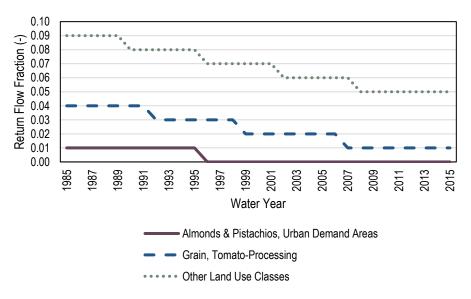


Figure 7. Return Flow Fractions in C2VSimFG-Colusa.



2.6.3 Ponded Crop Inputs

Ponding depth inputs to the model dictate the amount of water that is applied to ponded crops during irrigation. Monthly ponding depths for rice with non-flooded decomposition and rice with no decomposition were refined in C2VSimFG-Colusa to more accurately match early and late-season water application rates in the Colusa Subbasin in recent years (Table 2-3). Other ponding depths were unchanged from the standard C2VSimFG Beta2 inputs.

	Average Ponding Depth by Crop Type (ft; 1990-2015 Average)		
Month	Rice with Non-Flooded Decomposition	Rice with No Decomposition	
1	0.15	0.00	
2	0.02	0.00	
3	0.00	0.00	
4	0.01	0.02	
5	0.34	0.35	
6	0.38	0.38	
7	0.35	0.35	
8	0.25	0.25	
9	0.01	0.03	
10	0.09	0.00	
11	0.32	0.00	
12	0.26	0.00	

Table 2-3. Average Monthly Ponding Depths Updated in C2VSimFG-Colusa.

2.7 Other Urban Inputs

Urban inputs to C2VSimFG-Colusa were updated from the standard inputs to C2VSimFG Beta2 to accommodate new, locally-defined urban demand areas. These new urban demand areas in the Colusa Subbasin were specified as subdivisions of larger urban demand areas in C2VSimFG Beta2, corresponding to specific urban subareas for which water supply and water use data were available. The new urban demand areas corresponded to:

- Arbuckle (Public Utility District service area)
- City of Colusa
- City of Orland
- City of Williams
- City of Willows (California Water Service Company Willows service area)
- Unincorporated urban areas in the Colusa Subbasin

Data sources used to describe these new urban demand areas include SWRCB Small Supplier Conservation Reports and Urban Water Supplier Reports, population data and estimates from the California Department of Finance, census data, and the Willows 2015 Urban Water Management Plan.



Key urban inputs that were identified or refined for these new urban demand areas are population, groundwater pumping, per capita water use, urban pervious area fractions, and urban indoor water use fractions. These inputs are described below.

2.7.1 Population

The population in each urban demand area was quantified based on population data and population estimates available from the California Department of Finance or from United States Census Bureau. Annual population estimates were available from the Department of Finance for the Cities of Colusa, Orland, Williams, and Willows, and for Colusa and Glenn Counties in 1989-2015. The population in the Community of Arbuckle was summarized from available Census Bureau data in 1990, 2000, and 2010. The population in Arbuckle in other years was estimated through linear interpolation. The population of unincorporated areas in each county was calculated as the total population in that county (adjusted to the area overlying the Subbasin), minus the population in each city or community overlying the Subbasin.

2.7.2 Groundwater Pumping

Groundwater pumping data for urban suppliers and public water systems in the Colusa Subbasin were available from the SWRCB, as described in Section 2.3.1.

2.7.3 Per Capita Water Use

Per capita water use for the new urban demand areas was estimated based on available urban population and total urban water use from water supplier data, where available. Average per capita water use and data sources for each urban demand area are identified in Table 2-4.

Per capita water use in Willows was calculated in 1995-2015 from California Department of Finance population data and water use data. Per capita water use in 1989-1994 was calculated as the 1999-2008 average, taken to approximate average conditions observed in the early 1990s.

Per capita water use in Colusa, Orland, Williams, Arbuckle, and unincorporated areas in the Colusa Subbasin was calculated from the per capita water use in Willows, adjusted upward to accommodate slight differences in typical water use in these areas.

Average per capita water use values range from 231 gallons per capita per day in Willows and Colusa, to 277 gallons per capita per day in Orland.

Urban Demand Area	Average Per Capita Water Use (Gallons per Capita Per Day, 1990-2015)	Source
Arbuckle	254	Adjusted from Willows per capita water use (annual adjustment factor 1.1)
City Of Colusa	231	Assumed equal to Willows per capita water use (annual adjustment factor 1.0)
City Of Orland	277	Adjusted from Willows per capita water use (annual adjustment factor 1.2)
City Of Williams	242	Adjusted from Willows per capita water use (annual adjustment factor 1.05)

Table 2-4. Urban Per Capita Water Use for New Urban Demand Areas in Colusa Subbasin.



Urban Demand Area	Average Per Capita Water Use (Gallons per Capita Per Day, 1990-2015)	Source
Willows	231	Department of Finance population data; gross water use data (1995-2015); estimated as 199-2008 average (1989-1994)
Unincorporated urban areas in the Colusa Subbasin	254	Adjusted from Willows per capita water use (annual adjustment factor 1.1)

2.7.4 Urban Pervious Area Fractions

The urban pervious area fraction input is used by the C2VSimFG-Colusa model to quantify evapotranspiration (ET) and runoff from urban areas. It is assumed that only pervious areas are available for ET, and that no ET occurs in impervious areas. It is also assumed that all precipitation that falls on impervious areas becomes runoff. The runoff and ET of pervious areas is defined in C2VSimFG Beta2 according to typical conditions in urban areas.

The pervious fractions in the C2VSimFG-Colusa urban demand areas were updated to monthly values ranging from 0.40 to 0.49 in cities and incorporated urban demand areas (indicating less pervious area, and more developed area), and to a value of 0.70 in unincorporated urban demand areas (indicating more pervious area, and less developed area than cities and incorporated urban areas). These values were estimated to reflect the proportion of 'built-up' and undeveloped areas within the respective urban demand areas, and are similar to the pervious fractions specified for other urban areas in C2VSimFG Beta2.

2.7.5 Indoor Use Fractions

C2VSimFG-Colusa parses the total volume of applied water in each urban demand area into the amount of water that is used indoors versus outdoors based on user-defined indoor use fractions. A monthly pattern of indoor use fractions was calculated based on the average monthly average ratio of estimated indoor to outdoor water use in each city or community in the Colusa Subbasin in 2013, compared to total groundwater pumping that year. The year 2013 was taken to be representative of a typical year. The indoor use fractions in Table 2-5 were used for all new urban demand areas.

IS IOI New Orball Demanu P
Fraction of Total Urban
Water Used Indoors
1.00
0.93
0.57
0.47
0.37
0.30
0.28
0.32
0.36
0.41
0.59
0.69

Table 2-5. Urban Indoor Water Use Fractions for New Urban Demand Areas in Colusa	Subbasin.
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2.8 Diversions

Diversions are specified in C2VSimFG-Colusa to quantify the volume of water available for deliveries to specific land use areas in the Colusa Subbasin. The diversion specifications are also used by the model to quantify the volumes of nonrecoverable loss to the atmosphere through evaporation and recoverable loss to the GWS through seepage (infiltration of surface water).

Diversions that are used within the Colusa Subbasin are generally quantified based on outside data sources, including: delivery records reported by the United States Bureau of Reclamation (USBR), groundwater management or water planning documents developed by water agencies, and publicly available records maintained by the California State Water Resources Control Board (SWRCB) in the Electronic Water Rights Information Management System (eWRIMS). Data sources and updates to specific diversion volumes and specifications are described below.

Diversions of supply used outside the Subbasin are generally assumed to be equal to diversions data specified in C2VSimFG Beta2. Deliveries are generally calculated by C2VSimFG-Colusa as the water supply used to meet simulated crop water demands, after accounting for seepage and evaporation of the diverted supply.

Table 2-6 identifies new diversions added to C2VSimFG-Colusa, and Table 2-7 identifies diversions originally in C2VSimFG Beta2 that were changed in C2VSimFG-Colusa. Details about these added diversions and changes are described in the sections below.

Diversion ID	Description	Data Source	Average Volume in Historical Water Budget (AF per year, 1990-2015)
444	Orland Unit Water Users' Association (OUWUA) (South Canal only)	USBR delivery reports (1989- 2015); estimated other years	60,011
445	Colusa County Water District (WD)	USBR delivery reports (1989- 2015); estimated other years	50,967
446	Orland-Artois WD (OAWD)	USBR delivery reports (1989- 2015); estimated other years	42,688
447	Glenn-Colusa ID (GCID) (Tehama- Colusa Canal)	USBR delivery reports (1989- 2015); estimated zero other years (included in Div ID 458)	31,176
448	Westside WD	USBR delivery reports (1989- 2015); estimated other years	30,038
449	Kanawha WD	USBR delivery reports (1989- 2015); estimated other years	26,032
450	Glide WD	USBR delivery reports (1989- 2015); estimated other years	11,422
451	La Grande WD	USBR delivery reports (1989- 2015); estimated other years	4,307
452	Davis WD	USBR delivery reports (1989- 2015); estimated other years	2,319
453	4-M WD	USBR delivery reports (1989- 2015); estimated other years	1,947

Table 2-6. Diversions Added to C2VSimFG-Colusa.



Diversion ID	Description	Data Source	Average Volume in Historical Water Budget (AF per year, 1990-2015)
454	Holthouse WD	USBR delivery reports (1989-	1,059
		2015); estimated other years	,
455	Glenn Valley WD	USBR delivery reports (1989-	860
	,	2015); estimated other years	
456	Cortina WD	USBR delivery reports (1989-	825
		2015); estimated other years	
457	Myers-Marsh Mutual Water Company	USBR delivery reports (1989-	192
	(MWC)	2015); estimated other years	
		GCIDWIS and eWRIMS data	
458	GCID (Main Canal)	when available (1989-2015);	678,941
		estimated other years	
459	Reclamation District #108	USBR delivery reports (1989-	155,615
		2015); estimated other years	100;010
460	Princeton-Codora-Glenn ID	USBR delivery reports (1989-	60,28
400		2015); estimated other years	00,205
461	Provident ID	USBR delivery reports (1989-	50,790
401	FIOVID	2015); estimated other years	50,790
462	Sucomoro MIMC	USBR delivery reports (1989-	22,060
402	Sycamore MWC	2015); estimated other years	22,969
400	Margurall ID	USBR delivery reports (1989-	7 700
463	Maxwell ID	2015); estimated other years	7,796
404		USBR delivery reports (1989-	4 200
464	Carter MWC	2015); estimated other years	1,320
105		USBR delivery reports (1989-	5.050
465	Misc Sac River Riparian Diversions	2015); estimated other years	5,050
400		USBR delivery reports (1989-	0.005
466	Misc Sac River Riparian Diversions	2015); estimated other years	8,205
467	Misc Sac River Riparian Diversions	USBR delivery reports (1989-	
		2015); estimated other years	3,585
		USBR delivery reports (1989-	
468	Andreotti, Arnold and Arthur, et al	2015); estimated other years	2,296

Table 2-7. Diversions in C2VSimFG Beta2 Revised for C2VSimFG-Colusa.

Diversion ID	Description in C2VSimFG Beta2	Revision in C2VSimFG-Colusa	Diversion ID Replacement
19	Black Butte Reservoir to South Canal for Ag (06_PA)	No longer used (replaced with specified USBR diversions)	444
31	Tehama-Colusa Canal to Kirkwood WD for Ag (04_PA2)	Revised to exclude TCC diversions in Colusa Subbasin and account only for TCC diversions outside Subbasin	445-457
32	T-C Canal Deliveries to 07N_PA: Glide WD, Holthouse WD (portion 65%) Kanawha WD, Orland-Artois WD	No longer used (replaced with specified USBR diversions)	445-457



Diversion ID	Description in C2VSimFG Beta2	Revision in C2VSimFG-Colusa	Diversion ID Replacement
33	T-C Canal Deliveries to 07S_PA: 4-M WD, Colusa County WD, Cortina WD, Davis WD, Dunnigan WD, Glenn Valley WD, Holthouse WD (portion 35%), La Grande WD, Myers-Marsh MWC, Westside WD	No longer used (replaced with specified USBR diversions)	445-457
34	T-C Canal Deliveries to 07S_PA: 4-M WD, Colusa County WD, Cortina WD, Davis WD, Dunnigan WD, Glenn Valley WD, Holthouse WD (portion 35%), La Grande WD, Myers-Marsh MWC, Westside WD	No longer used (replaced with specified USBR diversions)	445-457
36	Glenn-Colusa Canal to Glenn-Colusa ID (58%) for Ag (08N_SA2)	No longer used (replaced with specified diversions from GCIDWIS and eWRIMS data)	458
37	Glenn-Colusa Canal to Glenn-Colusa ID (42%) for Ag (08S_SA2)	No longer used (replaced with specified diversions from GCIDWIS and eWRIMS data)	458
116	Sacramento River RM 178 to Provident ID, Princeton-Cordua- Glenn ID and miscellaneous diverters for Ag (08N_SA1)	No longer used (replaced with specified USBR diversions)	460-468
117	Sacramento River RB diversions between Butte City and Wilkins Slough to Princeton-Cordora-Glenn ID, Green Valley Corporation (Formerly Cannell, F.), and Maxwell ID (5%) and miscellaneous settlement contractors for Ag (08N_SA1)	No longer used (replaced with specified USBR diversions)	460-468
118	Sacramento River RB diversions between Butte City and Wilkins Slough to Maxwell ID (95%), Odysseus Farms, Robert Ditch Irrigation Company, Colusa Irrigation Company, Mehrhof Susan M. (Formerly Swinford Tract Irrigation Company), and Sycamore Family Trust (Formerly Davis, Olive P. et al) and miscellaneous settlement contractors for Ag (08S_SA1)	No longer used (replaced with specified USBR diversions)	460-468
119	Sacramento River RM 146 miscellaneous non-CVP diversions for Ag (08S_NA1)	No longer used (replaced with specified USBR diversions)	460-468



Diversion ID	Description in C2VSimFG Beta2	Revision in C2VSimFG-Colusa	Diversion ID Replacement
122	Sacramento River RB diversions between Butte City and Wilkins Slough to miscellaneous non-CVP diverters for Ag (08S_NA2)	Revised to account only for River Garden Farms and misc. outside Colusa SB	N/A
124	Sacramento River RB diversions between Butte City and Wilkins Slough to Reclamation District 108 and miscellaneous diverters for Ag (08S_SA3)	No longer used (replaced with specified USBR diversions)	459
126	Sacramento River RB diversions between Wilkins Slough and Knights Landing to RD 108, River Garden Farms and miscellaneous CVP diverters for Ag (08S_SA3)	No longer used (replaced with specified USBR diversions)	459

2.8.1 Diversions by USBR Contractors and Diverters

New diversions were added to C2VSimFG-Colusa to specify the monthly USBR deliveries to individual CVP contractors and diverters within the Colusa Subbasin (Diversion IDs 444-468). While many diversions of CVP supplies were specified in C2VSimFG Beta2, the original model largely aggregated the diversion volumes and element groups across multiple diverters. The new diversions were specified to instead distinguish the diversion volume and distribution area for each of the major diverters.

Diversions data were initially downloaded from USBR for all diverters that receive water from the Tehama-Colusa Canal (TCC), the Sacramento River, and other CVP supplies. Monthly data were quality controlled and reviewed for consistency. Diversion locations were generally identified from eWRIMS, and were used to classify diverters as within, outside, or partly within the Colusa Subbasin.

New diversions were specified in C2VSimFG-Colusa for all diverters within or partly within the Subbasin that receive water from the TCC and other CVP supplies, and for all diverters within or partly within the Subbasin that divert more than 3,000 acre-feet (AF) from the Sacramento River each year. Smaller diverters that divert less than 3,000 AF from the Sacramento River each year were grouped in C2VSimFG-Colusa based on their location along the Sacramento River. A small number of diverters identified in the USBR data diverted from an unknown location. It was assumed that a diversion from the TCC to support "fish facilities" in an unknown location was not within the Subbasin, while thirteen smaller diversions from the Sacramento River were assumed to be located within the Subbasin. These smaller diversions range from less than 100 AF per year to 2,900 AF per year, on average, with a total average volume of approximately 17,000 AF per year.

For diverters entirely within the Colusa Subbasin, the volume of diversions from USBR was taken directly from USBR reports in years when data were available (1989-2015). For diverters partially within the Colusa Subbasin, the volume of diversions from USBR was prorated based on the relative area inside the Subbasin. Any diversions originally specified in C2VSimFG Beta2 that accounted for these same USBR deliveries were used to quantify the diversion volumes in years prior to 1989, either directly or prorated based on area (if the diverter is partly within the Colusa Subbasin). In 1989-2015, these original C2VSimFG Beta2 diversions were either set to zero volume (for diverters within the Colusa Subbasin), or revised to deliver a reduced volume prorated by area to only those the elements located outside the Subbasin.



The diversion specifications were updated for all new and revised USBR deliveries, as needed. Diversion locations were updated to the stream node closest to the point of diversion identified in eWRIMS, where available. Distribution and recharge element groups were revised to match the diverter's service area, if available, as well as all changes in how the diversions are distributed inside and outside the Colusa Subbasin, refined to exclude areas within or outside the subbasin, as needed. The recoverable and nonrecoverable loss fraction of each new USBR diversion was updated based on local water budget information, where available.

2.8.2 Other Diversions

Diversions to Glenn-Colusa Irrigation District (GCID) were updated with diversion data available from GCIDWIS (1989-2015), and with eWRIMS data to account for winter water use.

Diversions to Reclamation District 108 (RD108), Princeton-Codora-Glenn Irrigation District (PCGID), and Provident Irrigation District (PID) were specified with all available data from the Districts between water year 1989-2015. Estimates of winter water used within these Districts were also specified, assuming similarity to the winter water use observed in GCID.

The diversion element groups and recharge element groups were updated for all new diversions, reflecting the service area of each District to the extent permitted by the model element resolution.

3. MODEL CALIBRATION

3.1 Calibration Goals

The goals of model calibration are (1) to achieve a reasonable water budget for each component of the hydrologic cycle modeled (i.e., land and water use, stream flow, and groundwater) and (2) to maximize the agreement between a) simulated and observed groundwater levels at selected well locations and b) simulated and observed streamflow hydrographs at selected gaging stations. These objectives are achieved through verification of the model input data and adjustment of model parameters.

3.2 Calibration Approach

Model calibration begins after data analysis and input data file development are completed. The calibration effort can be broken down into subsets that align with packages within the Integrated Water Flow Model (IWFM) platform. IWFM is used for development of C2VSim-FG Colusa model. As an integrated groundwater model, the results of each part of the simulation are interrelated with the other parts. The model calibration can be considered a systematic process that includes the following activities:

- Calibration of water budgets to other local water budgets through adjustment of root zone parameters
- Calibration of simulated groundwater levels and stream flows to observed data
- Comparison of calibration performance with the calibration targets
- Completion of additional model refinements, as necessary

C2VSimFG-Colusa was calibrated to achieve agreement with other local water budget results, measured stream flows and groundwater elevations, and groundwater elevation contours. The major data sources used to check model results include measured groundwater levels and contours and observed streamflow data. Though the model simulation period is October 1985 through September 2015 (30 years) or water years 1986 through 2015, the model calibration focused on water years 1990 through 2015 (26 years) because land and water use data for the model area is more reliable in those years.



3.3 Water Budget Calibration

Numerous water agencies and organizations use and manage water resources in areas overlying the Colusa Subbasin. For many of these entities, developing local water budgets is an important means of tracking and reporting water supply and water use in their service area. Local water budgets have been developed and are publicly available through various water management planning documents, including Agricultural Water Management Plans (AWMPs), Urban Water Management Plans (UWMPs), USBR Water Management Plans (WMPs), and Groundwater Management Plans.

The historical C2VSimFG-Colusa water budget results were evaluated for consistency with other local water budgets in the Subbasin by reporting and comparing subarea water budgets from the C2VSimFG-Colusa model with these local water budgets. To facilitate these comparisons, the historical C2VSimFG-Colusa model was divided into 38 subareas, several of which represent the service areas of specific water agencies and organizations.

Major flow paths considered in the calibration process included surface water deliveries, groundwater pumping, evapotranspiration, and deep percolation. Sample comparisons of these four parameters are shown in Figure 8 through Figure 10 for GCID, OAWD, and OUWUA. Other flow paths reported in both the local water budgets and the C2VSimFG-Colusa water budget results were also compared, as available. Comparisons were made in subareas and years when local water budget results were available to ensure similarity between major inflows to and outflows from land surfaces. Other comparisons were also made to confirm the accuracy of diversions, and the seepage and evaporation of diversions in the subarea.

Across the entire Subbasin, a key parameter considered during the calibration process was the crop consumptive use fraction (CCUF). CCUF is a ratio of the consumptive use of applied water (also referred to as or evapotranspiration of applied water, or ET_{aw}) to the total volume of applied water. High CCUF values close to 1.0 generally indicate higher irrigation efficiency, while lower CCUF values generally indicate lower irrigation efficiency. Discussion with local water users and review of irrigation methods throughout the Colusa Subbasin over time suggest that irrigation efficiency has generally increased over time, leading to increasing CCUF values over the historical water budget period.

Root zone parameters were refined, as needed, through an iterative process to calibrate the C2VSimFG-Colusa subarea water budget results (1) for agreement with local water budget results, and (2) to provide for typical historical CCUF values and increasing CCUF values over the historical water budget period, reflecting trends toward higher irrigation efficiency in the Colusa Subbasin.

For most areas, calibrations were made by adjusting the target soil moisture (TSM) for each land use class in C2VSimFG-Colusa. The TSM specifies the irrigation target soil moisture as a fraction of field capacity, and is used by C2VSimFG-Colusa to compute irrigation depths for each land use in the model domain. When simulating an irrigation event, C2VSimFG-Colusa will apply water until the soil reaches the specified percent of field capacity. TSM fractions in the C2VSimFG-Colusa were refined through several iterations of adjustment and comparison against local water budgets (Figure 8 through Figure 10) and evaluation of local CCUF values. Average CCUF values for crops in the Colusa Subbasin range from 0.55 for rice, which is typically irrigated with higher volumes of water relative to demand, to values between 0.80 and 0.85 for almonds, pistachios, and grain crops.

TSM fractions in the calibrated model range from 0.9 to 1.0 (i.e., 90 to 100 percent of field capacity) for rice, to values generally between 0.76 and 1.00 (i.e., 76 to 100 percent of field capacity) for other nonponded crops. These values approximate soil moisture resulting from common irrigation practices in the Sacramento Valley.



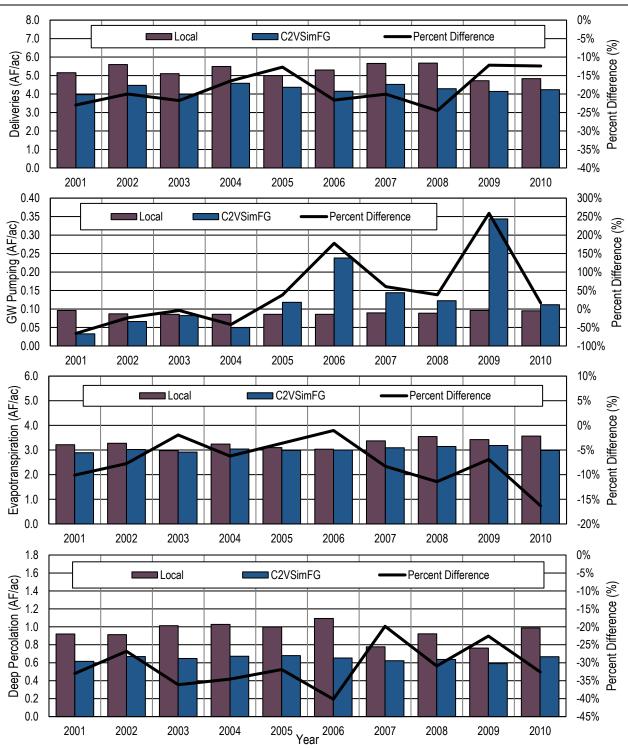


Figure 8. Comparison of Major Flow Paths from Local Water Budget and C2VSimFG-Colusa Results for the Glenn-Colusa Irrigation District.



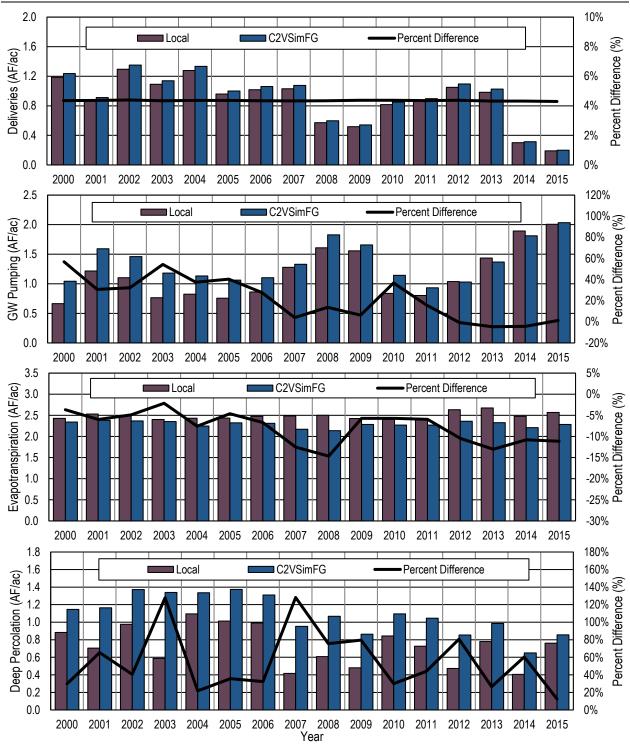


Figure 9. Comparison of Major Flow Paths from Local Water Budget and C2VSimFG-Colusa Results for the Orland-Artois Water District.



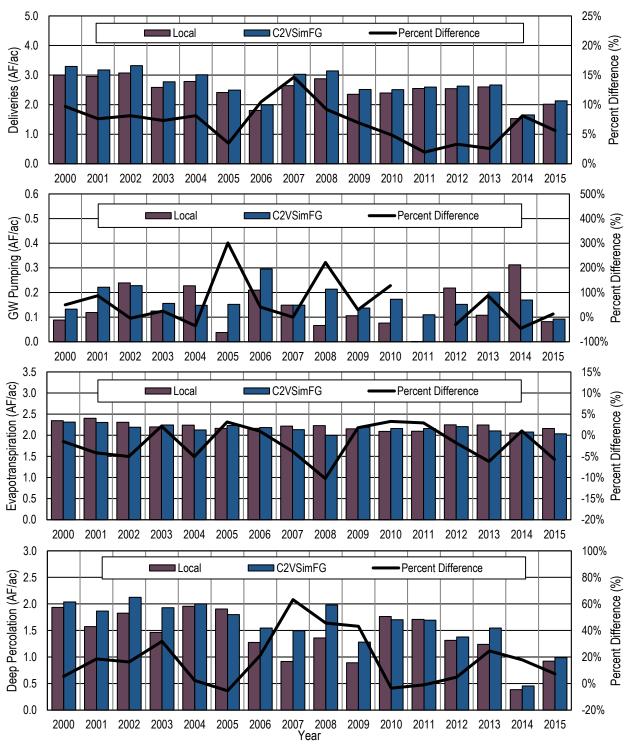


Figure 10. Comparison of Major Flow Paths from Local Water Budget and C2VSimFG-Colusa Results for the Orland Unit Water Users Association.



3.4 Streamflow Calibration

The major streams in the C2VSimFG-Colusa are Stony Creek, Sacramento River, Glenn-Colusa Canal, and Colusa Drain. Streamflow calibration is primarily performed by comparing the simulated streamflow at 6 locations with local data from 9 stream gages (Table 3-1 and Figure 11). Data for these gages came from the United States Geological Survey (USGS) and California Data Exchange Center (CDEC).

Stream	Stream Node	Agency	Gage Name	Period of Record	
Stony Creek	3315	USGS	USGS 11388500: Stony Creek Near Hamilton City	January 1941 to September 1973	
Sacramento River	3341	CDEC	CDEC ORD: Sacramento River at Ords Ferry	January 1984 to present	
Sacramento River	3370	USGS	USGS 11389000: Sacramento River at Butte City, CA	October 1938 to June 1995	
		CDEC	CDEC BTC: Sacramento River at Butte City	January 1998 to present	
Sacramento River	3502	USGS	USGS 11389500: Sacramento River at Colusa, CA	April 1921 to present	
		CDEC	CDEC COL: Sacramento River at Colusa	January 1984 to present	
Sacramento River	3502	USGS	USGS 11390500: Sacramento River Below Wilkins Slough Near Grimes, CA	October 1938 to present	
		CDEC	CDEC WLK: Sacramento River Below Wilkins Slough	January 1984 to present	
Colusa Drain	3764	CDEC	CDEC CDR: Colusa Drain Near Hwy 20	November 1997 to present	

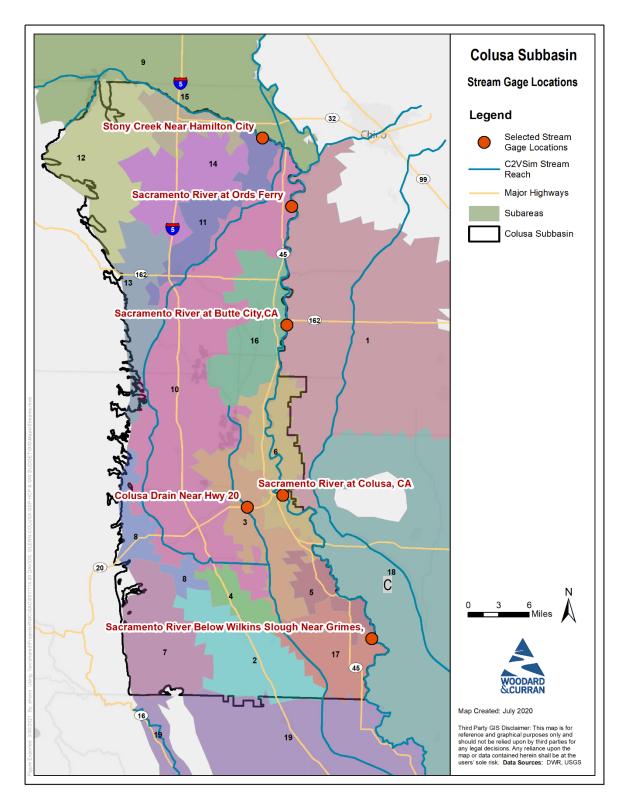
Table 3-1: Summary of C2VSimFG-Colusa Streamflow Calibration Gages

Colusa Drain¹, as the major collector of excess irrigation flows or rice field runoff, was analyzed in the central portion of the Subbasin bounded by Glenn-Colusa Canal and Sacramento River. Most of the runoff in this region ends up flowing into Colusa Drain. Groundwater elevations in the vicinity of Colusa Drain are closely influenced by volume of runoff collected by Colusa Drain. It was necessary to increase shallow groundwater flow into the drain to lower the simulated groundwater levels to match the observed groundwater levels. This was achieved by adjusting the streambed conductance and elevation of Colusa Drain nodes in order to increase the capacity of flows into Colusa Drain. Simulated streamflows of Colusa Drain were compared to measured streamflows at CDEC CDR station in Colusa Drain.

Streamflow calibration included analysis of the streambed hydraulic conductivity and stream gain from or loss to the groundwater system. Simulated stream flows were compared with observed records and exceedance charts were also used to check the model performance when simulating high and low flows at each gage location. Calibration results for select stream gages (except Stony Creek due to lack of observation data) are included in Figure 12 through Figure 16.

¹ Also commonly referred to as the Colusa Basin Drain.









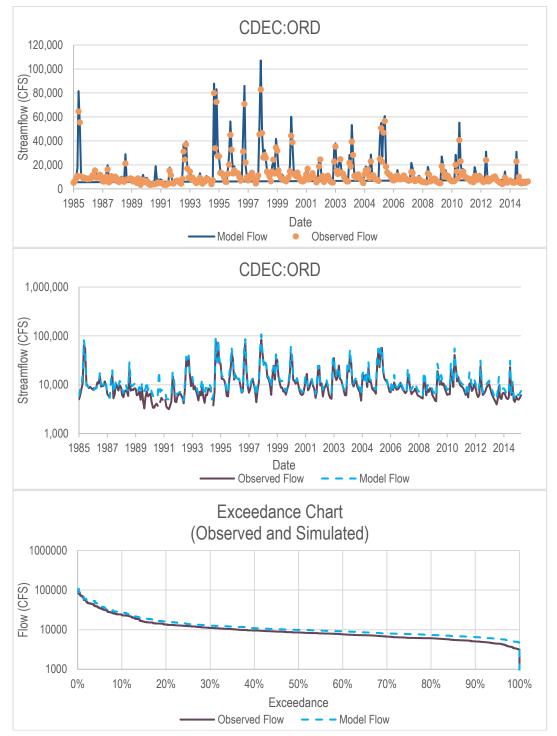


Figure 12: Streamflow Calibration for Sacramento River at Ords Ferry



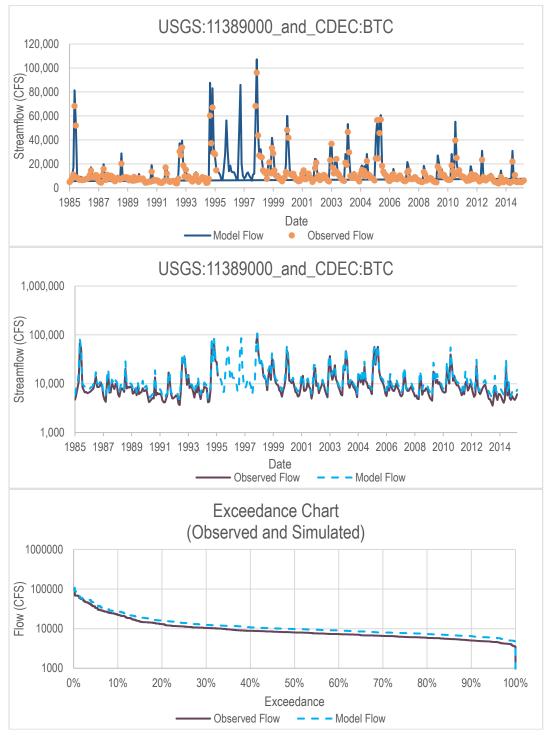


Figure 13: Streamflow Calibration for Sacramento River at Butte City



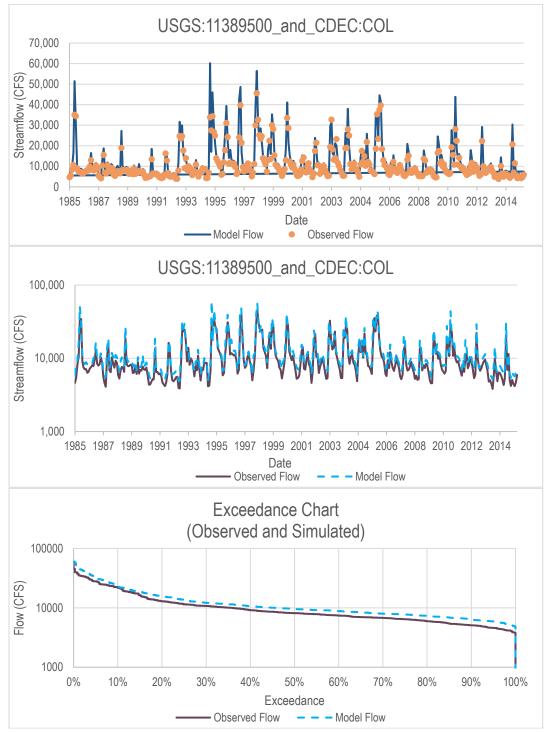


Figure 14: Streamflow Calibration for Sacramento River at Colusa



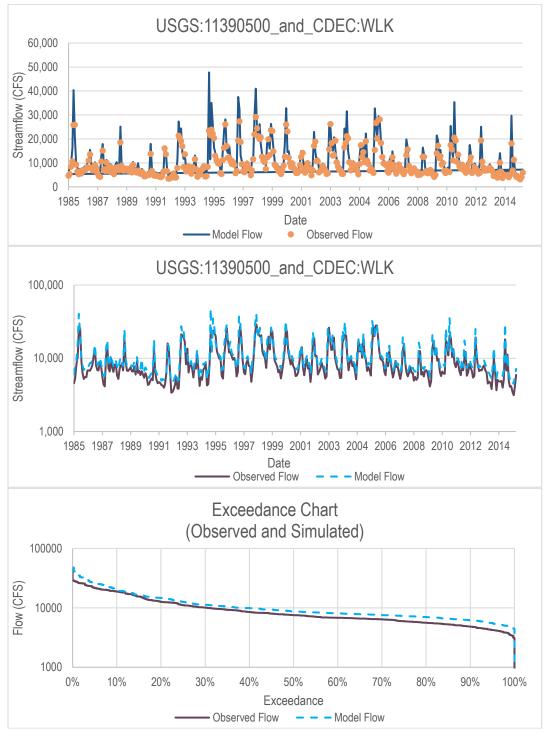


Figure 15: Streamflow Calibration for Sacramento River below Wilkins Slough



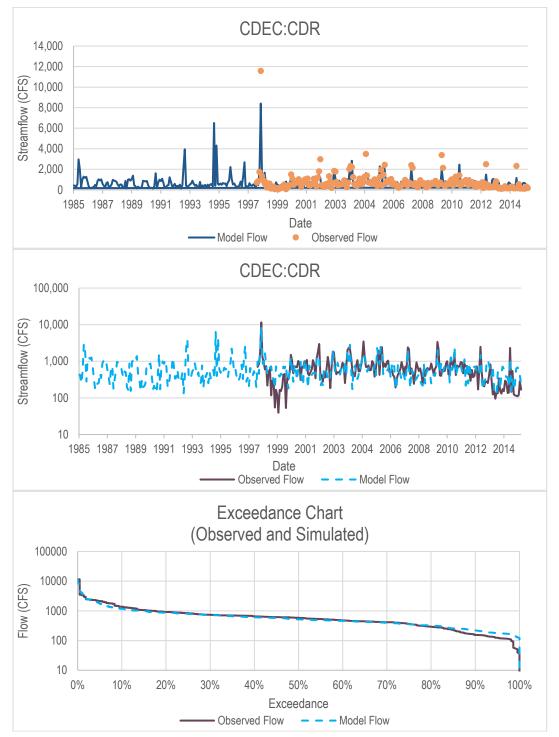


Figure 16: Streamflow Calibration for Colusa Drain near Highway 20



3.5 Groundwater Level Calibration

Like streamflow calibration, the goal of groundwater level calibration is to achieve reasonable agreement between the simulated and observed groundwater levels at the calibration wells. Within Colusa Subbasin and a five-mile buffer around the Subbasin, 740 wells were evaluated for developing groundwater observation locations to track calibration at both a regional and local scale. These wells came from DWR's California Statewide Groundwater Elevation Monitoring (CASGEM) Program and the groundwater level monitoring network for Colusa Subbasin. The calibration wells were filtered based on their period of observation records, availability of construction information (e.g., well depth and screen intervals), number of measurements between 1990 and 2015, number of spring measurements (assumed to be March, April, or May), spatial location, and active completions (for nested wells). Checks were also made on whether wells were included in Colusa Subbasin's groundwater level monitoring network, Butte Basin Groundwater Model's (BBGM) calibration wells, and C2VSimFG's calibration wells. An ultimate set of 252 wells were chosen that are representative of the long-term conditions of groundwater levels both at a local and regional scale in the area in and around the Colusa Subbasin. Calibration well locations are shown in Figure 17.

Calibration wells were assigned to a model layer based on the well top/bottom perforations or total well depth. C2VSimFG-Colusa's model layering was not altered and is described in C2VSimFG documentation. Of the 252 calibration wells, 134 were assigned to Layer 1 (unconfined aquifer), 70 to Layer 2, and 48 to Layer 3 which extends to the base of fresh water. Layer 4, which is saline water, extends down to the base of continental deposits and typically does not contain any wells.

Simulated groundwater levels were calibrated to observed levels through adjustments to model aquifer parameters including hydraulic conductivity, specific storage, and specific yield. The goal of groundwater level calibration is to achieve the maximum agreement between simulated and observed groundwater elevations at calibration wells while maintaining reasonable values for aquifer parameters. The groundwater level calibration was performed in two stages:

- The initial calibration effort was focused on the regional scale to verify hydrogeological assumptions made during model data development and confirm the accuracy of general groundwater flow directions. During this iteration, simulated groundwater elevation trends, flow directions, and groundwater gradients were compared to measured data. DWR's groundwater level contours for Fall 2015 and West Yost's draft contours for Spring 2006 and Spring 2015 were used to evaluate C2VSimFG-Colusa groundwater contours from matching time periods. Figure 18 through Figure 20 show the simulated C2VSimFG-Colusa groundwater to DWR contours for Fall 2015 and West Yost contours for Spring 2015. Fall 2015 and west Yost contours for Spring 2006 and Spring 208 and Spring 2006 and Spring 2006 and Spring 2015. Fall 2015 also represents the end of simulation groundwater levels.
- The second stage of calibration of groundwater levels was to compare the simulated and observed groundwater levels at each calibration well. This comparison provides information on the overall model performance during the simulation period, focusing on the calibration period of water years 1990 through 2015. To minimize the effects of groundwater pumping on groundwater elevations, only spring groundwater levels (assumed to be March, April, or May) were used to calculate calibration statistics. The simulated groundwater elevations at the 252 calibration wells were compared with corresponding observed values for concurrence in long-term trends as well as spring water levels.

The results of the groundwater level calibration indicate that the C2VSimFG-Colusa reasonably simulates the longterm hydrologic responses under various hydrologic conditions in Colusa Subbasin. Calibration statistics are provided in Section 6. Figure 21 shows a selection of calibration wells with their resulting groundwater level hydrographs. Appendix A shows all calibration groundwater level hydrographs. Appendix B shows all nested well locations with their hydrographs plotted on the same plot.



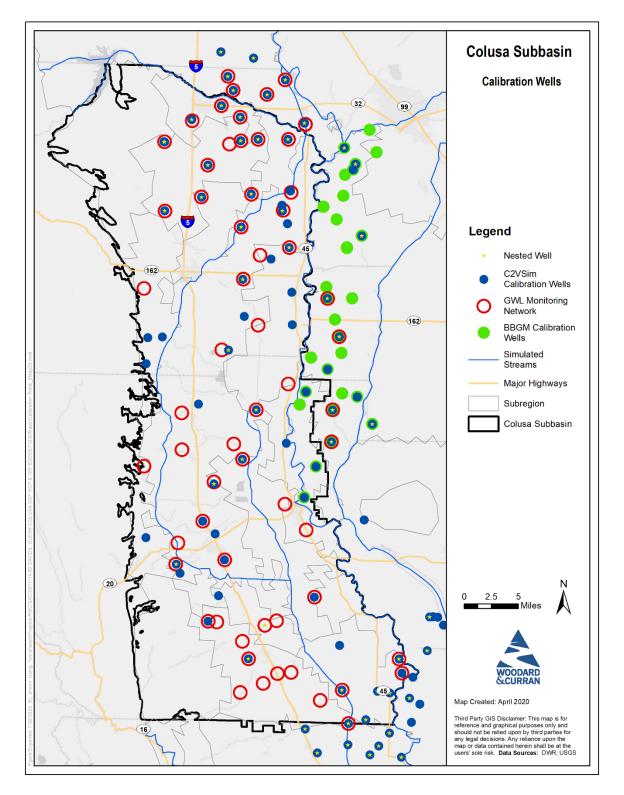


Figure 17: Groundwater Calibration Well Locations



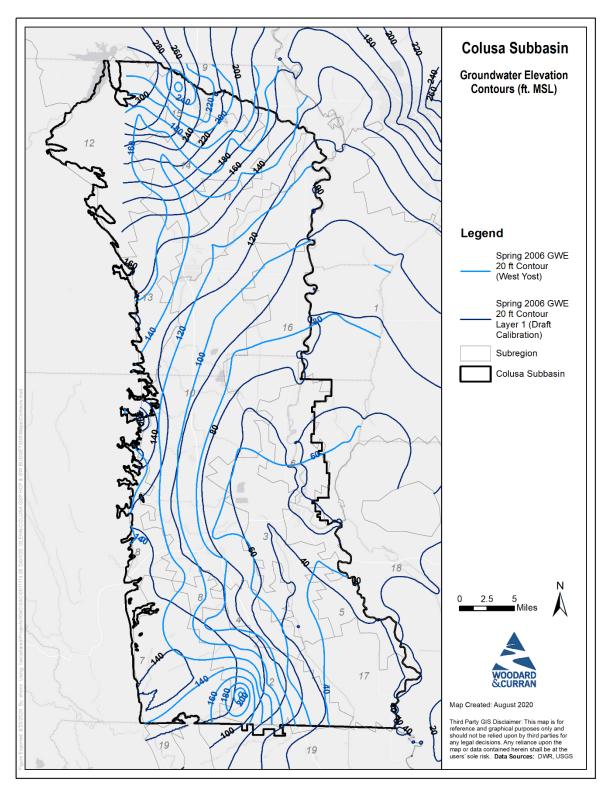


Figure 18: Spring 2006 Groundwater Elevation Contours Comparison



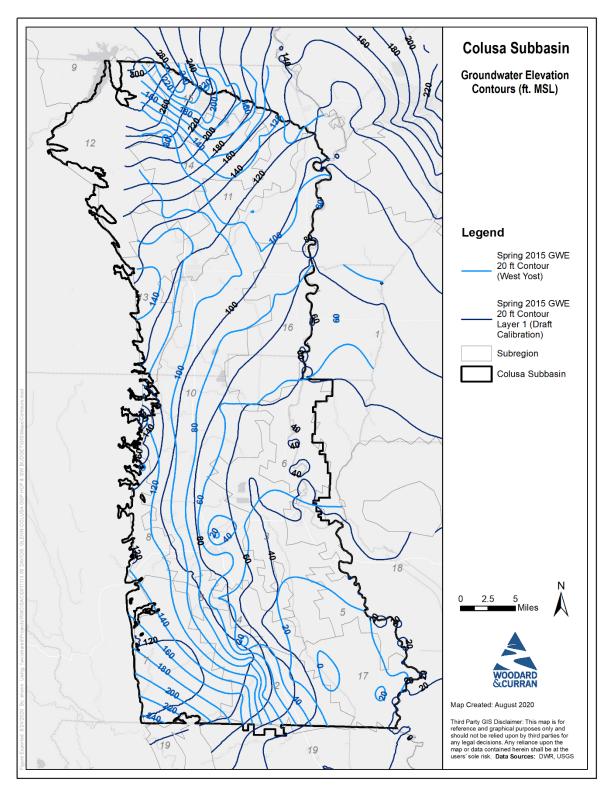


Figure 19: Spring 2015 Groundwater Elevation Contours Comparison



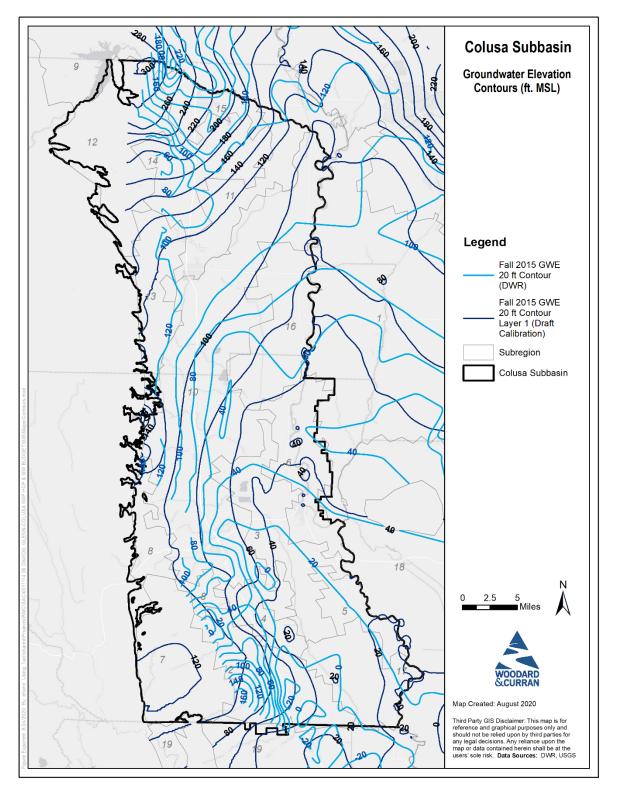


Figure 20: Fall 2015 Groundwater Elevation Contours Comparison



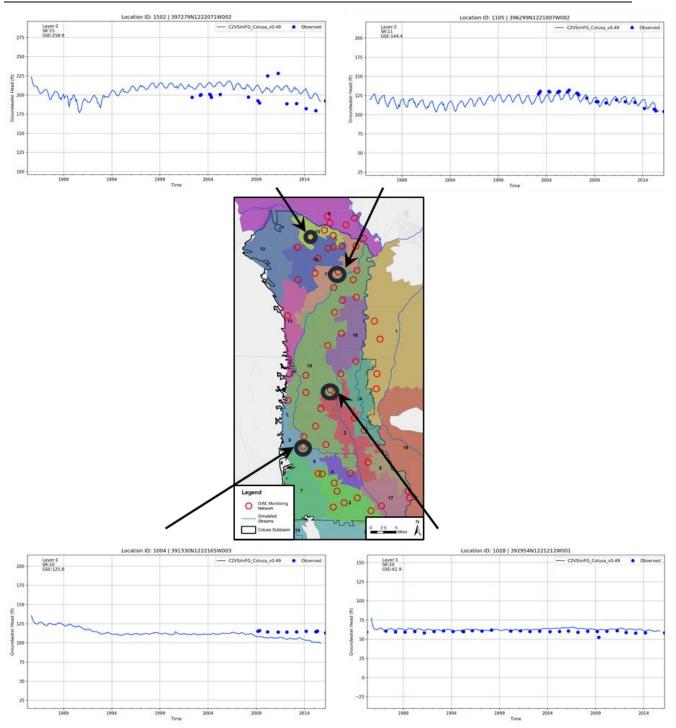


Figure 21: Selection of Groundwater Calibration Well Hydrographs



4. AQUIFER PARAMETERS AND DATA

C2VSimFG-Colusa uses a parametric grid that has been developed based on C2VSim Fine Grid (C2VSimCG) nodes and elements. The parametric grid nodes are spaced approximately 3.5 miles apart. Aquifer parameters are assigned to each parametric node and interpolated to the nearby C2VSimFG-Colusa groundwater nodes. Figure 22 shows the parametric grid nodes used to calibrate Colusa Subbasin. After regional calibration using the parametric grid, local calibration was made by changing aquifer parameters at each C2VSimFG-Colusa model node.

The initial aquifer parameters were from C2VSimFG Beta2 model. Through analysis of subregion water budgets and groundwater level hydrographs at the calibration wells, aquifer parameters were adjusted either model-wide or by node in particular areas. The parameters resulting from the calibration process are listed in Table 4-1.

Layer	Horizontal Hydraulic Conductivity (ft/day)	Specific Storage (1/ft)	Specific Yield (-)	Aquifer Vertical Hydraulic Conductivity (ft/day)
1	1 - 218	1.00E-05 – 1.00E-04	0.06 - 0.11	0.02 – 0.69
2	2 - 215	1.00E-05 – 1.00E-04	0.06 - 0.11	0.02 – 0.67
3	2 - 127	9.00E-6 - 1.00E-04	0.06 - 0.11	0.02 – 0.48
4	5 - 49	1.00E-05 – 1.00E-04	0.06 - 0.11	0.14 – 1.05

Table 4-1: Range of Calibrated Aquifer Parameter Values

The horizontal hydraulic conductivity in the C2VSimFG-Colusa varies across the horizontal direction and across model layers. The fully calibrated values for model layers 1 through 4 range from 1 ft/day to 218 ft/day, and the spatial distribution is represented in Figure 23 through Figure 26.

The aquifer vertical hydraulic conductivity facilitates the separation between the unconfined and confined aquifers within the C2VSimFG-Colusa and controls the flow of groundwater between the materials making up the different modeled aquifer layers. Analysis of the groundwater levels in each layer for calibration wells (i.e., nested calibration wells spanning multiple layers) determined that greater separation between layers was needed in some areas and resulted in a range of 0.02 ft/day to 1.05 ft/day across the model layers.



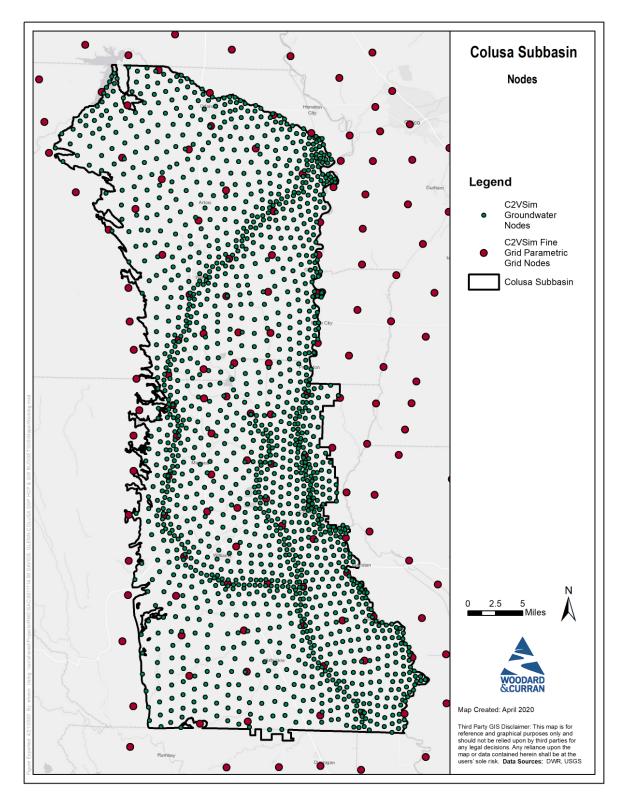


Figure 22: Parametric Grid Nodes within Colusa Subbasin and Five-Mile Buffer Area



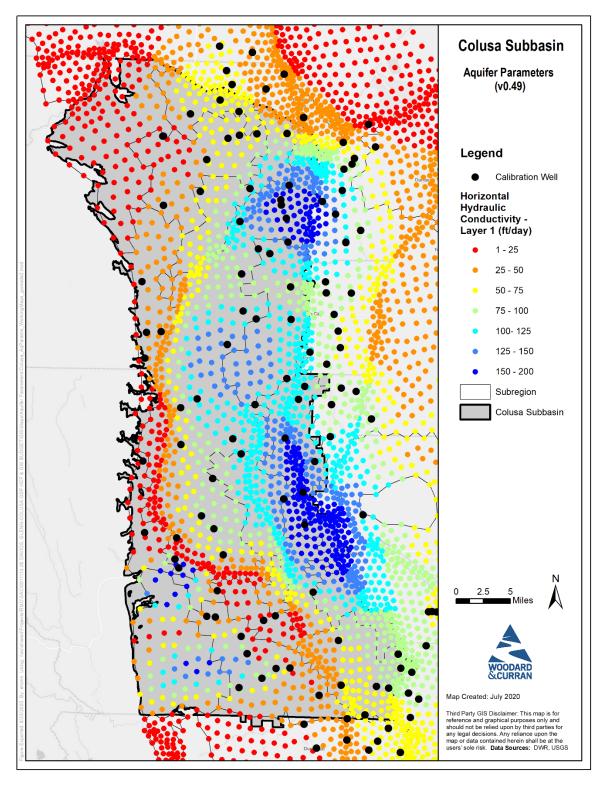


Figure 23: Calibrated Layer 1 Horizontal Hydraulic Conductivity (ft/day)



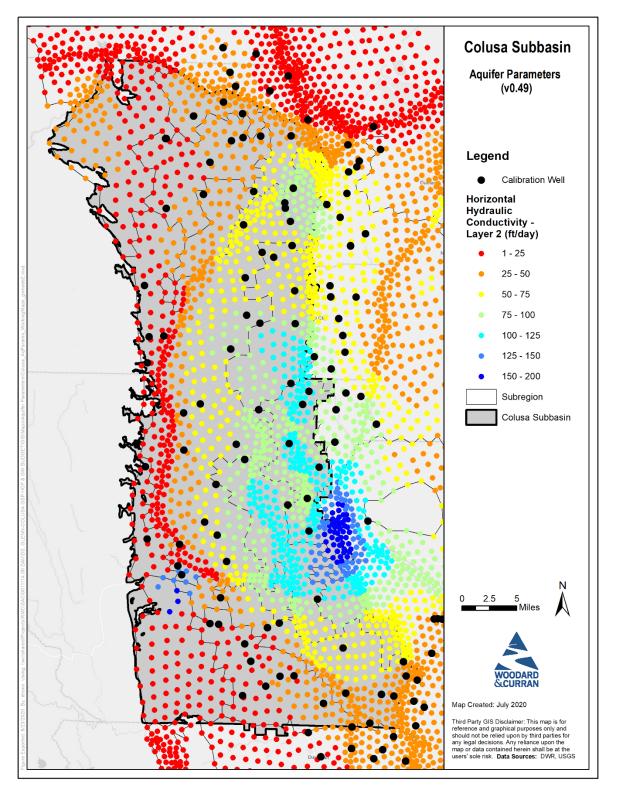


Figure 24: Calibrated Layer 2 Horizontal Hydraulic Conductivity (ft/day)



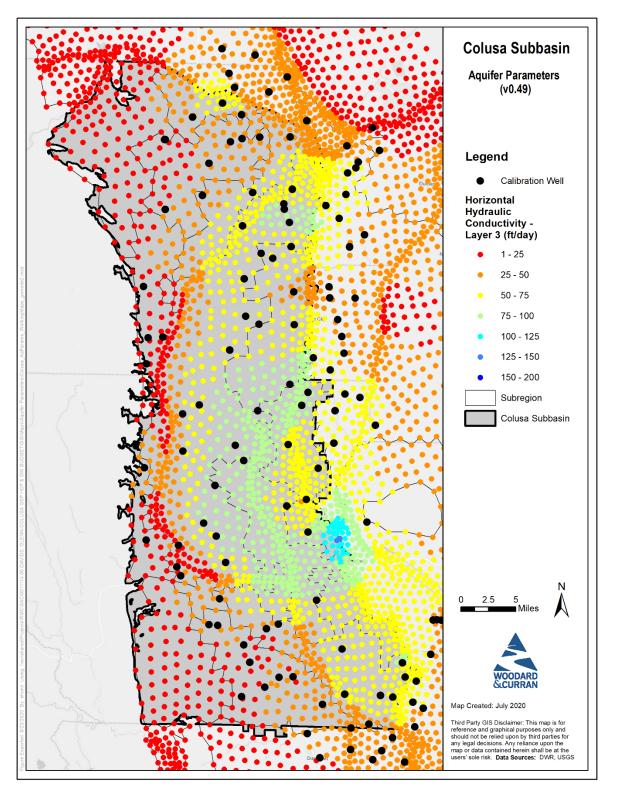


Figure 25: Calibrated Layer 3 Horizontal Hydraulic Conductivity (ft/day)



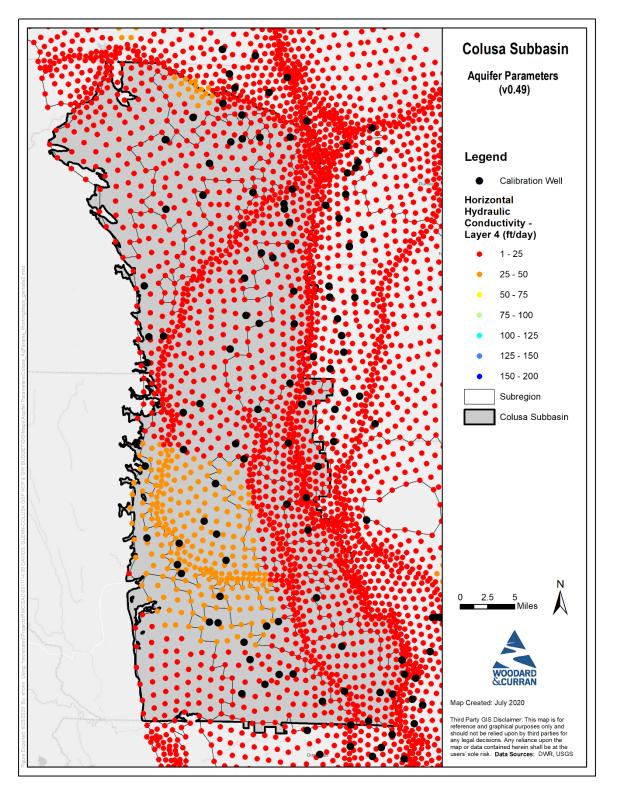


Figure 26: Calibrated Layer 4 Horizontal Hydraulic Conductivity (ft/day)



5. CALIBRATION TARGETS AND STATISTICS

The C2VSim-Colusa simulated groundwater levels were evaluated to meet the American Standard Testing Method (ASTM) standards. The "Standard Guide for Calibrating a Groundwater Flow Model Application" (ASTM D5981) states that "the acceptable residual should be a small fraction of the head difference between the highest and lowest heads across the site." The residual is defined as the simulated head minus the observed head. An analysis of all observed groundwater levels within the model area indicated the presence of 250+ feet of groundwater level changes in Colusa basin. Assuming 10 percent as the small fraction, the acceptable residual level would be about 25 feet. Calibration goals for the groundwater level residuals were set such that no more than 10 percent of the observed groundwater levels would exceed the acceptable residual level of 25 feet.

- 69% of observed groundwater levels are within +/- 10 feet of its respective simulated values
- 81% of observed groundwater levels are within +/- 15 feet of its respective simulated values
- 92% of observed groundwater levels are within +/- 25 feet of its respective simulated values

The residual histogram for the monitoring wells selected to be part of the calibration dataset for C2VSimFG-Colusa is shown in Figure 27. Additionally, a scatter plot of simulated versus observed values is shown in Figure 28.

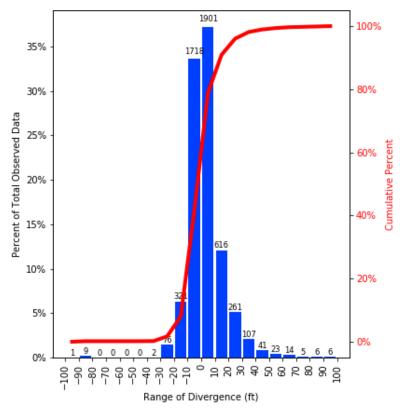


Figure 27: Residual Histogram of C2VSimFG-Colusa Note: Observed water levels only for Spring (March-May) WY 1986-2015



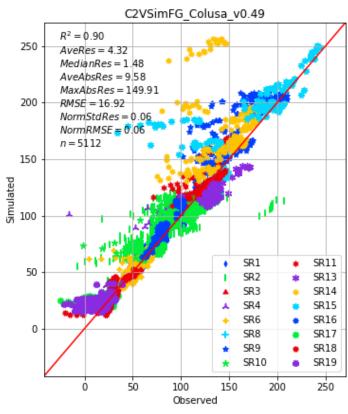


Figure 28: Scatter Plot of C2VSimFG-Colusa

Note: Statistics calculated using only observed water levels for Spring (March-May) WY 1986-2015

6. SENSITIVITY ANALYSIS

Sensitivity analysis is an important step in the model development process. It is defined as "the study of distribution of dependent variables (e.g., groundwater elevations in a groundwater model) in response to changes in the distribution of independent variables, initial conditions, boundary conditions, and physical parameters" (AWWA, 2001). In general, a sensitivity analysis of an integrated groundwater and surface water model is performed for the following purposes:

- To test the robustness and stability of the model by establishing tolerance within which the model parameters can vary without significantly changing the model results;
- To understand the impact of inaccuracies in input data on model results (e.g., how model results can change because of a 10% error in the estimation of agricultural pumping); and
- To develop an understanding of the relative sensitivity of the components of the hydrologic cycle and data, so that an effective data collection and monitoring plan can be developed.

A sensitivity analysis was performed using the C2VSimFG-Colusa to assess the sensitivity of model results to specific model parameters. Adjustments of aquifer parameters, and analyses of the resulting calibration well residuals, was performed across all calibration wells for various model runs. Analysis performed on parameters indicated that the model was fairly sensitive to horizontal hydraulic conductivity, specific yield, and less sensitive to the other parameters (Figure 29).



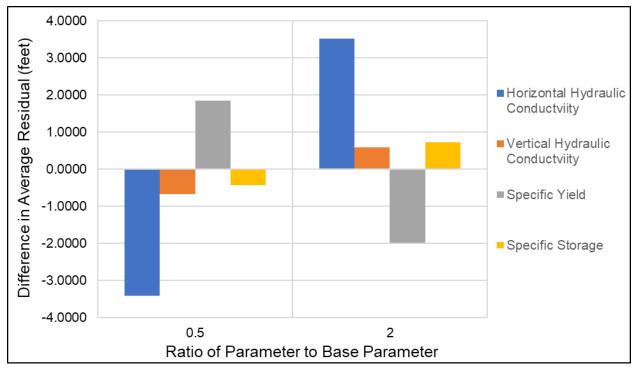


Figure 29: Difference in Calibration Well Residuals due to Changes in Aquifer Parameters

7. HISTORICAL WATER BUDGET RESULTS

Following all refinements, enhancements, and calibration procedures described in this technical memorandum, the C2VSimFG-Colusa model was used to quantify the historical water budget for the Colusa Subbasin. The historical water budget provides a foundation for understanding how the Subbasin has behaved historically, as well as insight into historical groundwater conditions (e.g. observed water levels) and insight into the sustainability of past groundwater management. In accordance with the GSP Regulations, the historical water budget covers a period of at least ten years (26-year period from 1990 to 2015).

A summary of the historical water budget results are presented below for the Subbasin land and surface water system (SWS), and for the Subbasin groundwater system (GWS). Additional information and discussion of the historical water budget is provided in the GSP, including an evaluation of the availability and reliability of historical surface water supplies per the GSP regulations. It is anticipated that the water budgets will be refined and updated over time as part of GSP implementation in the basin.

7.1 Historical Water Budget: Land and Surface Water System

Average annual inflows and outflows to and from the Colusa Subbasin land and surface water system were estimated to be nearly 13.83 million acre-feet (MAF) per year. Average annual values are shown in Figure 30 and Table 7-1.

Primary inflows to the land and SWS include surface water inflows (11,747 TAF/yr), precipitation (1,210 TAF/yr), groundwater pumping (502 TAF/yr), and stream gains from groundwater (i.e., stream accretions) (366 TAF/yr). Surface water inflows predominantly enter the Colusa Subbasin along the Sacramento River, where the river is wholly contained within the subbasin, flowing into the Subbasin south of the town of Princeton and out near of the City of Colusa. Additional surface water inflows occur through diversions from outside the Subbasin to land within the Subbasin (1,168 TAF/yr), and through overland runoff of precipitation from upslope small watersheds to the Subbasin (78 TAF/yr).



Primary outflows from the land and SWS include surface water outflows (11,302 TAF/yr), evapotranspiration (1,740 TAF/yr), deep percolation from land surfaces and small watersheds (441 TAF/yr), and seepage from streams, canals, and drains (345 TAF/yr). Surface water outflows include outflows along the Sacramento River, outflows to Sutter Bypass at Colusa Weir, drainage from the Colusa Basin Drain, overland runoff of precipitation and applied water to downslope lands, and other outflows to boundary streams. Evapotranspiration is primarily from agricultural lands, but also from managed wetlands, canal evaporation, native vegetation, and urban and industrial lands.

The average annual change in SWS storage is negligible compared to other inflows and outflows due to similar soil moisture content in the root zone, on average, across water years.

Figure 31 and Table 7-2 summarize the applied water computed by the C2VSimFG-Colusa model for the historical water budget period, according to the data sources and refinements describe in this technical memorandum. The total applied water includes surface water deliveries and groundwater pumping applied to all water use sectors in the Colusa Subbasin (agricultural, managed wetlands, and urban and industrial lands). Total surface water deliveries are computed based on the refined diversions data described above, averaging just over 1,260 TAF/yr (approximately 72 percent of the total applied water). Total groundwater pumping averages just over 500 TAF/yr (approximately 28 percent of the total applied water).

Figure 32 and Table 7-3 summarize the total groundwater recharge from the surface water system in the Colusa Subbasin. More than half of all groundwater recharge comes from deep percolation of applied water and precipitation on land surfaces, averaging 439 TAF/yr over the 1990-2015 historical water budget period (56 percent of total groundwater recharge). Other major contributors to groundwater recharge are stream seepage, and canal seepage. Stream seepage averaged 206 TAF/yr in 1990-2015 (26 percent of total groundwater recharge), while canal seepage averaged 139 TAF/yr over the same period (18 percent of total groundwater recharge). Percolation of runoff from small watersheds has contributed another 2 TAF/yr (less than one percent of total groundwater recharge).

Additional details describing the historical land and surface water system water budget are provided in the Colusa Subbasin GSP Appendix A.



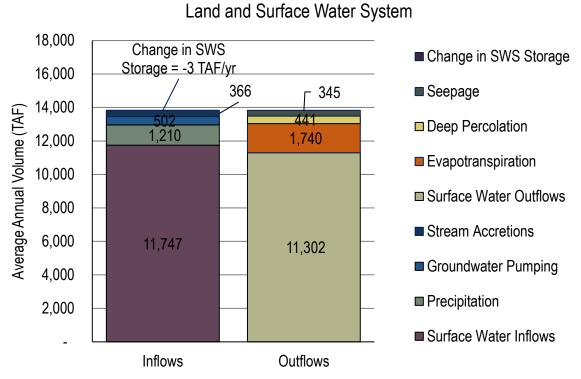


Figure 30: Historical Water Budget: Land and Surface Water System Summary.

Land and Surface Water System Flow Direction	Water Budget Component	Average Volume (TAF per year, 1990-2015) ¹
	Surface Water Inflows	11,747
Inflows	Precipitation	1,210
IIIIOw5	Groundwater Pumping	502
	Stream Accretions	366
Total Inflows		13,825
	Surface Water Outflows	11,302
Outflows	Evapotranspiration	1,740
Outhows	Deep Percolation ²	441
	Seepage ³	345
Total Outflows		13,828
Change in SWS Storage (Int	-3	

¹Volumes rounded to 1,000 AF.

²Deep percolation includes deep percolation of applied water, deep percolation of precipitation, and small watershed percolation.

³ Seepage includes stream, canal, and drain seepage to groundwater.



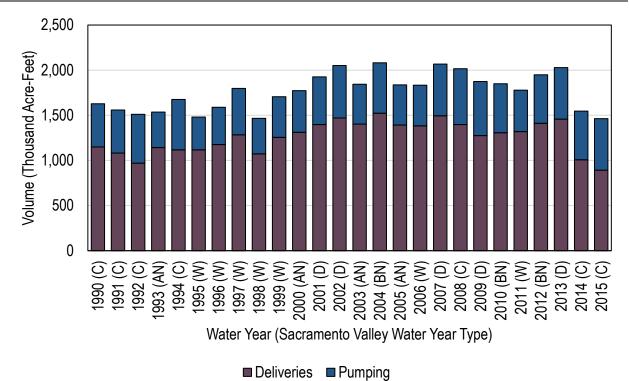


Figure 31. Historical Water Budget: Applied Water in All Water Use Sectors.

Year Type	Number of Years	Surface Water Deliveries	Groundwater Pumping	Total Applied Water
W	7	1,230	435	1,664
AN	4	1,313	435	1,748
BN	3	1,414	546	1,960
D	5	1,419	570	1,990
С	7	1,088	540	1,628
Annual Average (1990-2015)	26	1,262	502	1,764

Table 7-2. Historical Water Budget: Average Annual Applied Water	er in All Water Use Sectors
(TAF/yr, rounded).	



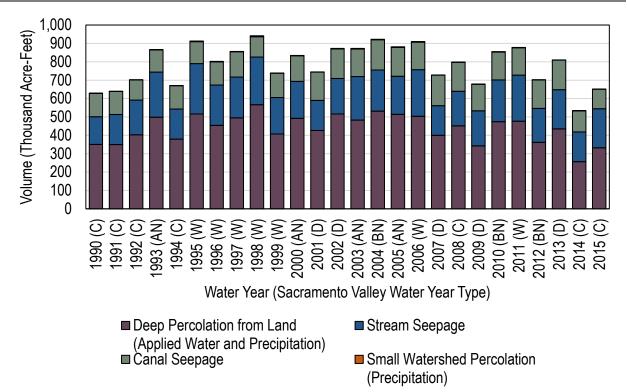


Figure 32. Historical Water Budget: Groundwater Recharge from the Land and Surface Water System.

		Deep Perc	olation	Seepa			
	Number	Deep Percolation from Land	Small Watershed Percolation	•	Canal and	Total	
Year Type	Number of Years	(From Applied Water and Precipitation)	(From Precipitation)	Stream Seepage	Drain Seepage	Groundwater Recharge	
W	7	489	3	239	132	863	
AN	4	497	3	222	142	864	
BN	3	456	2	212	157	827	
D	5	424	1	184	158	767	
С	7	360	1	175	124	661	
Annual Average (1990-2015)	26	439	2	206	139	786	

Table 7-3. Historical Water Budget: Average Annual Groundwater Recharge from the
Land and Surface Water System (TAF/yr, rounded).



7.2 Historical Water Budget: Groundwater System

Average annual inflows and outflows to and from the Colusa Subbasin groundwater system are shown in Figure 33 and Table 7-4.

Primary inflows to the GWS include deep percolation from land surfaces and small watersheds (441 TAF/yr), seepage from streams, canals, and drains (345 TAF/yr), and subsurface inflows from adjacent subbasins (200 TAF/yr).

Primary outflows from the GWS include groundwater pumping (502 TAF/yr), stream gains from groundwater (i.e., stream accretions) (366 TAF/yr), and subsurface outflows to adjacent subbasins (146 TAF/yr). On average, subsurface outflows of groundwater from the Colusa Subbasin exceed subsurface gains of groundwater to the Colusa Subbasin.

The average annual change in storage is -28 TAF/yr over the 1990-2015 historical water budget period. This indicates that on average more groundwater leaves the Colusa Subbasin than enters, resulting in an average net reduction in groundwater stored in the Subbasin. The majority of groundwater inflows and outflows are exchanged directly with the land and SWS overlying the Colusa Subbasin GWS. Figure 34 summarizes the annual change in storage and the cumulative change in storage in the Colusa Subbasin GWS over the historical water budget period.

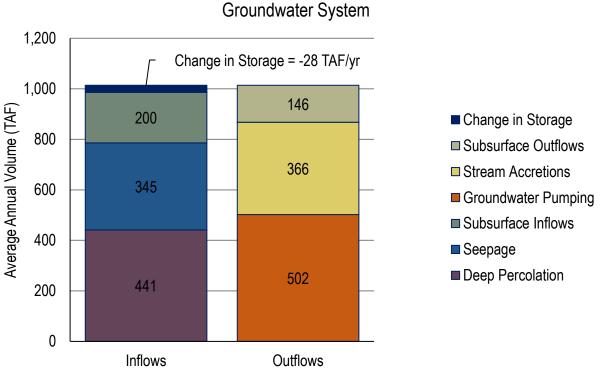


Figure 33. Historical Water Budget: Groundwater System Summary.



Groundwater System Flow Direction	Water Budget Component	Average Volume (TAF per year, 1990-2015) ¹
	Deep Percolation ²	441
Inflows	Seepage ³	345
	Subsurface Inflows	200
Total Inflows		986
	Groundwater Pumping	502
Outflows	Stream Accretions	366
	Subsurface Outflows	146
Total Outflows		1,014
Change in Storage (Inflows – C	-28	

Table 7-4. Historical Water Budget: Groundwater System Summary.

¹Volumes rounded to 1,000 AF.

²Deep percolation includes deep percolation of applied water, deep percolation of precipitation, and small watershed percolation.

³ Seepage includes stream, canal, and drain seepage to groundwater.

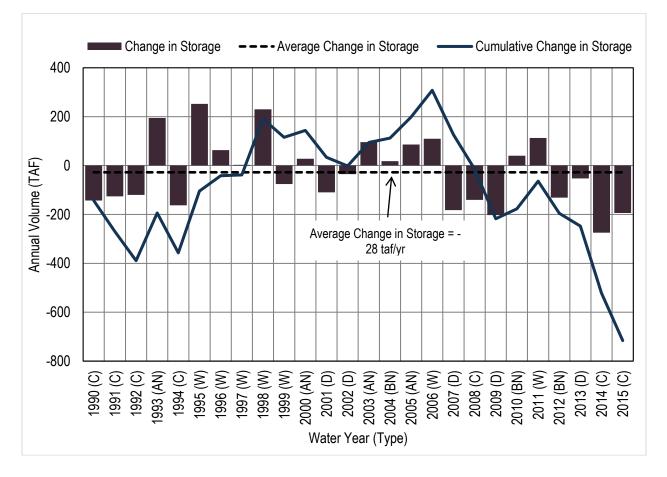


Figure 34. Historical Water Budget: Groundwater System Change in Storage.



8. SUMMARY AND FUTURE REFINEMENTS

The C2VSimFG-Colusa model is a well-calibrated regional integrated surface water and groundwater model that can be used effectively to analyze surface and groundwater conditions of the Colusa Subbasin. This model could be used adequately for evaluation of effectiveness and impacts of groundwater sustainability projects and management actions that are being developed as part of Groundwater Sustainability Plan (GSP) of the Colusa Basin.

C2VSimFG-Colusa model was developed based on DWR's C2VSimFG model for the entire Central Valley of California for a simulation period ending in 2015. The simulation period and model grid resolution and layers thicknesses of C2VSimFG were not changed in development of C2VSimFG-Colusa model. However, many local features and data such as land use and surface water delivery were updated for C2VSimFG-Colusa model. During development and calibration of C2VSimFG-Colusa model, several potential refinements were identified to may be included in future refinements to the model. These refinements may include:

- Extension of time series data past WY 2015. With the calibrated model, extending time series data (e.g., precipitation, land use, stream inflows, evapotranspiration, surface water diversions, urban demand, groundwater pumping) allows for use of more recent data and improved accuracy of the model for predicting near-term and future conditions in the Colusa groundwater subbasin.
- **Model layering**. Model layer thicknesses may be adjusted locally, primarily in the southwest and northwest areas of the model, to better represent local geologic conditions and potential faults in these areas.
- **Distribution of groundwater pumping between layers**. Model layer thicknesses may be refined such that distribution of groundwater pumping between model layers better matches groundwater extraction from different depth and layers of the aquifer.
- **Small watersheds**. The water coming from the foothills is simulated using small watersheds representing small streams and groundwater flowing into the western side of the Colusa Subbasin. These streams, mostly ephemeral, may need explicit representation and simulation in the model to better control recharge and flows from the foothills as some observed groundwater levels near the foothills show signs of recharge from nearby small streams.
- Interbasin flows. C2VSimFG-Colusa model is well calibrated along the eastern boundary of the basin and the five mile zone on the eastern side of this boundary. Quantification of Sacramento River recharge along the eastern boundary of the basin and subsurface groundwater underflow across this boundary into and out of Colusa, Butte and Vina basins will be useful in building consensus for management of groundwater by these neighboring basins.
- **Model Grid Resolution**. The observed groundwater level data show high spatial gradients in the northwestern and southwestern areas of the model. Model grid may be refined in these areas the simulate these local high groundwater gradients.

Appendix 3E

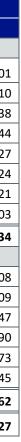
Historical Land and Surface Water System and Groundwater System Water Budget Tables

			Table	3E-1. Historic	al Land and S	Surface Wate	er System Wa	ter Budget, 1	990 to 2015						
								Water Year							
Component	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Inflows															
Surface Water Inflows	7,165,843	6,480,396	6,638,674	13,269,887	7,403,760	21,507,109	14,925,862	15,746,226	23,329,324	13,920,996	14,179,083	8,831,837	10,162,491	13,742,120	14,325,951
Sacramento River Diversions	948,727	906,494	778,191	944,228	909,497	928,149	956,283	1,056,121	869,476	1,026,817	1,087,640	1,187,367	1,273,544	1,227,916	1,339,952
Stony Creek Diversions	89,430	89,720	94,900	75,480	104,470	80,060	102,250	107,340	67,870	100,940	106,440	109,350	113,110	89,230	108,420
Sacramento River Inflows	6,127,101	5,479,158	5,751,094	12,047,054	6,388,496	20,129,890	13,753,954	14,504,523	21,939,530	12,771,626	12,960,893	7,523,186	8,735,913	12,366,220	12,739,067
Other Inflows from Boundary Streams	586	5,024	14,489	203,124	1,296	369,010	113,374	78,242	452,448	21,614	24,110	11,934	39,923	58,754	138,512
Precipitation	698,765	900,162	1,120,879	1,786,232	903,912	2,276,873	1,491,532	1,355,938	2,393,636	902,086	1,163,312	988,061	1,084,757	1,355,424	1,220,093
Groundwater Pumping	477,946	476,926	539,945	393,531	557,477	362,526	412,959	514,321	392,869	450,073	461,713	528,115	581,766	440,968	558,363
Agricultural	443,714	441,621	505,894	361,336	526,586	331,856	378,951	476,909	357,502	410,484	418,967	484,785	539,579	398,241	515,509
Urban and Industrial	10,509	10,735	10,937	11,089	11,176	10,857	11,110	11,990	10,746	11,298	11,669	11,865	12,472	11,929	12,595
Managed Wetlands	23,724	24,570	23,114	21,107	19,715	19,813	22,899	25,422	24,620	28,291	31,078	31,465	29,716	30,798	30,259
Stream Gains from Groundwater	361,161	354,935	347,708	343,103	355,723	359,645	379,803	395,484	361,854	411,989	387,686	371,536	369,766	372,060	380,934
Total Inflow	8,703,715	8,212,418	8,647,205	15,792,752	9,220,871	24,506,153	17,210,156	18,011,969	26,477,683	15,685,145	16,191,795	10,719,549	12,198,781	15,910,572	16,485,341
Outflows															
Evapotranspiration	1,527,370	1,388,793	1,583,422	1,728,551	1,719,160	1,757,267	1,820,537	1,785,625	1,786,811	1,706,457	1,750,242	1,784,406	1,846,841	1,823,814	1,827,447
Agricultural	1,253,469	1,133,017	1,292,701	1,400,523	1,443,352	1,392,355	1,478,506	1,476,205	1,403,955	1,393,683	1,418,631	1,475,575	1,545,150	1,471,263	1,518,646
Urban and Industrial	16,796	16,488	17,738	17,449	16,812	19,873	18,514	18,719	21,316	19,827	21,212	19,741	17,686	21,793	17,932
Managed Wetlands	62,674	61,572	66,424	64,007	65,743	66,237	69,608	72,079	66,671	69,072	72,037	73,192	72,105	71,719	71,716
Native Vegetation	162,752	149,345	179,713	205,457	162,898	223,475	207,845	178,466	243,316	181,080	196,357	179,776	172,362	214,889	176,787
Canal Evaporation	31,679	28,372	26,847	41,115	30,355	55,328	46,064	40,157	51,554	42,796	42,006	36,122	39,538	44,151	42,366
Deep Percolation	350,785	350,448	403,716	501,067	379,765	519,628	457,292	497,153	571,681	408,780	494,897	427,772	517,682	486,386	534,833
Precipitation	134,061	130,465	170,086	260,064	150,969	278,224	218,722	200,022	310,164	159,467	188,007	145,891	170,567	192,840	179,280
Applied Surface Water	170,639	170,325	165,857	190,658	160,535	190,348	188,144	210,973	196,951	192,463	237,227	207,134	246,916	224,756	248,871
Applied Groundwater	46,085	49,658	67,774	50,346	68,260	51,056	50,426	86,158	64,566	56,851	69,663	74,746	100,199	68,791	106,682
Seepage	278,205	288,475	298,944	365,713	291,164	393,464	345,235	359,579	369,690	330,459	339,951	317,544	354,901	386,403	387,772
Streams	150,491	163,726	188,655	245,683	163,591	274,236	219,097	221,979	258,661	198,235	200,565	163,569	193,730	236,497	223,251
Canals and Drains	127,714	124,750	110,289	120,030	127,573	119,228	126,137	137,599	111,029	132,223	139,386	153,975	161,171	149,907	164,522
Surface Water Outflows	6,593,251	6,192,374	6,360,123	13,179,569	6,832,019	21,825,252	14,593,753	15,376,079	23,732,489	13,263,299	13,607,533	8,183,129	9,490,644	13,204,231	13,758,653
Precipitation Runoff	10,514	35,646	44,364	96,399	22,224	157,681	74,871	63,816	162,238	21,185	43,209	31,299	42,307	60,220	64,944
Operational Flows															
Applied Surface Water Return Flows	84,636	78,432	89,516	96,491	95,355	88,803	87,315	99,220	85,955	77,708	63,117	109,639	115,427	115,703	112,832
Applied Groundwater Return Flows	15,570	15,201	25,324	17,518	24,286	15,303	16,350	26,167	18,634	16,121	15,465	24,543	29,002	21,496	27,342
Sacramento River	6,028,803	5,410,632	5,640,834	10,820,783	6,284,591	14,951,836	11,958,688	11,592,836	16,314,482	11,973,231	10,756,896	7,325,174	8,293,239	11,435,929	11,115,273
Colusa Basin Drain	386,120	581,381	487,448	1,073,186	338,719	1,607,475	782,840	768,777	1,710,498	462,043	616,529	540,685	638,769	760,664	917,570
Colusa Weir to Sutter Bypass	0	0	30,620	1,064,648	0	4,993,091	1,626,437	2,760,115	5,415,790	642,359	2,039,886	63,710	299,549	767,629	1,461,327
Other Outflows to Boundary Streams ¹	67,608	71,081	42,017	10,544	66,844	11,064	47,252	65,147	24,890	70,652	72,431	88,079	72,350	42,590	59,365
Total Outflow	8,749,612	8,220,091	8,646,205	15,774,900	9,222,107	24,495,611	17,216,816	18,018,436	26,460,672	15,708,995	16,192,624	10,712,851	12,210,068	15,900,835	16,508,705
Change in Storage (Inflow - Outflow)	-45,896	-7,673	1,000	17,853	-1,236	10,542	-6,660	-6,467	17,012	-23,850	-829	6,698	-11,287	9,737	-23,364

	Table 3E-1.	Historical Lar	nd and Surfac	e Water Syst	em Water Bu	idget, 1990 to	o 2015, conti	nued			
						Water Year					
Component	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Inflows											
Surface Water Inflows	11,282,360	21,203,001	8,618,376	8,726,414	7,941,916	9,989,848	14,098,828	8,895,178	9,405,821	6,371,986	7,246,109
Sacramento River Diversions	1,248,729	1,222,261	1,324,904	1,223,655	1,106,723	1,146,353	1,165,323	1,252,911	1,296,136	850,042	702,073
Stony Creek Diversions	81,370	91,470	108,640	105,890	85,070	80,810	82,290	89,780	92,690	61,890	80,960
Sacramento River Inflows	9,829,151	19,666,083	7,182,835	7,386,917	6,749,337	8,705,010	12,773,588	7,550,495	8,010,692	5,459,493	6,459,857
Other Inflows from Boundary Streams	123,110	223,188	1,997	9,952	786	57,675	77,627	1,991	6,302	562	3,218
Precipitation	1,483,465	1,642,203	645,613	969,805	783,935	1,322,534	1,465,349	955,291	977,763	637,076	944,535
Groundwater Pumping	444,103	450,016	570,999	618,395	599,386	541,689	458,941	536,599	571,120	539,253	570,709
Agricultural	403,994	408,824	527,573	575,392	557,980	501,889	425,013	497,334	530,508	493,760	526,047
Urban and Industrial	12,536	12,443	13,018	12,667	11,935	10,244	9,359	9,992	10,812	9,145	7,590
Managed Wetlands	27,573	28,748	30,409	30,335	29,471	29,556	24,568	29,273	29,799	36,349	37,073
Stream Gains from Groundwater	386,026	383,206	390,025	368,814	338,378	329,322	357,795	358,015	349,361	336,765	352,745
Total Inflow	13,595,954	23,678,426	10,225,013	10,683,427	9,663,615	12,183,393	16,380,912	10,745,083	11,304,065	7,885,081	9,114,097
Outflows											
Evapotranspiration	1,870,571	1,878,738	1,750,765	1,780,707	1,825,272	1,838,050	1,814,196	1,821,305	1,803,856	1,513,007	1,500,657
Agricultural	1,489,390	1,493,575	1,492,126	1,516,539	1,547,275	1,507,320	1,453,183	1,521,011	1,536,256	1,276,516	1,249,376
Urban and Industrial	26,912	25,524	20,704	18,998	24,498	28,127	31,556	28,852	24,394	26,655	25,312
Managed Wetlands	69,637	69,417	71,594	70,516	71,421	65,833	67,160	68,069	68,878	70,190	69,616
Native Vegetation	241,160	232,476	127,254	140,010	146,082	197,695	211,958	162,235	135,865	112,849	130,948
Canal Evaporation	43,474	57,747	39,086	34,644	35,997	39,076	50,339	41,139	38,463	26,796	25,406
Deep Percolation	517,541	508,252	401,504	453,314	343,083	476,647	479,125	362,434	436,345	257,294	333,010
Precipitation	228,652	228,717	97,824	128,709	101,788	178,340	206,544	125,171	134,224	75,275	121,738
Applied Surface Water	206,796	200,859	218,858	222,677	169,184	198,939	191,397	166,391	217,662	140,443	156,844
Applied Groundwater	82,093	78,676	84,821	101,927	72,111	99,368	81,184	70,872	84,460	41,576	54,427
Seepage	364,172	402,427	326,985	345,389	335,742	378,617	399,343	339,860	374,027	276,350	318,924
Streams	207,009	253,379	160,723	187,991	190,554	227,109	250,219	184,695	212,971	161,670	212,321
Canals and Drains	157,163	149,048	166,261	157,398	145,188	151,508	149,124	155,165	161,055	114,680	106,603
Surface Water Outflows	10,834,750	20,888,786	7,748,339	8,113,030	7,150,369	9,490,116	13,691,869	8,227,428	8,690,801	5,846,430	6,973,708
Precipitation Runoff	57,353	86,926	14,660	47,435	25,853	58,030	73,104	32,650	37,344	14,289	42,567
Operational Flows											
Applied Surface Water Return Flows	122,940	102,929	107,309	99,013	87,828	96,549	114,461	108,089	115,325	72,033	68,864
Applied Groundwater Return Flows	26,265	21,551	25,164	26,776	22,546	26,676	25,146	22,744	25,248	14,661	15,233
Sacramento River	9,475,296	16,130,331	7,061,947	7,235,060	6,592,032	8,439,756	11,807,110	7,439,600	7,806,198	5,385,429	6,371,539
Colusa Basin Drain	851,470	1,148,448	428,152	601,460	332,745	704,199	829,571	557,333	576,354	295,562	440,304
Colusa Weir to Sutter Bypass	227,880	3,357,104	13,940	29,370	30,870	124,790	810,079	0	78,420	0	0
Other Outflows to Boundary Streams ¹	73,548	41,497	97,167	73,916	58,495	40,117	32,400	67,011	51,912	64,456	35,202
Total Outflow	13,587,035	23,678,202	10,227,592	10,692,440	9,654,467	12,183,430	16,384,534	10,751,028	11,305,029	7,893,081	9,126,299
Change in Storage (Inflow - Outflow)	8,920	224	-2,580	-9,013	9,149	-37	-3,622	-5,945	-964	-7,999	-12,202

Table 3E-2. Historical Groundwater System Water Budget, 1990 to 2015															
	Water Year														
Component	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Inflows															
Subsurface Water Inflows	201,406	200,087	199,599	198,729	206,109	199,167	192,310	200,117	188,933	191,711	193,979	194,506	198,449	192,506	199,804
Deep Percolation	350,785	350,448	403,716	501,067	379,765	519,628	457,292	497,153	571,681	408,780	494,897	427,772	517,682	486,386	534,833
Precipitation	134,061	130,465	170,086	260,064	150,969	278,224	218,722	200,022	310,164	159,467	188,007	145,891	170,567	192,840	179,280
Applied Surface Water	170,639	170,325	165,857	190,658	160,535	190,348	188,144	210,973	196,951	192,463	237,227	207,134	246,916	224,756	248,871
Applied Groundwater	46,085	49,658	67,774	50,346	68,260	51,056	50,426	86,158	64,566	56,851	69,663	74,746	100,199	68,791	106,682
Seepage	278,205	288,475	298,944	365,713	291,164	393,464	345,235	359,579	369,690	330,459	339,951	317,544	354,901	386,403	387,772
Streams	150,491	163,726	188,655	245,683	163,591	274,236	219,097	221,979	258,661	198,235	200,565	163,569	193,730	236,497	223,251
Canals and Drains	127,714	124,750	110,289	120,030	127,573	119,228	126,137	137,599	111,029	132,223	139,386	153,975	161,171	149,907	164,522
Total Inflow	830,396	839,010	902,259	1,065,509	877,037	1,112,258	994,836	1,056,849	1,130,304	930,950	1,028,828	939,822	1,071,033	1,065,296	1,122,409
Outflows		·													
Subsurface Water Outflows	134,554	132,989	134,397	133,887	126,746	137,942	139,170	143,789	145,751	144,457	151,840	149,682	154,730	156,308	165,200
Groundwater Pumping	477,946	476,926	539 <i>,</i> 945	393,531	557,477	362,526	412,959	514,321	392,869	450,073	461,713	528,115	581,766	440,968	558,363
Agricultural	443,714	441,621	505 <i>,</i> 894	361,336	526,586	331,856	378,951	476,909	357,502	410,484	418,967	484,785	539,579	398,241	515,509
Urban and Industrial	10,509	10,735	10,937	11,089	11,176	10,857	11,110	11,990	10,746	11,298	11,669	11,865	12,472	11,929	12,595
Managed Wetlands	23,724	24,570	23,114	21,107	19,715	19,813	22,899	25,422	24,620	28,291	31,078	31,465	29,716	30,798	30,259
Stream Gains from Groundwater	361,161	354,935	347,708	343,103	355,723	359,645	379,803	395,484	361,854	411,989	387,686	371,536	369,766	372,060	380,934
Total Outflow	973,662	964,849	1,022,049	870,521	1,039,945	860,114	931,933	1,053,594	900,474	1,006,520	1,001,240	1,049,333	1,106,262	969,336	1,104,496
Change in Storage (Inflow - Outflow)	-143,265	-125,839	-119,790	194,988	-162,908	252,145	62,903	3,255	229,830	-75,570	27,588	-109,511	-35,229	95,961	17,913

Table 3E-2. Historical Groundwater System Water Budget, 1990 to 2015, continued											
						Water Year					
Component	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Inflows		-									
Subsurface Water Inflows	194,420	196,864	204,638	205,946	207,844	207,110	201,677	203,767	206,758	206,595	212,601
Deep Percolation	517,541	508,252	401,504	453,314	343,083	476,647	479,125	362,434	436,345	257,294	333,010
Precipitation	228,652	228,717	97,824	128,709	101,788	178,340	206,544	125,171	134,224	75,275	121,738
Applied Surface Water	206,796	200,859	218,858	222,677	169,184	198,939	191,397	166,391	217,662	140,443	156,844
Applied Groundwater	82,093	78,676	84,821	101,927	72,111	99,368	81,184	70,872	84,460	41,576	54,427
Seepage	364,172	402,427	326,985	345,389	335,742	378,617	399,343	339,860	374,027	276,350	318,924
Streams	207,009	253,379	160,723	187,991	190,554	227,109	250,219	184,695	212,971	161,670	212,321
Canals and Drains	157,163	149,048	166,261	157,398	145,188	151,508	149,124	155,165	161,055	114,680	106,603
Total Inflow	1,076,133	1,107,542	933,127	1,004,649	886,668	1,062,374	1,080,146	906,061	1,017,130	740,239	864,534
Outflows					·						
Subsurface Water Outflows	159,987	164,844	154,252	158,165	151,491	150,938	150,444	142,515	149,252	138,604	134,908
Groundwater Pumping	444,103	450,016	570,999	618,395	599,386	541,689	458,941	536,599	571,120	539,253	570,709
Agricultural	403,994	408,824	527,573	575,392	557,980	501,889	425,013	497,334	530,508	493,760	526,047
Urban and Industrial	12,536	12,443	13,018	12,667	11,935	10,244	9,359	9,992	10,812	9,145	7,590
Managed Wetlands	27,573	28,748	30,409	30,335	29,471	29,556	24,568	29,273	29,799	36,349	37,073
Stream Gains from Groundwater	386,026	383,206	390,025	368,814	338,378	329,322	357,795	358,015	349,361	336,765	352,745
Total Outflow	990,116	998,065	1,115,276	1,145,374	1,089,255	1,021,949	967,180	1,037,129	1,069,733	1,014,623	1,058,362
Change in Storage (Inflow - Outflow)	86,017	109,477	-182,149	-140,725	-202,586	40,425	112,966	-131,068	-52,603	-274,384	-193,827



Appendix 4A

Well Completion Reports for Groundwater Monitoring Network Wells

6

FEET

of .

LCB-4

1

SHEET _

HOLE NO. LOI ELEV. 25 (topo)

DRI	LL	HO	LE	LOG

		DUIL	L HOLE LOG	DEPTH	1020	FEET
PROJECT	Lower Colusa Basin	n Conjuncti	ive Use	DATE DRILLED.	6/24-6/25/97	
FEATURE	Exploratory Boring			ATTITUDE	Vertical	
LOCATION _	12N/01E-06D*			LOGGED BY	F. Nasirian	
CONTR	Eaton Drilling Co.	DRILL RIG	Ingersoll-Rand	DEPTH TO WAT	Not Deter	minec
001111			TH-400			

* Near the south east corner of the intersection of County Line Road and the Colusa Basin Drain

DEPTH	LOG	FIELD CLASSIFICATION AND DESCRIPTION	SAMPLE NO.	MODE	REMARKS
0.0	CL	Holocene/Pleistocene Sediments 0.0-1020'			Drilled mostly with clear water, at times bentonite
20.0	GC	0.0-10.0' <u>Clay (CL</u>): Brown, medium plasticity, moist. 10.0-20.0' <u>Clayey Gravel (GC)</u> : Brown, about 5-10% clay, fine to medium, gravel wet.			was added. The drill rods were 2-1/2" in
1111	SP	20.0-40.0' <u>Sand (SP</u>): Gray, less than 5% fines, fine to coarse grained sand.	1111		diameter with a 4" collar at both ends.
40.0		40.0-70.0' <u>Clay (CL)</u> : Brown, about 5-10% fine gravel, about 5-10% sand, moist			The collars would not allow any cuttings larger than 1/2 -3/4" size to come to the surface.
60.0	CL	o-To to hine gravel, about o-To to saird, moist			Soils and geologic contacts were determined from logging the drill cuttings recovered from the shaker.
		70.0-245.0' Clay (CH): Bluish-brown, high plasticity, moist.	1111		
80.0					
00.0	сн				
20.0					
to the second					
40.0		140.0-160.0' Clay with about 10-15% fine to coarse grained sand.			
160.0					

DWR 885 (1) (Rev. 9-84)

SHEET 2 OF 6

HOLE NO. LCB-4

DEPTH (ELEV.) 160.0	LOG	FIELD CLASSIFICATION AND DESCRIPTION	SAMPLE NO.	MODE	REMARKS
180.0	CH	Holocene/Pleistocene Sediments 0.0-1020.0' (cont'd)			
200.0		190.0-205.0' Bluish-gray, high plasticity. 205.0-230.0' Bluish-green, high plasticity.			
220.0	СН	230240.0' About 10-15% sand and fine			
240.0		gravel. 245.0-280.0' <u>Gravel (GP)</u> : Gray, less than 5% fines, about 10-15% fine to coarse grained sand, mostly fine gravel.			
260.0	GP				
280.0		280.0-320.0' <u>Gravely Clay g(CL)</u> : Grayish-brown, 15-20% sand, 20-25% fine to medium gravel.			
300.0	g(CL)	300.0-310.0' Reddish brown	1111111		
320.0	SP	320.0-330.0' <u>Sand (SP)</u> : Gray, fine to medium grained sand, about 5-10% fines. 330.0-355.0' <u>Gravel (GP)</u> : Gray, about 5-10% sand, fine to coarse grained gravel.			
340.0	GP/ GW				
+	SP	355.0-360.0' Sand (SP): Gray, fine to medium grained.			

DWR 885 (2) (Rev. 9-84)

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SHEET 3 OF 6

HOLE NO. LCB-4

ELEV.)	LOG	FIELD CLASSIFICATION AND DESCRIPTION	SAMPLE NO.	MODE	REMARKS
60.0	u.	Holocene/Pleistocene Sediments 0.0-1020.0' (cont'd)			
80.01 1111111111	СН	360.0-395.0' <u>Clay (CH)</u> : Reddish-brown, high plasticity.			Added bentonite to the mud.
20.0	GP	395.0-515.0' <u>Poorly Graded Gravel (GP)</u> : Gray, about 10-15% fine to coarse sand grained, up to ½" in diameter.			
20.6			lititi		
40.0	GP		-11.		
160.0		460.0-480.0' <u>Clayey Gravel (GC)</u> : About 10-15% clay.			
	GC	10-1076 diay.			
80.0	GP	480.0-515.0' Mostly fine gravel.	1		
00.0					
	GP				
20.0	ML	515.0-530.0' Silt with about 5-10% fine gravel.			
40.0	GC	530.0-720.0' <u>Clayey Gravel (GC)</u> : Gray, about 15-25% fines, mostly fine gravel.	1		

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SHEET 4 OF 6

HOLE NO. ______

Holocene/Pleistocene Sediments 0.0-1020.0' (cont'd) 600.0-620.0' Mostly fine to coarse grained sand.		
600.0-620.0' Mostly fine to coarse grained sand.		
650.0-680.0' About 40-50% sand and gravel.		
700.0-720.0' About 10-15% fines, gravel up to 3/4" in diameter.		
gravel.		
	gravel. 700.0-720.0' About 10-15% fines, gravel up to 3/4" in diameter. 720.0-1,000.0' <u>Sandy Clay s(CL)</u> : Gray about 15-25% fine to medium grain sand, less than 5% fine	gravel. 700.0-720.0' About 10-15% fines, gravel up to 3/4" in diameter. 720.0-1,000.0' <u>Sandy Clay s(CL)</u> : Gray about 15-25% fine to medium grain sand, less than 5% fine gravel.

PROJECT & FEATURE Lower Colusa Basin Conjunctive Use

DWR 885 (2) (Rev. 9-84)

SHEET 5_OF 6

HOLE NO. _____CB-4

DEPTH (ELEV.)	LOG	FIELD CLASSIFICATION AND DESCRIPTION	NO. MODE	REMARKS
760.0	s(CL)	Holocene/Pleistocene Sediments 0.0-1020.0' (cont'd)		
80.0		780.0-800.0' Mostly lean clay less than 5% sand.		
	CL			
00.0				
820.0		810.0-820.0' About 25-30% sand, fine to medium grained.	1111	
1111	s(CL)			
840.0				
		•		
B60.0		860.0-900.0' About 35-40% sand mostly fine to medium grained.		
880.0				
900.0	s(CL)	900.0-940.0' About 30-40% sand, mostly fine to medium grained.	1	
920.0				
بتليب				
940.0		940.0-960.0' Mostly clay with almost no sand.	1	
	CL			

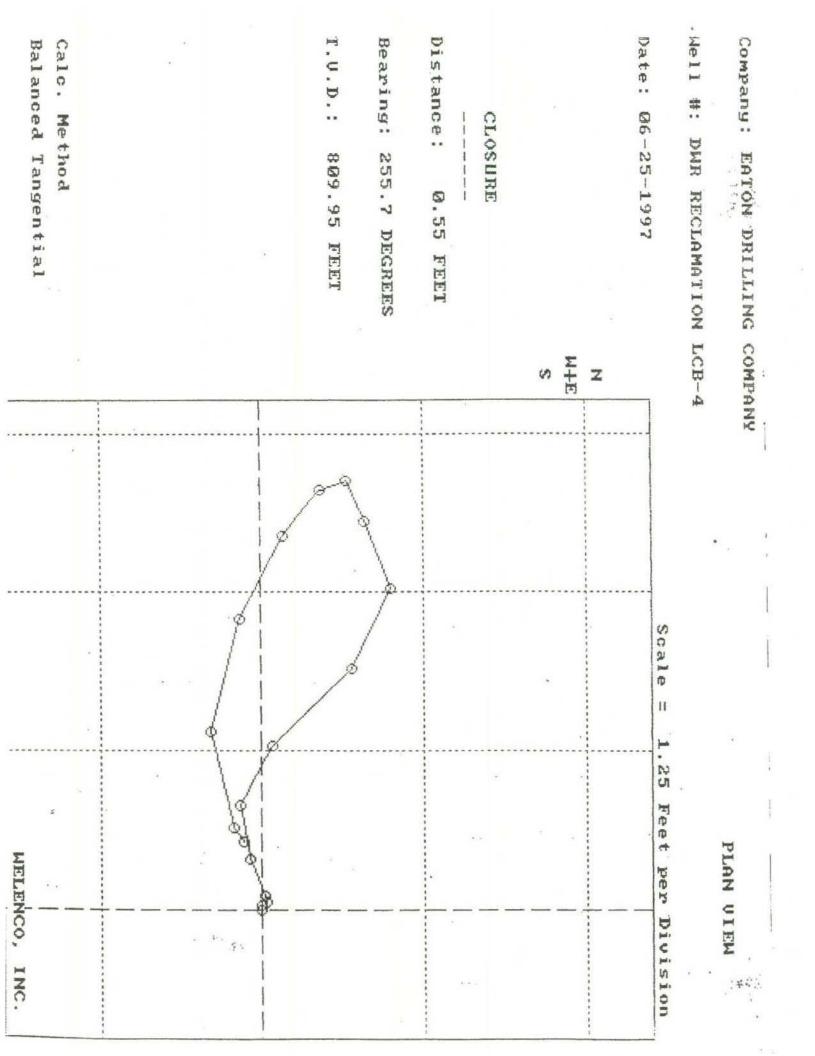
DWR 885 (2) (Rev. 9-84)

SHEET 6 OF 6

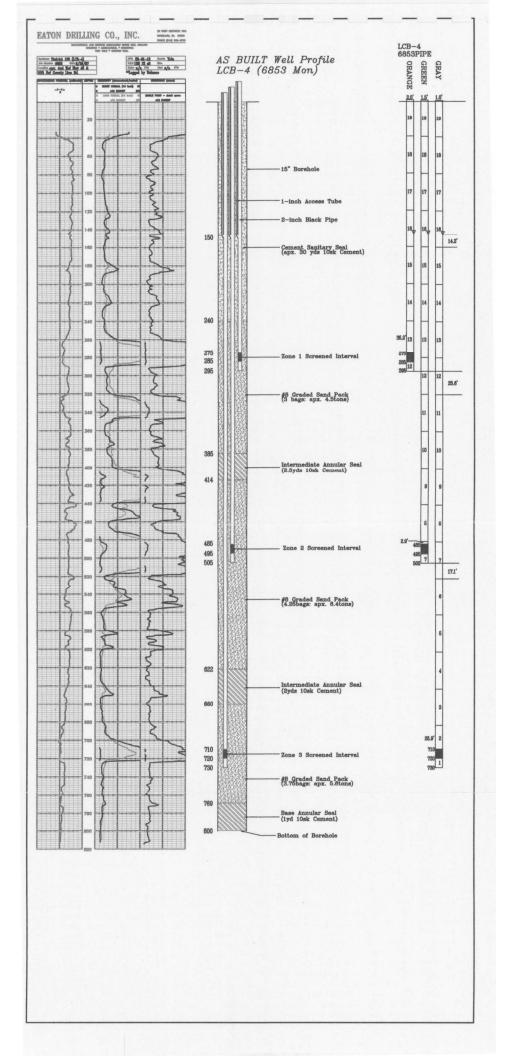
HOLE NO. _____

TH V.)	LOG	FIELD CLASSIFICATION AND DESCRIPTION	SAMPLE NO.	MODE	REMARKS
0	145	Holocene/Pleistocene Sediments 0.0-1020.0' (cont'd)			
0	s(CL)	980.0-1020.0' Mostly clay with some sandy clay chips.			
.0		Hole bottomed @ 1020.0'			
				-	
			11111		
111111					
			1		
liiik			1 1 1 1		
-					

9	PLANE OF CLOSURE	. 0	ROTATED 90 DEGREES	
WIDN DRILLING COMPANY WILL #: WR RECLAMATION LCB-4	•			: : : : : : : :
hate: 06-25-1997				
		. 2 <u>4</u> 0		: : : : : : :
UERTICAL SECTION		320.		: : : : : : : :
Jert Scale = 80 Ft/Div		400	-	
CLOSURE				: : : : : : : :
Distance: 0.55 FEET				: : : : : : : : :
255.7 DE 809.95 F		640 		5.
		720		: : : : : :
		800		** •• •• <u>•</u> • •
Calc. Method:		• • •		• • • •
n Thomas				



>>>> Welenco, Inc.>>>> DIRECTIONAL SURVEY Date: 06-25-1997 : EATON DRILLING COMPANY Company Well No : DWR RECLAMATION LCB-4 Field : DUNNIGAN State County: YOLO : CALIFORNIA Witnessed By: SMITH Rec. By: ROBERTI Location : COLUSA BASIN DRAIN & COUNTY LINE RD. Remarks : OTHER SERVICES: ELOG Measured Incli-Direc-Course True Closure Closure Depth, nation. tion, Deviation, Vertical Distance, Bearing, Feet Degrees Feet Depth, Feet Degrees Degrees True Feet True 0 0.0 0.00 0.00 0.00 0.0 0 50 0.0 210 0.00 50.00 0.00 32.0 100 0.1 0.04 100.00 0.04 268 268.0 150 0.1 0.07 298.0 30 0.09 150.00 0.13 200 0.2 236 200.00 0.12 281.6 250 0.5 0.31 0.41 257.9 254 250.00 0.5 300 0.44 300.00 0.84 259.2 267 0.8 1.29 273.7 350 0.57 316 349.99 400 1.2 0.87 399.99 2.02 290.4 315 450 0.6 253 0.79 449.98 2.71 291.6 500 0.7 246 0.57 499.98 3.15 284.7 550 0.35 3.43 281.1 0.1 257 549.97 278.1 600 0.5 0.26 599.97 3.33 148 273.5 650 0.6 0.48 649.97 2.95 113 0.74 2.29 700 699.96 1.1 121 265.8 750 0.96 749.95 1.45 254.7 1.1 86 800 0.7 64 0.79 799.95 0.68 251.6 810 0.9 48 0.14 809.95 0.55 255.7 Equip.: L-16 Office: BFL Job No.: 28403 Calculation Method: Balanced Tangential *******************************



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				2	FIELD DUNNIGAN	
	>				WELL DUR RECLAMATION LCB-4	6853
			Dat Too		COMPANY EATON DRILLING COMPANY	FILING NO.
			8		I	
		esi ol	Pos		LCB-4 ELECTRIC LOG	LC
			0			
		_	the 18	~		
		-				
			Hol			

	FORM 115		100 the	2465			
	INVEST	IGATION	DIVISION OF WATER RESOL	-	R. NUMBER		SHEET I
	· · · · · · · · · · · · · · · · · · ·		STATE OF CALIFORNIA		DESIGNAT	23	4+#-
				ate Drilled N		1011	
		1500' S. 1	200' W. of N. E. corner	<u> </u>		ine	Co.
	Co	lusa Co.,	Sacto. Valley Dist., Kirkville G	Juad.			-/
	OWNER				SKETCH		
	DATE COMPLETE	:D			GAIRIS		
	DIAMETER OF C	ABING 14"	hole 8" csg Type Rotary	l v	SNFIDEI Bier Sode	Sec 137	52
	DRILLED BY	Valley Dri	lling Co.				
	SOURCE OF INF	ORMATIOND	riller				
			SEE FILE NO.				
	SURFACE ELEVA		<u>. 158</u> ' Depth	 		<u></u>	
	DEPTH	ELEVATION OF BOTTOM OF STRATUM	MATERIAL	THICKN PEET		ABSOLUTE VOIDS FEET	TOTAL VOIDS FEET
	<u> </u>	22	Top soil & clay			+	
	27	136	Gravel and sand Clay				
\sim	136	158	Gravel			++	<u>-</u>
						1	
NES							
3							
4ATE							
ALTERNATE				्र			
		····					
E USE S							
COPIES							
ELD C	·						
<u>11</u>			Plotted and Coded			∤∤	
FOR	······	-	A Well 3N/1E -11H3	>		-	
			· · · · · · · · · · · · · · · · · · ·				
\sim	· · · · · · · · · · · · · · · · · · ·					·	
~ - 2			······································				
							<u> </u>

ORIGINAL File Original, Duplicate and Triplicate with the DIVISION OF WATER RESOURCES P. O. BOX 1079 SACRAMENTO B. CALIFORNIA WATER WELL DRILLERS R (Sections 7076, 7077, 7078, Water Code)	IER RESOURCES Do Not Fill In State Well No. 13/11W - 7
(1) Driller: Name Aulman and Aulman Address 1309 Westwood Way Woodland, Calif. License No. 109870 Classification C-57	(2) Proposed use or uses (cbeck): (3) Equipment used Domestic Municipal (cbeck): Irrigation Industrial Rotary Domestic and Test well Cable Irrigation Dug well Other
Owner: Name Address	(4) Type of work (check): New well ⊠ Reconditioning of well □ Deepening existing well □

(5) Well log:

Surf

17

Total depth of well <u>180</u> ft.

Depth From Ground Surface

Give details of formations penetrated, such as silt, peat, muck, sand, gravel, clay, shale, sand stone, hardpan, rock. Include size of gravel (diameter) and sand (fine, medium, coarse), color of material, structure (loose, packed, cemented, soft, hard, brittle).

<u>sco</u>			28	ft.	Soil and clay
8	,,,	"	31		Loose wedlu blue gravel
1	**	"	39	**	<u>Yellow a ndy clay</u>
9	,,	"	54	"	Dribble yellow soudy clay
1	,,	"		***	Tollow clay
ż	,,	"	78	,,	<u>Britble yellow scudy clay</u>
8	,,	"	<u>. 81</u>	••	Loose Che blue geavel
1	,,	"	84	,,	Vellow clay
[i.	,,	"	<u> 86 </u>	"	Loose fine blue gevol
6	,,	"	116_	"	Nellos clay
6	,,,	"	126	"	<u></u>
26	**	,,	1/13	,,	Yellow club
13	"	»	155	**	Brittle vollow sendy clay
5	,,	,,	165	33 ·	Loose redian blue grevel
5	33	,,	157	"	Tard anadalone formation
7	"	,,	177	"	Loose redium blue privel
7	,,	,,	180	**	Tellow cley
	,,	,,		**	
	,,	**		**	
	,,	,,		,,	
	"	"		,,	
	"	,,		,,	
	· ,,	»,		,,	Plotted and Coded
		,,		>>	As Well 13N / IW . 7680
		"		**	

If additional space is required, continue on DWR Form No. 246-Supplement, and attach to respective report copies.

(6) Casing left in LENGTH	DIAMETER	SINGLE, DOUBLE, WELDED,	LBS. PER FOOT OR	SEATING BELOW GROUND SURFACE, FT.
	FT.	INCHES	OTHER	GAGE OF CASING	GROUND SURFACE, FIL
	18 0	12	single	<u>3/16 inch</u>	180
				····	
		<u></u>			
			······································		
	Type and size of	f shoe or well ringlan	12.Welded joints-2 Yes 📋 No		-

REAL REPORT OF A PARTY OF A PARTY

RIGINAL File Original, Juplicate and Triplicate with the DIVISION OF WATER RESOURCES P. O. BOX 1079 SACRAMED

EN IFORN VIA

SHEET 2 1052 Do Not Fill In

WATER WELL DRILLERS REPORT (Sections 7076, 7077, 7078, Water Code)

Do Not Fill In State Well No. <u>1307</u> 144 Other Well No.

Region.....

Type of perforator	-8 + +	to LOU	ft.	Hole	size	lè" <u>x 3/16"</u> №	lo. o:	f hole:	s(⊻	per	<u> </u>
Perforated	دیا لا۔۔۔۔ <u>۔۔۔۔۔۔۔۔۔۔۔۔۔۔۔۔۔۔۔۔۔۔۔۔۔۔۔۔۔۔۔</u>	,,	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	.,	**		., .,	, ,,			
		·····		"	**			, ,,			
	i		**	,,	,,			,			
»» 		**	,,	,,	,,		,, ,				
		>>	**	"	,,		»» »	• ••			
				,,	,,			,			
				"	,,		»» »	, ,,			
		>>		"			", ,	, ,,			
**	**			,,	,,		,, ,	, ,,			
»»	,,	·····					•				

(8) Water levels:

Depth at which water first encountered	78	.ft.
Depth to water before perforating		.ft.
Depth to water after perforating		ft.
Note any change in wa	ater level while drilling	

(9) Well pumping test:

Date of test 6/7/51 By whom M. P. Wilson	•47
Depth to water when test started	ft
Depth to water when test started	
G.P.M. at beginning of test 550 G.P.M.	
Drandown from standing level 90	ft.
G.P.M. at completion of test 570 G.P.M.	
Duradaria et completion of test 03	ft.
T I C. AND ATTOTOTA () DOUTS	
Temperature of water	
Was gas present in water? 🗌 Yes 🔚 No	

(10) General:

,			
	Was well gravel packed?	<u>Vos</u> Size of rock 5/8 i	nchThickness of packinch
	Was a surface sanitary seal pro-	vided? None	
	Were any strata sealed against	pollution? 🗌 Yes 🖾 No If yes, attac	C.A.N.
	Strata sealed] Yes [No If yes, attach copy.	<u>CONSIDENTIAL</u> Section 7076.1, Mater Code
	m 1 1 1 1	Ver El No. If yes attach conv.	Land Toro. 1, Water Code
	If well abandoned, was it plug	ged and sealed?	
	Method of plugging and sealin	·g	
		by Simpson.	
(1)	Location: J by Johnso	n. W by Doherty (12)	Time of work:
,	North	Section No. 7	Work started date $\frac{5/31}{51}$ Completed date $\frac{6/8}{55}$. Date of this report $\frac{6}{9}/\frac{9}{51}$
	0	Township 13 N	Date of this report 77752
		Range	WELL DRILLER'S STATEMENT:
		Base & Meridian Show location of well in Sec-	This well was drilled under my jurisdiction and the
	x	tion, thus (\times)	report is true to the best of my knowledge and belief.
		Distances to section lines from	-
		well, (N) or S 2580 ft.	[Signed] Aulman
		and E)or W_1450 ft.	[SIGNED] Autor Automan Well Deiller
1		Show location of nearest	B)
/		known well, thus (O)	License No. 109870 Classification C-57
	1 MILE	Distance to nearest known well2000ft.	Dated June, 30, 1951 Inch 19.
			As Well 13N / IW - 7680
1914/61		RECEIVAL WATER POLLUTION CO.	AS VVEII

PROJECT	Lower Colusa Basin Conjunctive Use Invest.				
FEATURE	Test Hole for Multi-Head Peizometer				
LOCATION	White Rd.@ Colusa Basin Drainage Canal				

CONTRACTOR Eaton Drilling Company

Dwayne DRILLER

DRILL RIG Direct Rotary, Ingersoll-Rand TH-400

HOLE NUMBER	LCB-1	
DATE DRILLED	12/22 & 23 /98	_
LOGGED BY	Chuck Owens CRO	
ATTITUDE		
DEPTH TO WAT	ER Unknown (~ 3 ft)	_
HOLE DEPTH	1,000 ft	_
ELEVATION	~50 ft MSL	

DEPTH	USCS	FIELD CLASSIFICATION AND DESCRIPTION	SY	REMARKS
0	CL	03-103 GRAVELLY LEAN CLAY w/ SAND: Gray; gravel (>15%) is fine (4 mm); sand >15%	3	General:
20 -	GC	103-203 CLAYEY GRAVEL w/ SAND: Brown; sand is coarse to fine ≥15%).	5	Drill bit diameter = 6 1/433
20 -	CL	203-303 LEAN CLAY: Brown	3	 Drill rods 223 long, 2½3 dia. with 43 collars at both ends, so clasts >13 prevented
40 • 60	CL	30∋-65∋ <u>GRAVELLY LEAN CLAY w/ SAND</u> : Brown; gravel is fine, angular to sub-angular quartz w/ a few clasts to 11⁄≥э∋ sub-rounded volcanics; sand is coarse (>15%) → Probably thin interbeds	3	 from reaching surface Mud rotary method, so all cuttings are saturated and moisture content not noted. Log is based on cuttings sampled from shaker about
80 -	GP	65∋-80∋ <u>POORLY-GRADED GRAVEL</u> : Gray; most gravel (~90%) is fine, but a few 1∍∋ clasts, all is sub- angular to sub-rounded quartz & volcanics → <i>Minor Aquifer</i> (70∋-80∋ best)	15	every 10 ₃ , but sampling not consistent, plus lag-time error renders elevations of contacts inaccurate – more so with increasing depth.
100	GP- GC	803-1203 POORLY-GRADED GRAVEL w/CLAY: Brown; gravel is fine, sub-rounded to sub-angular (>5%)	5	USBR 5005 Unified Soil Classification System used Logging Problem:
120				The rotary drilling method mixes cuttings from thin beds together in a mud slurry with any sluffed materials, and the
140	GC	120 \Rightarrow -150 \Rightarrow CLAYEY GRAVEL: Brown \rightarrow Many thin, silty interbeds?		origination depth of samples from the shaker is uncertain due to irregular collection, lag time and manner cuttings are brought to the surface. Thus, thin beds are often not identifiable, contacts are incorrect or uncertain, and soil
160				classification is obstructed.

EPTH	USCS			
160	USCS	FIELD CLASSIFICATION and DESCRIPTION	SY	REMARKS
		1509-2609 LEAN CLAY: Brown;		
180		190-210: gray, but similar materials		
200	CL	\rightarrow Numerous thin, clay/silty interbeds	3	
			3	
220				
240				
260 -				
280	SP	260∍-290∍ <u>POORLY-GRADED SAND</u> : Brown; sand is coarse sub-angular to sub-rounded, mostly quartz; <5% clay/silt; <15% fine gravel → <u>Producing Zone</u> (270∍-290∍ best)	25	
300	GP	2903-3103 POORLY-GRADED GRAVEL w/ SAND: Brown; sand is coarse (~40%); gravel is fine (~55%), all is sub-rounded to sub-angular	15	
320		3109-4059 <u>LEAN CLAY w/ SAND & GRAVEL</u> : Brown; sand is coarse and gravel is fine (variable 5-30%), all is sub-rounded & sub-angular		
340	CL/ SC	→ Numerous interbeds 320э-355э: 30% fine gravel	5	
		3553-3753: ~50% coarse sand		
360	-			

 \square

roject 8	k Feature	: Lower Colusa Basin Conjunctive Use		Hole No. LCB-2
оертн 360	USCS	FIELD CLASSIFICATION and DESCRIPTION	SY	REMARKS
300		(continued)		
380	CL/ SC			
400		375-4053: ~15% fine gravel, sub-angular & sub-rounded		
420	GW	405э-425э <u>WELL-GRADED GRAVEL w/ SAND</u> : Brown; most gravel is fine, but all sizes up to ½ээ; sand is coarse (≥ 15% clay); <5% clay → <i>Good Producing Zone</i>	20	
440	SC	4253-4453 <u>SANDY CLAY</u> : Brown; sand is coarse (<5%); pebbles up to 133	5	
460	SP	445∋-470∋ <u>POORLY-GRADED GRAVEL w/ SAND</u> : Brown; gravel is fine; sand is coarse; <10%. → <i>Good Producing Zone</i>	20	
480	CL	4703-4903 <u>SANDY LEAN CLAY</u> : Brown; sand is coarse, sub-angular & sub-rounded; ~5% subrounded pebbles	3	
500	SC	4903-5103 <u>CLAYEY SAND w/ GRAVEL</u> : Brown; ~50% / 50% clay and sand/gravel	5	
520	SP	510 3 -525 3 <u>POORLY-GRADED SAND</u> : Brown; sand is coarse, sub-rounded to sub-angular; ~10-15% clay. \rightarrow <i>Minor Aquifer</i>	20	
540	SC	525∋-555∋ <u>SANDY LEAN CLAY w/ GRAVEL</u> : Brown; sand is coarse (30-50%); 5-15% fine gravel → Several sandy/clayey interbeds	5	
560				

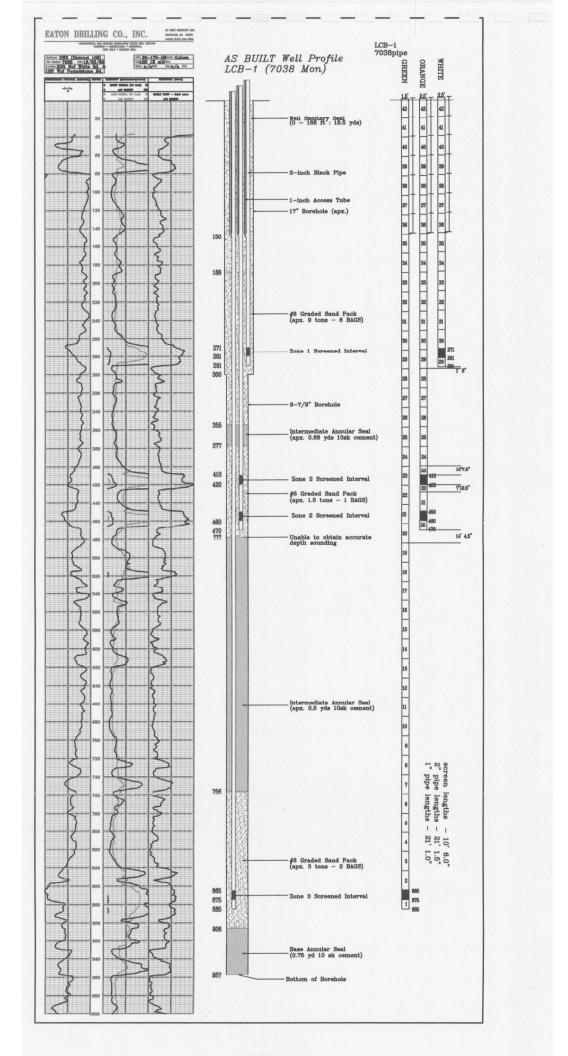
EPTH	USCS	FIELD CLASSIFICATION and DESCRIPTION	SY	REMARKS
560				
		5553-6053 GRAVELLY LEAN CLAY w/ SAND: Gray; gravel is fine/pebble size; sand is coarse (~15%)		
580	CL	→ several coarse/fine interbeds	5	
600				
	SC	6053-6203 SANDY LEAN CLAY w/ GRAVEL: Gray	10	
620 -		→ Poor/Minor Aquifer		
020		6203-7203: LEAN CLAY - Gray; coarse sand & pebbles		
		→ several clayey/coarse interbeds		
640		6253-6503: ~15-25% coarse sand		
		*		
660		6503-6603: ~10% fine gravel, well-graded to 1/2"		
	CL		3	
680				
000				
700		6903-7203: ~5-15% fine gravel & coarse sand		
720		7203-7303 CLAYEY SAND: Gray-brown; Sand is	10	
-	SC	coarse; <5% pebbles, all sub-angular and sub-rounded → Poor/Minor Aquifer		
740	CL	7309-7459 <u>SANDY CLAY</u> : Gray-brown; Sand is coarse; <5% pebbles, all sub-angular and sub-rounded	3	
-	SC	7453-7553 <u>CLAYEY SAND</u> : Gray-brown; Sand is coarse; <5% pebbles, all sub-angular and sub-rounded		
	30	→ Poor/Minor Aquifer	10	
760				

		: Lower Colusa Basin Conjunctive Use		Hole No. LCB-1
DEPTH	USCS	FIELD CLASSIFICATION and DESCRIPTION	SY	REMARKS
760		7553-8403 <u>SANDY LEAN CLAY</u> : Gray-brown; sand is coarse (~25%); <5% pebbles		
780				
800	CL	→ Numerous clayey/coarse interbeds	3	2
820				
840 -		8403-8953 <u>POORLY-GRADED SAND</u> : Gray; sand is coarse sub-angular (<75%); >5% pebbles		
860	SP	→ Producing Zone	25	
880		880-895>: ~15% pebbles; 5% clay (w/ 75% coarse sand)		
900	sw	8953-9303 <u>WELL-GRADED SAND</u> : Gray; sand is mostly coarse (~75%); ~5% pebbles; ~5% clay; other is medium sand	25	
920		→ <u>Producing Zone</u>		
940	CL	9303-9453 <u>SANDY LEAN CLAY</u> : Gray-brown; sand is coarse (~25%); <5% pebbles	3	
960		945∋-960∋ <u>POORLY-GRADED SAND</u> : Gray; sand is coarse sub-angular (<75%); >5% pebbles → <u>Aquifer</u>	25	U.

PTH	USCS	FIELD CLASSIFICATION and DESCRIPTION	SY	REMARKS
60	•	9603-10003 CLAYEY SAND: Gray-brown; sand is coarse, sub-angular (~75%); ~20% clay; ~5% pebbles		
80	SC		5	
000 -		T.D. (000		
		T.D. = 1,000∍		
		•		

				RECTIONAL SUN abular Listin			11	
	Measured Depth	Incli- nation	Direc- tion	Course Deviation	T.V. Depth	Distance	Bearing	
							and the second sec	
	Ø	0.0	241	0.00	0.00	0.00	0.0	日本這種對
	20	0.0	170	0.00	20.00	0.00	0.0	
	40	0.0	349	0.00	40.00	0.00	0.0	
	60	0.0	348	0.00	60.00	0.00	0.0	
	80	0.1	48	0.02	80.00	0.02	48.0	
	100	0.1	50	0.03	100.00	0.05	48.7	
	120	0.1	53	0.03	120.00	0.09	49,8	
72	140	0.1	50	0.03	140.00	0.12	50.3	
12	160	0.0	32	0.02	160.00	0.14	50.2	
	180	0.1	200	0.02	180.00	0.12	54.3	
	200	0.1	257	0.03	200.00	0.09	56.2	
	220	0.1	258	0.03	220.00	0.06	44.6	
	240	0.1	249	0.03	240.00	0.04	17.3	
	260	0.1	308	0.03	260.00	0.04	334.2	
	280	0.1	280	0.03	280.00	0.07	316.8	
	300	0.1	250	0.03	300.00	0.10	301.1	and a star
	320	0.1	242	0.03	320.00	0.12	287.4	
	340	0.2	284	0.05	340.00	0.17	282.5	41 T
	360	0.2	290	0.07	360.00	0.24	283.8	1998 - 1988 1997 - 1998
	380	0.0	34	0.03	380.00	0.27	284.6	
	400	0.0	36	0.00	400.00	0.27	284.6	
	420	0.0	45	0.00	420.00	0.27	284.6	· · · · · · · · · · · · · · · · · · ·
	440	0.4	280	0.07	440.00	0.34	283.7	
	460	0.1	246	0.09	460.00	0.43	281.6	
	480	0.4	263	0.09	480.00	0.51	278.0	
	.500	0.3	238	0.12	500.00	0.62	273.2	
	520	0.3	252	0.10	520.00	0.71	269.2	
	540	0.2	272	0.09	540.00	0.80	268.2	
	560	0.3	268	0.09	560.00	0.88	268.4	
	560	2.2		Q 29	580.00	3.07	268.9	
	600	3.2	223	0.07	600.00	1.03	267.9	
	622	0.1	ZBØ	0.05	620.00	1.07	266.0	
	640	Ø.Z	200	0.05	640.00	1.10	263.8	
	660	0.2	193	0.07	660.00	1.12	260.5	
	680	0.3	204	0.09	680.00	1.17	256.8	
	700	0.4	196	0.12	700,00	1.24	252.1	
	720	0.4	179	0.14	720.00	1.30	246.6	
	740	0.3	170	0.12	740.00	1.35	241.7	
	760	0.2	173	0.09	760.00	1.38	238.3	
	790	0.6	178	0.14	779.99	1.45	233.4	
	800	0.5	180	0.19	799.99	1.57	227.7	3
	820	0.7	155	0.21	819.99	1.68	221.5	to tak set
	840	0.7	158	0.24	839.99	1.79	214.4	a start
	860	0.5	135	0.21	859.99	1.89	208.7	- 1 N. 1 1
	880	0.6	140	0.19	879.99	1.96	203.4	a fill a late
	900	Ø.3	138	0.16	899.99	2.03	199.4	2 CC4
	920	0.9	125	0.21	919.99	2.11	194.0	A Constant
	940	1.0	133	0.33	939.98	2.27	186.4	·
	960	0.8	107	0.31	959.98	2.41	179.8	-10 A
	980	0.7	120	0.26	979.98	2.53	174.4	
	998	1.5	126	0.35	997.98	2.76	168.9	

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ORIGINAL

File Original, Duplicate and Triplicate with the **REGIONAL WATER POLLUTION**

(2) LOCATION OF WELL:

WATER WELL DRILLERS REPORT COND

(Sections 7076, 7077, 7078, Water Code)

STATE OF CALIFORNIA

Do Not Fill In No 40376 Skate Well No.

CONTROL BOARD No. 5 (Insert appropriate number)

Water Coue	State Well No.
	Other Well No

	(11) WELL	LOG:	
	Total depth	236 ft.	Depth of completed well
	Formation: Describe		r, size of material, and structu
	() ft. to	<u>20fr.</u>	Soil
=	20	112	Clay
	<u>112</u>	114	Bråttle
	<u> 114 </u>	7	Clay
-		122	Brittle Cla
		138	Gravel
		142	Clay
┶	<u> 142 </u>	157	Brittle San
	157	160	Brit. some
-	160	165	Fine Gravel
		177	Clay

	usa		's number, if a	ny		
R. F. D. or Street	[№] . Nea	r Sou	thwest	Cor	ner o	f
the Se	outheas		_		lthwe	
1/4 o:	f <u>Secti</u>	on 22	. Town	ship	13 N	orth.
Range	1 West	. M.	D. B.	& M.	and	
	just o				ad Ri	ght
	OF WOR			· · ·		
New well 🖾	Deepenin	ng 🔲	Recondit	ioning 🔲	A	bandon 🗌
If abandonmen	it, describe mate	erial and pro	ocedure in It	em 11.		
(4) PROP	OSED USI	E (check	k):	(5)	EQUIP	MENT:
Domestic [Irrigation []] Industria X Test Wel				ble	
		· · · ·		' Di	ig Well	
(6) CASI	NG INSTA	LLED:		If g	ravel pac	ked
(6) CASI		LLED:	Gage	•	-	
• •	DOUBLE 🗌	LLED: Diam.	Gage or Wall	If g	ravel pac from ft.	ted
SINGLE 😿 D	DOUBLE 🗌		or	Diameter of Bore	from	to ft.
SINGLE TO E		Diam.	or Wall	Diameter	from ft.	to
		Diam.	or Wall	Diameter of Bore	from ft. 0 ''	ft. 236 "
SINGLE X I		Diam. 12"	wall <u>3/16</u>	Diameter of Bore	from ft. 0 ''	£6. 236 "
	236	Diam. 12"	wall 3/16 	Diameter of Bore	from ft. 0 '' 	to ft. 236 "
	DOUBLE 236 	Diam. 12"	vall 3/16 	Diameter of Bore	from ft. 0 '' 	to ft. 236 " " "
	DOUBLE 236 	Diam. 12" Point		Diameter of Bore 22!! Size of grav	from ft. 0 '' 	**************************************

Factory Punched Type of perforator used Size 1-1/2" <u>3/16"</u> of perforations in., length, by io. From Rows per ft. ft. to ft. Perf. per row ... 196 236 4 24 •• •• • • ... •• 4 24 14 .. 11 11

(8) CONSTRUCTION:

Was a surface senitary seal provided? 🗌 Yes 🕱 No To what depth							
Were any strate	staled against pollutio	a) 🗌 Yes	No No	If yes, note depth of strata			
From	ít. to			ft.			
	н.			14			

Method of Sealing

(9) WATER LEVELS:

Depth at which water was first found	112 ft.
Standing level before perforating	45 ft.
standing level after perforating	45 ft.

None

(10) WELL TESTS:

Was a pump test made? Yield: 1950	gal./min. with	791	T.	H 61.	draw de	own after	8	hre.
Temperature of water	?	W 43 8	chemica	l analysi	s made?	🗌 Yei	K No	

ormation: Desci	ribe by color, char	acter, size of material, and structure.
<u>)</u> ft.	to 20f	Soil
20	112	Clay
112	<u> </u>	
114	117	Clay
117	122	Brittle Clay
122	138	Gravel
<u> 138 </u>	142	
142	157	
	160	Brit., some fine Grav.
_160	165	Fine_Gravel
165	177	
177	181	Brittle
<u> 181</u>	195	Sandy Brittle
105	232	Grevel
-232-	236	Clay
		· · · · · · · · · · · · · · · · · · ·
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	·······	· · · · · · · · · · · · · · · · · · ·
Well	Pumped	
		1200 " " 53 " "
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Work st		00	¹⁹ = 0	,	Соп
	Dec.	20	- 00		
WELL	DRILLER'S STA'	ГЕМЕ	NT:		

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Completed

NAME	Aulman & A	Aulman		
Address	1309 Westv	vood Way	(Typed or printed)	
	Woodland,		.a.	
[SIGNED]	XEau	Imac	>	
License N	109870	Well Driller Dated &	1/56	9
95689 3	-54 50M QUIN 🖲 SPO	DY	VR FORM NO. 240 (RE	¥. 3.84

LOCATION NOT CHECKER

230 ft.

19 56

Dec.

31

13N-2w-2

ORI	GINA	L
File	with	DWR

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STATE OF CALIFORNIA /3// THE RESOURCES AGENCY DEPARTMENT OF WATER RESOURCES WATER WELL DRILLERS REPORT

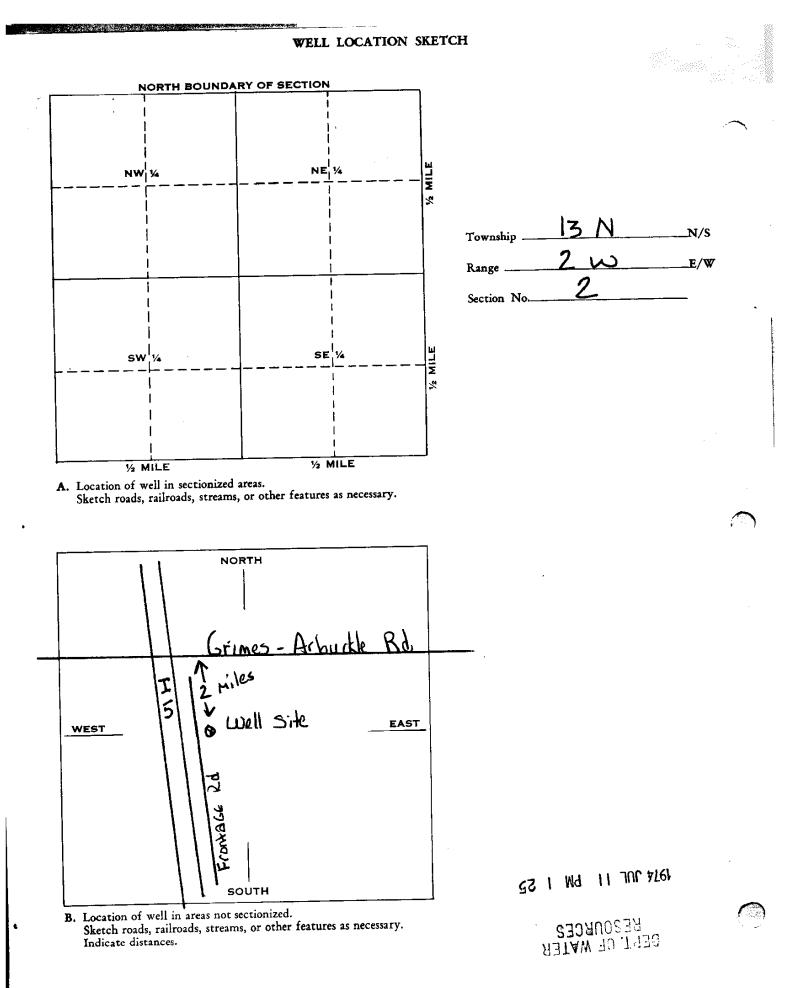
13N/02W-12. Do Not Fill In IRCES Nº 115408

State Well No.

									VISIT Lode See Tomas
((11) W	ELL LOG:	Waier Code Soc. 13752
N								770	ft. Depth of completed well ft.
N Ā							Total depth		baracter, size of material, and structure
						<u> </u>	Formation:	STRINGT OF COLOR, C	ft. toft.
$\frac{1}{2}$		N OF/W	τιι.					ጥፑና	T HOLE ONLY
				omua c'isawC	er if any		0	- 6	Top soil
		tion T13-		-2W, S			6	- 18	Gravel in clay
		s, railroads, etc					18	- 26	Loose gravel
Jistanee Itola		, (1 1110 1 0), et					26	- 34	Gravel in clay
	PE OF	WORK	(check):			34	- 45	Loose sand and grave
New Well [epening 🗌		ditioning] Destroyi	ng 🗋	45	- 76	Gravel in clay
lf destructio		e material an					76	- 92	Loose sand and grave
(4) PRC	DPOSEI	USE (cbeck)	:	(5) EQU	IPMENT:	92	- 182	Yellow clay
· ·		ustrial 📋			Rotary	X	182	- 206	Loose sand and grave
Irrigation	XX Tes	st Well 🔲	0	ther 🔲	Cable		206	- 252	<u>Gravel and clay mixe</u>
					Other		252	- 264	Loose gravel and roc
(6) CAS	SING I	NSTALL	ED:				264	- 376	Hard blue clay
STE	EL:	OTHE	R:	NONE	if gravel pac	:ked	376	- 380	Cemented rock
SINGLE [j bour	BLE []		-			380	- 386	Loose sand and grave
	1	1	Gage	Diameter	- 1	1	<u>386</u>	- 418	Hard yellow clay
From	To		or	of	From	To	418	- 434	Layers, sand & blue
fr	ít.	Diam.	Wall	Bore	ft	ft.			clay
							434	- 441	Hard blue clay
`				· · · -			441	<u> </u>	Sand and gravel
							446	<u>- 452</u>	Blue clay
size of shoe or	r well ring:			Size of gra	vel :		452	- 464	Sand and gravel
Describe joint							464	- 486	<u>Soft yellow clay</u>
• •		TIONS C	DR SCI	REEN: I	NONE		486	- 504	Sand and gravel
Type of perfo	ration of na	me of screen		1	Г		504 532	<u>- 532</u> - 536	<u>Hard yellow clay</u> Broken shale and cla
		-	Perf.	Rows		0'	536		
			per	per	1	Size		_ = = / /	
From fr.		Γo fr.	row		in	1. x in.	L	- 544	Hard blue clay
From ft.		ft.	row	ft.	in	1. x in.	544	- 559	Sand,gravel & shale
			row		in	1. x in.	544 559	<u>- 559</u> - 615	Band,gravel & shale Hard blue clay
			row		in	1. x in.	544 559 615	- 559 - 615 - 631	Band,gravel & shale Hard blue clay Broken shale and sar
			row		in	n. x in.	544 559 615 631	- 559 - 615 - 631 - 646	Band,gravel & shale Hard blue clay Broken shale and sar Hard yellow clay
			row			1. x in.	544 559 615 631 646	- 559 - 615 - 631 - 646 - 658	Band,gravel & shale Hard blue clay Broken shale and sar Hard yellow clay Gravel and broken shale
ft.		ft.		ft.	in		544 559 615 631 646 658	- 559 - 615 - 631 - 646 - 658	Band,gravel & shale Hard blue clay Broken shale and sar Hard yellow clay
ft. (8) COI	NSTRU				To what depth	1. x in.	544 559 615 631 646	- 559 - 615 - 631 - 646 - 658 - 726	Band,gravel & shale Hard blue clay Broken shale and sar Hard yellow clay Gravel and broken sh Hard yellow clay
(t. (8) COI	NSTRU sanitary se:	ft.	Yes D	ft.	To what depth		544 559 615 631 646 658	- 559 - 615 - 631 - 646 - 658 - 726	Band,gravel & shale Hard blue clay Broken shale and sar Hard yellow clay Gravel and broken sh Hard yellow clay
fr. (8) COI Was a surface Were aby stra	NSTRU sanitary sea	ft. (CTION: il provided?)	Yes D	ft. 	To what depth	ft.	544 559 615 631 646 658	- 559 - 615 - 631 - 646 - 658 - 726	Sand,gravel & shale Hard blue clay Broken shale and sar Hard yellow clay Gravel and broken sh Hard yellow clay Broken shale and cla
ft. (8) COI Was a surface Were any stra	NSTRU sanitary see tra sealed ag: ft.	ft. ICTION: I provided?) ainst pollution	Yes? Yes?	ft. 	To what depth	ft.	544 559 615 631 646 658	$\begin{array}{r} - 559 \\ - 615 \\ - 631 \\ - 646 \\ - 658 \\ - 726 \\ - 778 \end{array}$	Sand,gravel & shale Hard blue clay Broken shale and sar Hard yellow clay Gravel and broken sh Hard yellow clay Broken shale and cla
ft. (8) COI Was a surface Were any stra from	NSTRU e sanitary seeled ago ft. ft.	ft. CTION: al provided?) ainst pollution to	Yes Yes ft.	ft. 	To what depth	ft.	544 559 615 631 646 658 726 Work start WELL I	$\begin{array}{r} - 559 \\ - 615 \\ - 631 \\ - 646 \\ - 658 \\ - 726 \\ - 778 \\ \end{array}$	Sand, gravel & shale Hard blue clay Broken shale and sar Hard yellow clay Gravel and broken sh Hard yellow clay Broken shale and cla Broken shale and cla
fr. (8) COI Was a surface Were any stra trom trom Method of sea	NSTRU sanitary sealed age ft. ft. iting	ft. CTION: al provided?) ainst pollution to	Yes Yes ft.	ft. 	To what depth	ft.	544 559 615 631 646 658 726 Work start WELL I This 2	- 559 - 615 - 631 - 646 - 658 - 726 - 778 -	Sand, gravel & shale Hard blue clay Broken shale and sar Hard yellow clay Gravel and broken sh Hard yellow clay Broken shale and cla Broken shale and cla
fr. (8) COI Was a surface Were any stra From Method of sea (9) WA	NSTRU sanitary see sanitary see ft. ft. ft. hling TER I	ft. CTION: il provided? 1 ininst pollution to to	Yes []] ? Yes [] ft. ft.	ft. 	To what depth	ft.	544 559 615 631 646 658 726 Work start WELL I This 2	- 559 - 615 - 631 - 646 - 658 - 726 - 778 ed 5-12- ORILLER'S STA vell was drilled u iowledge and belie	Sand, gravel & shale Hard blue clay Broken shale and sar Hard yellow clay Gravel and broken sh Hard yellow clay Broken shale and cla Broken shale and cla 19 74, Completed 5-28- 19 74 TEMENT: nder my jurisdiction and this report is true to the best f. i
ft. (8) COI Was a surface Were any stra trom Herhod of sea (9) WA Depth at whi	nstru sanitary see sta sealed ag ft. ft. ft. thing TER I ich water w	ft. (CTION: al provided?) ainst pollution to to EVELS:	Yes [] 1 2 Yes [] ft. ft. ft. if known	ft. 	To what depth If yes, note	ft.	544 559 615 631 646 658 726 Work start WELL I This 2	- 559 - 615 - 631 - 646 - 658 - 726 - 778 ed 5-12- PRILLER'S STA vell was drilled u towledge and belie E. E. 1	Sand, gravel & shale Hard blue clay Broken shale and sar Hard yellow clay Gravel and broken sh Hard yellow clay Broken shale and cla Broken shale and cla 19 74 Completed 5-28- 19 74 TEMENT: nder my jurisdiction and this report is true to the best f. j LUHDORFF CO., INC.
fr. (8) COI Was a surface Were any stra trom trom Method of sea (9) WA Depth at whi Standing leve	NSTRU sanitary sea ita sealed ag ft. ft. iting TER I ich water w el before pe	ft. (CTION:)) provided?)) inst pollution? to to EVELS: as first found.	Yes] ? ? Yes] ft. ft. if known known	ft. 	To what depth If yes, noto	ft.	544 559 615 631 646 658 726 Work start WELL I This a of my kn	- 559 - 615 - 631 - 646 - 658 - 726 - 778 ed 5-12- ORILLER'S STA vell was drilled us toowledge and belie E. E. 1 (Potential States)	Sand, gravel & shale Hard blue clay Broken shale and sar Hard yellow clay Gravel and broken sh Hard yellow clay Broken shale and cla Broken shale and cla 19 74 Completed 5-28- 19 74 TEMENT: nder my jurisdiction and this report is true to the best f. j CUHDORFF CO., INC.
ft. (8) COI Was a surface Were any stra- trom trom Method of sea (9) WA Depth at whi Standing leve	nstru sanitary see sta sealed ag ft. ft. ft. hling NTER I ich water w el before per	ft. (CTION: al provided?) ainst pollution is to to EVELS: res first found, reforating, and d	Yes] ? ? Yes] ft. ft. if known known	ft. 	To what depth If yes, not ft.	ft.	544 559 615 631 646 658 726 Work start WELL I This a of my kn	- 559 - 615 - 631 - 646 - 658 - 726 - 778 - 778 - 778 - 778 - 26 - 778 - 726 - 778 - 726 - 778 - 726 - 7	Sand, gravel & shale Hard blue clay Broken shale and sar Hard yellow clay Gravel and broken sh Hard yellow clay Broken shale and cla Broken shale and cla 19 74 Completed 5-28- 19 74 TEMENT: nder my jurisdiction and this report is true to the best f. j CUHDORFF CO., INC. Sox 1326
fr. (8) COI Was a surface Were any stra- trom trom Method of sea (9) WA Depth at whi Standing leve Standing leve	NSTRU Sanitary see ta sealed ago ft. ft. ting ATER L ich water w el before pe el after pert ELL T	ft. ft. CTION: I provided? inst pollution: to to to to EVELS: as first found. reforating, if forating, and d ESTS:	Yes Yes ft. ft. ft. hif known known eveloping	ft. 	To what depth If yes, note ft. ft. ft. ft.	ft.	544 559 615 631 646 658 726 Work start Well I This a of my kn NAME	- 559 - 615 - 631 - 646 - 658 - 726 - 778 ed 5-12- ORILLER'S STA vell was drilled us toowledge and belie E. E. 1 (Potential States)	Sand, gravel & shale Hard blue clay Broken shale and sar Hard yellow clay Gravel and broken sh Hard yellow clay Broken shale and cla Broken shale and cla 19 74 Completed 5-28- 19 74 TEMENT: nder my jurisdiction and this report is true to the best f. j CUHDORFF CO., INC.
ft. (8) COI Was a surface Were any stra- trom trom Method of sea (9) WA Depth at whi Standing leve (10) W	NSTRU sanitary see ft. ft. ft. hing VTER I ich water w el before pe el after pert ELL T St made?	ft. (CTION: I provided?) inst pollution: to to to EVELS: as first found. rforating, if forating and d ESTS:	Yes Yes ft. ft. ft. hif known known eveloping	ft. ft. NONE No []	To what depth If yes, note ft. ft. ft. ft.	ft.	544 559 615 631 646 658 726 Work start Well I This a of my kn NAME	- 559 - 615 - 631 - 646 - 658 - 726 - 778 -	Sand, gravel & shale Hard blue clay Broken shale and sar Hard yellow clay Gravel and broken sh Hard yellow clay Broken shale and cla Broken shale and cla 19 74 Completed 5-28- 19 74 TEMENT: nder my jurisdiction and this report is true to the best f. j CUHDORFF CO., INC. Sox 1326

SKETCH LOCATION OF WELL ON REVERSE SIDE

Water Codo Sec. 13752 97139-750 8-72 SOM TRIP OT OSP



• الم	LOCATION NOT CHECK
ORIGINAL WATER WELI	DRILLERS REPORT Do Not Fill In
Pri Ali i i na di construcción de la constru	7077, 7078, Water Code) Nº 77457
REGIONAL WATER POLLUTION	F CALIFORNIA
CONTROL BOARD No. 5	F CALIFORNIA
e	
	Total depth 362 fr. Depth of completed well 362 f Formation: Describe by color, character, size of material, and structure.
	0 ft. to 10 ft. 10' Yellow clay & rocks
	<u> </u>
(2) LOCATION OF WELL:	18 110 92 Yellow clay and rocks
County Colusa Owner's number, if any	110 118 8 Rocks and gravel
R. F. D. or Street No.	
1/2 mile north & 1/8 mile west of SE corner in Sec. 15 Twp 13 NR2W	$- \frac{101}{196} \frac{150}{245} \frac{15}{49} \text{ Yellow clay & silt}$
UI SE COINEI IN SEC. IS INP IS NAZW	- <u>245</u> 249 4 Sand & gravel
	<u>249 270 21 Yellow clay & silt</u>
	<u>270 291 21 Loose sand & gravel</u>
(3) TYPE OF WORK (check):	<u>291 310 19 Blue clay</u>
New well 🕱 Deepening 🗌 Reconditioning 🗌 Abando	
If abandonment, describe material and procedure in Item 11.	<u>314 342 28 Blue clay</u> T: 342 359 17 Loose rock, gravel
(4) PROPOSED USE (check): (5) EQUIPMEN	T: <u>342 359 17 Loose rock, grave1</u> <u>359 362 3 Blue clay</u>
Domestic 🖾 Industrial 🗌 Municipal 🗌 Rotary 🖸	
Irrigation Test Well Other Dug Well	4 (f
(6) CASING INSTALLED: If gravel packed	
From ft. to ft. Diam. Wall of Bore ft.	to the the test of the test of the test of the test of
0 362 8 ¹¹ 188 18 ¹⁰ 0 362	• • • • • • • • • • • • • • • • • • •
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	u u u
Type and size of shoe or well ring Size of gravel: Rerun p	
Type and size of shoe or well ring Size of gravel: REFULL p Describe joint Butt welded	
Butt Welden	
(7) PERFORATIONS:	
Type of perforstor used Machine cut at factory	
Size of perforations 1/8 in., length, by 3	in,
From (e, to ft. Perf. per row Rows)	<u>ft.</u> <u>u</u> <u>u</u>
р о р й н и и и	
· · · · · · · ·	
(8) CONSTRUCTION:	" " " " " " " " " " " " " " " " " " "
Was a surface sanitary seal provided? I Yes M No To what depth	fr.
Were any strata scaled against pollution? I Yes XXN0 If yes, note depth of strata	- Mater dy
From ft.	
Method of Sealing	Work started Aug. 29 1963 Completed Sept. 9 1963
Include of Scaling	work started Aug. 29 1963 Completed Sept. 9 1963
(9) WATER LEVELS:	WELL DRILLER'S STATEMENT:
Depth at which water was first found	ft. This well was drilled under my jurisdiction and this report is true to the best o ft. my knowledge and belief.
	11. NAME E. E. LUHDORFF
ending level after perforating	ft. (Person, firm, or corperation, (Typed or printed)
(10) WELL TESTS: m See over for test	
Was a pump test made? 图 Yes □ No If yes, by whom E.E. Luhdorff Co.	Woodland, California
Was a pump test mede? Af Yes No If yes, by whom D. L. Buildofff Yield: gal./min. with ft. draw down after	[SIGNED] E.E. Suchdorff
	- 1 22211 Ver Driver 22
Temperature of water 🛛 🛛 🐨 🕷 No	License Market 123211 Dated Sept. 2.1

Ala 1. S. S. S. D.

> 1 - 1 A and the management of . . . 3

Results of test:

Y LL & Strip S transform S L & G to Alm Yesser of the activity of the P Aris and C to Alm Yesser S to Alm C to Alm Alm S to Alm L to Alm Alm C to Alm Alm C to Alm Alm C to Alm 550 GPM @ 200' P.L. 370 190 100 zetara -ti ti 🖞 🖞 📖 --ter toja ili i . --- , n naug O sin

196

191

188

185'

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 $X_{\rm eff} = 0.01$ 5.20

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College 4/2 (m. 2014) - 10 (2012) - 1 62 24 (dumenting 824) - 11 (2

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	AL h DWR _ of1		A	UG		<u>z</u> l	Refer to Ins)N Pam	REPOR	Г		3. N i	<u>0'5</u>	.¦W]1	20	
•	Well No	25489		-	w o		№ 8/04/92	• 42	3	344				1			
ate Wo	rk Began _	08/03	3/92		Ended	$\frac{08}{-1+}$	3/04/92		-	•		l	LATITUDE		1	LC	
		0.7.7.7	$\frac{1}{2}$				h Dept,				_				APN/TE		
Peri	mit No			CIC	Pe LOG		Date					v	ELL O	WNE	в		
ORIENTAI	rion (ビ)			_ ног	IZONTAL	AN	IGLE (S		1						N.		_
DEPTH	FROM	DEPTH	TO FIRS		ER ESCRIPTI		BELOW SUR	FACE	ſ								
	FACE		Descr		terial, grain s		olor, etc.		ī								
0	3	Soil				,			_ Ade				orth				ve.
3	16	Grav	el						City				est o	f Wy	ver I	Road	
16	; 30 ;	Clay							Coi		olus						
30	100			1 St	reaks c	of (Gravel		API	N Book <u>2</u>	l i	age	130	Ратее		2	
100	+	Clay								vnship <u>13</u>	<u>N</u> I	lange _	<u>2 W</u>	Sectio	n	20 +	۲
125			& Gr	ave	L				Lat	itude	MIN.	SEC.	NORTH	Longi	tude _	DEG.	J WEST MIN, SEC.
<u>140</u> 185	185	Clay	el &	Car		• .		 			CATI	ON SK	ЕТСН				CTIVITY (∠) — NEW WELL
<u>185</u> 196		Clay		Jall	<u> </u>			F				North -		_		1	
210	210		el &	San	 1			{				750	Ft	Wyer		MODI	FICATION/REPAIR
225	240	Clay								X	ं ←						Deepen Other (Specify)
240	· ·		el &	San	d					•				ದ		1	
252	· ·	Clay												•			DESTROY (Describe
300			el &	San	d					550						1	Procedures and Materials Under "GEOLOGIC LOG")
315	320	Clay							sT	0 म					ts	- PL	ANNED USE(S) -
	i i								Ä	ĥ					ĒA		(⊻) MONITORING
		<u> </u>														WATE	RSUPPLY
					,									ļ		+	X_ Domestic
`	-								N	Marine A	æ.			_			Public
<u> </u>																	Irrigation
	+ +																Industrial
																-	"TEST WELL"
	<u> </u>											SOUTH -				-	CATHODIC PROTEC-
									S14	ustrate or Descr ch as Roads, Bu	ildings	, Fences,	Rivers, et	с.	marks	-	OTHER (Specify)
	1								PL	EASE BE AC	CURA	TE & C	OMPLET	E.			
			<u> </u>							Ling 'Hod	Ro	tary			FLUID		Mud
	1							ŀ		- WATER		EL &	YIELD			LETE	D WELL
										TH OF STATIC	;		(Ft.) & D	ATE M	EASURE	ED	
	, .	1							EST	IMATED YIELD	•		(GPM) &	TEST	TYPE _		
TOTAL I	DEPTH OF	BORING	32()(Fe	et)				TES	T LENGTH	(Hrs.) TO	TAL DRA	WDOW	/N	((Ft.)
TOTAL I	DEPTH OF	COMPLETE	D WEL	L	<u>320</u> (F	'eet)			* M	lay not be repr	esental	ive of a	well's lor	ıg-term	ı yield.		
					<u> </u>	С	ASING(S)								ANNU	JLAR	MATERIAL
	EPTH SURFACE	BORE- HOLE	TYPE	(∠)			T				 ⊧	DEPT ROM SU		L			YPE
		DIA.			MATERIA		INTERNAL DIAMETER	GAUGE OR WAL		SLOT SIZE	⊪			CE-		EU	FILTER PACK
Ft.	to Ft.	(Inches)	BLANK SCREEN	DUCTOR FILL PIPE	GRADE	=	(Inches)	THICKNE		(Inches)	1	Ft. to	Ft.		r TONITE ((TYPE/SIZE)
0	: 200	9" -	XX		F-480		5"	$-\frac{1}{4}$			1	0 ;	25	X	+	Ĺ	
200	,	9"	XX		F-480		5"	1 H 4		.032		25 <u> </u>	340				Pea Gravel
260			XX		F-480		5"	111				1				L	$\frac{1}{4}$ X $\frac{1}{2}$
300	320	9"	XX		F-480		5"	<u>1</u> (1 4		.032		, ,					1
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	<u></u>		ĻĻĻ		i							1			<u> </u>		
~	- ATTACH	IMENTS	(⊻)-	-		م ام جون	reignod a-			CERTIFIC A					et of m		vledge and belief.
` .	Geologic	Log				unae	•							me De	อเบเท	IY KOOV	
	Well Con	struction Dia	.gram		NAME	(PERS	Vaca On, Firm. or C	ORPORATION	(TYP	g Co./ E	et.	ст с м	UL.				
		icał Log(s)				, v		• Box			•	Vaca	ville	2		CA	95696
		er Chemical	Analyses		ADDRES	5		<u>. D.</u>			~	vucc	CITY			STATE	ZIP
	Other				- 11		$\times / /$	1. 1		1				-			500650
					Signed		Dou	an	1	Lew	K			8-1	0-9	2	532679

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OPICINAL			STATE	OF CALIFO	ρλιτλ			Y	- 00	NOT FILL IN
	AY 06 2010	WELL		LETIO		RT THN	IO	8	1	S I I
Page 1 of 4				struction P	-		STATE W		D./ STA	TION NO.
Owner's Well No	<u>8454</u>		N	° E01 (09311					
Date Work Began		Ended 4/1/20		— A	-BCD		DE	1 .	L	ONGITUDE
Local Permit A	gency Colusa Count	y Health Dep	t2/1	•		_ L_L_L_L		N/TRS/	OTHER	
Permit No. 20	DIO-018 GEOLOGIC	LOG	Date <u>3/1</u>	//2010				<u>.</u>		•
	DRILLING ROTARY									
DEPTH FROM SURFACE		ESCRIPTION								
Ft. to Ft.		rial, grain, size	e, color, et			WELL I				
	Top soil Brown clay with grav	vol stroaks				Vof Wilson Bend	Rd & 84	<u>0''So</u>	of	
	Sand and gravel	Versuears			City Fruchtenic					
	Sand and gravel wit	h brown clay	streaks		County COLUS		D 1	057		
	Sand and gravel				Township 14 N	Page <u>130</u> Range <u>1_ E</u>	Parcel Section	<u>. 35</u>		·
	Sandy blue clay				Latitude		- Section	1.00		
	Black sand with blue	e clay streaks			DEG.	MIN. SEC. CATION SKETCH	í <u> </u>		DEG.	MIN. SEC. CTIVITY (🗹) —
1000 1540	Sandy blue clay					NORTH				NEW WELL
										FICATION/REPAIR
1	l									—— Deepen —— Other (Specify)
1										
									F	DESTROY (Describe Procedures and Materials Jnder "GEOLOGIC"LOG"
1										NNED USES(∠)
	 				L				WATE	R SUPPLY
					WEST			AST		Domestic Public rrigation Industrial
I					>			ш		
					•					
										DIC PROTECTION
	ŕ									DIRECT PUSH
			•			•				
1									VAP	SPARGING
I	 				Illustrate or Describe	Distance of Well from Roads,	Buildings,			REMEDIATION
	l				Fences, Rivers, etc. and	l attach a map. Use additio BE ACCURATE & COM	nal paper if		C	DTHER (SPECIFY)
	· · · · · · · · · · · · · · · · · · ·			†	WATE	R LEVEL & YIELI	OF CO	MPL	ETED	WELL
						water				
					DEPTH OF STATIC					
						(Ft.) & DAT				
TOTAL DEPTH OF	BORING 1540 (Fee	et)				* (GPM) & (Hrs.) TOTAL DRA				
TOTAL DEPTH OF	COMPLETED WELL 10	15 (Feet)				esentative of a well's			• •	
							1			
DEPTH FROM SURFACE	BORE - TYPE (<u>✓</u>)	C	ASING (S)			DEPTH FROM SURFACE		ANNU		MATERIAL PE
	DIA. (Inches) BIANK LITT bICON- DICON- DICTON- DICTON-	MATERIAL /	INTERNAL	GAUGE	SLOT SIZE		CE-	BEN-	<u> </u>	
Ft. to Ft.	DIA. (Inches) DIAU	GRADE	DIAMETER (Inches)	OR WALL THICKNESS	IF ANY S (Inches)	Ft. to Ft.				FILTER PACK (TYPE/SIZE)
Zone 1						0 30		<u>(⊻)</u>	·(<u>√</u>)	Sand Slurry
0; 50	14 🗸	PVC	2.5	SCH 8	0			\checkmark		Bentonite Seal
50; 60	14 🗸	PVC	2.5	SCH 8	0.030	40 71			✓	SRI#8 Sand
60; 70	14 🗸	PVC	2.5	SCH 8	0	71 84		\checkmark		Bentonite Seal
Zone¦ 2 0¦ 135		PVC	2.5	SCH 8	_	84 113		~	✓	SRI#8 Sand
			2.0			113 123 TION STATEMEN		•		Bentonite Seal
Geologic	Log /	I, the undersig	ned, certify th	at this report is	s complete and accurat	te to the best of my knowle		elief.		
	struction Diagram			LLING CO.	TION) (TYPED OR PR					
Soil/Wate	Chemical Analysis		KENTUC			WOODLA	ND			95695
	FORMATION, IF IT EXISTS.	Signed	Marh I	Jamin			04/29/10)	STATE	^{ZIP} C57 A HIC - 13378
DWR 188 REV. 11-97					REPRESENTATIVE		ATE SIGNE	ED		C-57 LICENSE NUMBER

ORIGINAL File with,DWR	TT (17)		OF CALIFORM			SE ONLY -	DONOTFILLIN
Page 2 of 4	WE		LEIION struction Pan	N REPOF		TATE WELL N	O./ STATION NO.
Owner's Well No	. 8454	No	[.] E010	9311			
	3/29/2010 Ended4	1/1/2010			LATITUD		LONGITUDE
	gency Colusa County Health					111	
Permit No. 2	010-018 P	Permit Date 3/1	7/2010			APN/TRS	/OTHER
	GEOLOGIC LOG -						-
ORIENTATION (⊥)		ANGLE	(SPECIFY)				
DEPTH FROM	METHOD ROTARY						
SURFACE Ft. to Ft.	DESCRIP Describe material, gra						
	Top soil			Adamaa 225' \A	of Wilson Bend R	2 x 2 2 2 1 1 1 2	of
5 42	Brown clay with gravel strea	aks		City Fruchtenic		<u>u u u u u u</u>	<u>01</u>
	Sand and gravel			County COLUS			
	Sand and gravel with brown	n clay streaks		•	Page <u>130</u>	Parcel 057	
	Sand and gravel				Range1_E		
	Sandy blue clay			Latitude	-	-	1
	Black sand with blue clay st Sandy blue clay	reaks	·		MIN. SEC. CATION SKETCH.		DEG. MIN. SEC. → ACTIVITY (✓)
1000 1040			 _		NORTH		
							MODIFICATION/REPAIR
I	I						Deepen Other (Specify)
	1						····
1	I I						DESTROY (Describe Procedures and Materials
1	 						Under "GEOLOGIC LOG" PLANNED USES (\checkmark)
	 						WATER SUPPLY
	I I	<u></u>	MES			EAST	Domestic Public Irrigation Industrial
	 		s		,	ш	
1	1						TEST WELL
	1 						CATHODIC PROTECTION HEAT EXCHANGE
							DIRECT PUSH
							VAPOR EXTRACTION SPARGING
					SOUTH		REMEDIATION
1			F	Fences, Rivers, etc. and	Distance of Well from Roads, attach a map. Use additiona	al paper if	OTHER (SPECIFY)
i 	, [n		E ACCURATE & COM		·
	l 				R LEVEL & YIELD		
1	 			DEPTH TO FIRST ' DEPTH OF STATIC	WATER (Ft.) BE	LOW SURFAC	E
	I				(Ft.) & DATE	MEASURED _	
i	1540				* (GPM) & 1		
TOTAL DEPTH OF	(=)		т	TEST LENGTH	(Hrs.) TOTAL DRAW	/DOWN	(Ft.)
TOTAL DEPTH OF	COMPLETED WELL <u>1015 (</u>	(Feet)		May not be repr	resentative of a well's l	ong-term yiel	<i>d</i>
DEPTH	POPE	CASING (S)			DEPTH	ANNU	JLAR MATERIAL
FROM SURFACE	BORE - TYPE (<u>✓</u>)				FROMSURFACE		TYPE
	DIA. (Inches) HITER (Inches) HITER (Inches) HITER HITE		GAUGE OR WALL	SLOT SIZE IF ANY		CE- BEN- MENT TONITE	FILTER PACK
Ft. to Ft.		(Inches)	THICKNESS	(Inches)	Ft. to Ft.	(⊻) (⊻)	(✓) (TYPE/SIZE)
135 145	14 🖌 PVC	2.5	SCH 80		123 250		✓ SRI#8 Sand
145 215 215 225	14 ✓ PVC 14 ✓ PVC	2.5	SCH 80		250 275	✓	Bentonite Seal
215 225 225 245	14 ✓ PVC 14 ✓ PVC	2.5	SCH 80 SCH 80		275 525 525 529		✓ SRI#8 Sand
Zone: 3		2.5	301 00	' 	525 529 529 736		Bentonite Seal
0 545	-14/10	2.5	SCH 80		736 747		Bentonite Seal
	IMENTS (\checkmark)			CERTIFICA	TION STATEMENT	· · · ·	
Geologic	Log I, the	undersigned, certify the	at this report is o		e to the best of my knowled		
	nstruction Diagram NAN cal Log(s)	ME <u>EATON DRIL</u> (PERSON, FIRM, OF		ON) (TYPED OR PR	INTED)		
Soil/Wate	r Chemical Analysis 20	WEST KENTUCH			WOODLAN CITY	ID	CA 95695
ATTACH ADDITIONAL II	NFORMATION, IF IT EXISTS.	ed _Marh I_	Damion		0	4/29/10	STATE ZIP <u>C57 A HIC - 1337</u> 8
DWR 188 REV. 11-97	IF ADDITIONAL SP			EPRESENTATIVE		TE SIGNED	C-57 LICENSE NUMBER

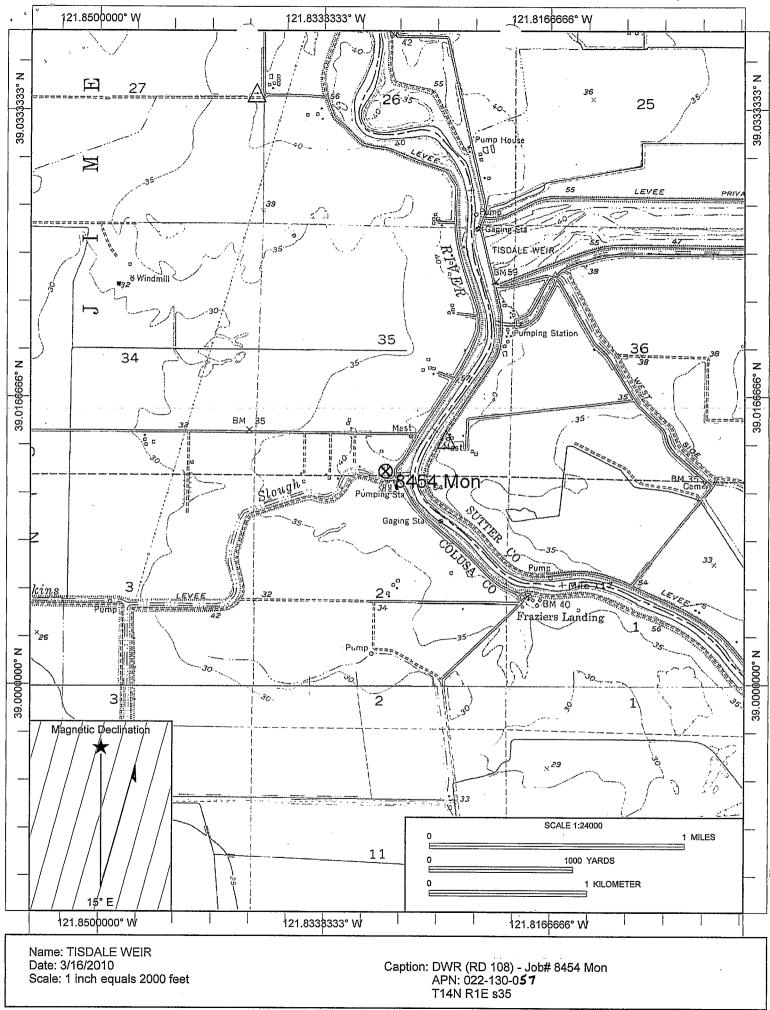
RIGIN/			WELL		of califo PLETIO	NNIA		JSE ONLY	DO	
age 3 of					nstruction F			STATE WEL	L NO./ STA	TION NO.
	Well No			N	∘ E01	09311				
		3/29/2010	•				LATITUE	E .	L	ONGITUDE
Local	Permit A	gency Colusa Coun					- <u> </u>			
Perm	nit No. 2	010-018	C LOG	: Date <u>3/1</u>	7/2010			APN/	TRS/OTHEF	۲ ــــــ
ORIENTA	NTION (⊥)		ORIZONTAL	ANGLE	_(SPECIFY)					
	I FROM	METHOD ROTARY)					
	FACE o Ft.	Describe mat	DESCRIPTION erial, grain, siz	ze color e	tc					
<u></u>		Top soil	criat, grain, st				of Wilson Bend F	UCA LIVI	Nort	
5		Brown clay with gra	vel streaks					<u>(a & 840</u>	Sor	
42		Sand and gravel				City <u>Fruchtenic</u> County <u>COLUS</u>				
70		Sand and gravel wi	th brown clay	streaks		-				
210		Sand and gravel				APN BOOK UZZ	Page <u>130</u> Range <u>1_ E</u>		<u>25</u>	
230		Sandy blue clay				I ownship 14 IV	Range <u></u>	Section 2	30	· · ·
980	1000	Black sand with blu	e clay streak	s		Latitude	IIN. SEC.		DEG.	MIN. SEC.
1000	1540	Sandy blue clay					CATION SKETCH			CTIVITY (🗹)
		l					NORTH			NEW WELL
		1								FICATION/REPAIR — Deepen
I		 								Other (Specif
 		۰ <u>۰</u>								DEPTROV (T
1		I I								DESTROY (Describ Procedures and Ma
1		l l								Under "GEOLOGIC NNED USES (
!		1				L_				R SUPPLY
		1				WEST			- ST	Domestic Pub Irrigation Ind
		I I				3			<u>م</u> ا – ا	MONITORING
		I								TEST WELL
i		l							САТНО	DIC PROTECTION
i		I								HEAT EXCHANGE
		t ·								DIRECT PUSH
i		 							VAP	OR EXTRACTION
 		ł †								SPARGING
		J				Illustrate or Describe D	SOUTH	Buildings,	_	REMEDIATION
] 				Fences, Rivers, etc. and necessary. PLEASE BI	attach a map. Use addition ACCURATE & COM	al paper if PLETE.		OTHER (SPECIFY)
		· · · · · · · · · · · · · · · · · · ·		<u> </u>	†	WATEI	R LEVEL & YIELD	OFCOM		WETT
i		l				DEPTH OF STATIC	VATER (Ft.) BE	LUW SURP	ACE	
1		L					(Ft.) & DATE	E MEASUREI	D	
		BORING 1540				ESTIMATED YIELD *	(GPM) &	TEST TYPE		
		(4)	eet)			TEST LENGTH	(Hrs.) TOTAL DRAV	VDOWN	(Ft.)	• •
OTAL DI	EPTH OF	COMPLETED WELL 10	(Feet)			May not be repre	esentative of a well's	long-term y	vield.	
DEP	тн		C	ASING (S)					UNTIL A D	MATERIAL
FROMรีบ	IRFACE	BORE - TYPE (<u>·</u>)		T			DEPTH FROM SURFACE			PE
		DIA. BIANK (Inches)	MATERIAL / GRADE	INTERNAL DIAMETER	GAUGE	SLOT SIZE IF ANY			EN-	FILTER PAC
Ft. to	Ft.		GIVIUE	(Inches)	THICKNES		Ft. to Ft.	1 1	NITE FILL ∠) (⊻)	(TYPE/SIZE)
545	555	10-3/4 1	PVC	2.5	SCH 8	.030	747 932			SRI#8 Sand
555 ¦	610	10-3/4 🗸	PVC	2.5	SCH 8		932 937		~ 	Bentonite Se
610¦	620	10-3/4 🗸	PVC	2.5	SCH 8	.030	937 1039			SRI#8 Sand
	695	10-3/4 🗸	PVC	2.5	SCH 8		1039 1049			Bentonite Se
620¦		10-3/4	PVC	2.5	SCH 8		1049 1060			Native Fill
695	705		PVC	2.5	SCH 8	50	1060 1440			Sand Slurry
•	736	10-3/4					TION STATEMEN	г		
695 705	736 ATTACH	IMENTS (⊻)								
695 705	736 ATTACH Geologic	IMENTS (⊻)	I, the unders	gned, certify th ATON DRII	nat this report i	s complete and accurate	to the best of my knowle		¥f.	
695 705	736 ATTACH Geologic Well Cor Geophysic	IMENTS (⊻) Log nstruction Diagram cal Log(s)		ATON DRII SON, FIRM, O	LLING CO. DR CORPORA	s complete and accurate	to the best of my knowle	dge and belie		
695 	736 ATTACH Geologic Well Cor Geophysic Soil/Wate	IMENTS (⊻) Log nstruction Diagram		<u>ATON DRII</u>	LLING CO. DR CORPORA	s complete and accurate	to the best of my knowle	dge and belie	CA	95695 ZIP
695 705 	736 ATTACH Geologic Well Cor Geophysic Soil/Wate Other	IMENTS (⊻) Log nstruction Diagram cal Log(s)	NAME_E (PER 20 WES ADDRESS Signed	ATON DRII ISON, FIRM, O TKENTUC	LLING CO. DR CORPORA KY AVE	s complete and accurate	to the best of my knowle NTED) WOODLAN CITY	dge and belie	CA STATE	

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ORIGINAL		OF CALIFORNIA		DO NOT FILL IN
File with DWR		PLETION REPC		
Page 4 of 4		Instruction Pamphlet	STATE WELL	NO./ STATION NO.
Owner's Well No	8454	^{№.} E0109311		
Date Work Began	3/29/2010 , Ended 4/1/2010		LATITUDE	LONGITUDE
Local Permit A	gency Colusa County Health Dept	····		
Permit No. 20	010-018 Permit Date <u>3</u>	17/2010	APN/TR	S/OTHER
	GEOLOGIC LOG			-
ORIENTATION (✓)	VERTICAL HORIZONTAL ANGLE	(SPECIFY)		
	DRILLING ROTARY FLUID MU			
DEPTH FROM SURFACE	DESCRIPTION			
Ft. to Ft.	Describe material, grain, size, color,			
	Top soil		Wof Wilson Bend Rd & 840 S	Sof
	Brown clay with gravel streaks	City Fruchter	nicht CA	
	Sand and gravel	County COLL	JSA	
	Sand and gravel with brown clay streaks	APN Book 02	2Page <u>130</u> Parcel <u>057</u>	7
	Sand and gravel	Township 14	NRange1_ESection 35	5
	Sandy blue clay	Latitude		
	Black sand with blue clay streaks	DEG.	MIN. SEC.	DEG. MIN. SEC.
1000 1540	Sandy blue clay		OCATION SKETCH	ACTIVITY (∠)
 				MODIFICATION/REPAIR
				Deepen
 				Other (Specify)
I				DESTROX (Describe
 		<u></u>		DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG"
 				PLANNED USES (∠)
l				WATER SUPPLY
		MEST	T S S T	Domestic Public
1		3	14	
l I				
				CATHODIC PROTECTION
•				HEAT EXCHANGE
1				DIRECT PUSH
1				INJECTION
				VAPOR EXTRACTION SPARGING
1	· · · · · · · · · · · · · · · · · · ·		SOUTH	REMEDIATION
1		Fences, Rivers, etc.	be Distance of Well from Roads, Buildings, and attach a map. Use additional paper if	OTHER (SPECIFY)
		necessary. PLEASI	BE ACCURATE & COMPLÈTE.	
		WAT	TER LEVEL & YIELD OF COMPI	LETED WELL
		DEPTH TO FIRS	T WATER (Ft.) BELOW SURFAC	DE
!		DEPTH OF STAT	10	
			(Ft.) & DATE MEASURED -	
TOTAL DEPTH OF	ортыс 1540 ст		D * (GPM) & TEST TYPE	
1		TEST LENGTH_	(Hrs.) TOTAL DRAWDOWN	(Ft.)
TOTAL DEF TH OF	COMPLETED WELL 1015 (Feet)	May not be re	epresentative of a well's long-term yie	eld.
DEPTH	CASING (S		ANN	ULAR MATERIAL
FROM SURFACE	BORE TYPE (1)			TYPE
			CE- BEN-	
Ft. to Ft.	DIA. Image: Second se	R OR WALL IF ANY THICKNESS (Inches)		FILL FILTER PACK
Zone 4				
	14/10/8 V PVC 2.5		1440 <u> 1540 </u>	V Native Fill
985 995				
995; 1015	8-3/4 ✓ PVC 2.5 8-3/4 ✓ PVC 2.5			
				· · · ·
Geologic	MENTS (∠)		CATION STATEMENT	
Well Cor	struction Diagram	RILLING CO.		
		OR CORPORATION) (TYPED OR		CA 05005
Soil/Water Other	ADDRESS //	N +	CITY	CA 95695 STATE ZIP
	IFORMATION, IF IT EXISTS. Signed Mark	Dauron	04/29/10	<u>C57 A HIC - 1337</u> 8
DWR 188 REV. 11-97	IF ADDITIONAL SPACE IS NEEDED	AUTHORIZED REPRESENTATIVE		C-57 LICENSE NUMBER

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	iay 1948	UNITED STATES DEPARTMENT OF THE INTERIOR PRODUCTS GEOLOGICAL SURVEY WATER RESOURCES BRANCH Other N WELL LOG We how NO	os •hap	
			and the second s	E-
	State Califo			
.HER		enn Morris		
YH C3.U:		400 feet north, 2150 feet west of St corner (USER)		· · · ·
LING METHOD.				
	Tilled by_	AulmanAddress		
LE OF CASING D	inte_ <u>5-194</u> :	2 Casing diam16 Land-surf.	alt.	31.
8FORATIONS	Source of da	taDriller (USBR)		
TER LEVEL BER	<u>(Enter t</u>	ype of well, perforations, yield, and drawdown at end of	log)	
ISTIC :ATA: DISC!	correlation	Naterial	Thick-	Depth
HER DATA AVA			(feet)	(feet)
URFACE ELEY		Surface coil		
DEPTH		an a	Careta Terranens	7
	General de la companya de la company Recompanya de la companya de la comp	Clay, gray	29 The Wither water and a state	36
1.20 + 51-		Clay, sandy Sandy	6	42
		\$4/##Gravel	202	651
		Att Clay, soft	<u>3½</u>	70
		Clay, tough	3	73
		Perforated 46-701		
		1300 GPM Rodwood-plug		-
		Rotary 7.3-feet to water level		
	• ;	6		
			•	
-0				
-				
CENIATED DO.	word by	Del		
- mp. sas ince 🕄		Date	13 14 V	5

STATE OF CALIFORNIA THE RESOURCES AGENCY OF CALIFORNIA DEPARTMENT OF WATER RESOURCES

JUL 1 3 ISPOR No. 14N/IW-4K3 BRANCH NORTHERN

WELL DATA

A

Tenant				Other No	
Address			[-		······································
Type of Well: Hydrog	raph 🗍 Key	/ Index	Semiannı		
Location: County			Basin Ca	CUSA Co.	No 5-21
	GRIMES			0 1 1	5-1950
<u>N.W 1/4 5E</u>		4 Two 14	N Raa /		545C
Description	0 M1. W/0	DRY SLOUG CHREITER RO	H RO.	ON H SACHRE	TER Ro, TH
Reference Point descri	ption $_{-}$ $\mathcal{T} \cdot \mathcal{O}$.	C. UNDER	P.B., N	. <i>SIDE</i>	
	· ·	· · · · · · · · · · · · · · · · · · ·			
which is@	ft. above land	surface. Ground Elev	ration 3	5.0	<u> </u>
Reference Point Elev.	75 -		USES	QUAD	
Well: Use <u><u></u></u>	16	Condition	· · ·		Depth73
Casing, size/C	in., perfor	ations <u> </u>	1070	See log allate	
Measurements By: DW	VR 🖌 USGS 🗌] USBR County	Irr. Dist.	. 🔄 Water Dist. 🗌 Con	ns. Dist. 📋
				Depth to Bot. Aq	
Type of Material				Thickness	
	s No 🗌			Depth to Bot. Gr	
Supp. Aquifer		Depth to Top Aq	[•	Depth to Bot. Aq	
Driller Aucmi				······	······
·	5 <i>2.1</i> 3.4	a filed	138 K 16 6 1.		antidential (2)
Date drilled	Log	g, 11100	CADIC WY	open (1)c	
Equipment: Pump, type	e TURBING	≤ make	PEERLO	555	
Equipment: Pump, type Serial No. <u>13184</u>	e CIRBING 7 Size of disc	≤make harge pipe0in	PEERLO Water Analy	£55 sis: Min. (1) San. (2)H.M. (3)
Equipment: Pump, type Serial No. <u>JJ184</u> Power, Kind <u>ELEC</u> .	e Size of disc Size of disc	stand pipe make harge pipe in S. E.	- PEERLO Water Analy Water Level	<i>E S S</i> sis: Min. (1) San. (2 s available: Yes (1)) H.M. (3) No
Equipment: Pump, type Serial No. <u>131847</u> Power, Kind <u>ELEC.</u> H. P. <u>25</u> N	e Size of disc Size of disc Make Motor Serial No. //	≤make harge pipe0in S.E HJ6918274	. Water Analy Water Level Period of Re	<i>Ess</i> sis: Min. (1) San. (2 s available: Yes (1) ecord: Begin) H.M. (3) No End
Equipment: Pump, type Serial No. <u>131847</u> Power, Kind <u>ELEC.</u> H. P. <u>25</u> N Elec. Meter No. <u>80</u>	e Size of disc Size of disc Make Motor Serial No Z 33 Transf	≤	Water Analy Water Level Period of Re Collecting A	<i>E </i>) H.M. (3) No End
Equipment: Pump, type Serial No. <u>131847</u> Power, Kind <u>ELEC.</u> H. P. <u>25</u> N Elec. Meter No. <u>80</u>	e Size of disc Size of disc Make Motor Serial No Z 33 Transf	≤	Water Analy Water Level Period of Re Collecting A	<i>Ess</i> sis: Min. (1) San. (2 s available: Yes (1) ecord: Begin) H.M. (3) No End
Equipment: Pump, type Serial No. <u>131847</u> Power, Kind <u>ELEC.</u> H. P. <u>25</u> N Elec. Meter No. <u>80</u>	e Size of disc Size of disc Make Motor Serial No Z 33 Transf	≤	Water Analy Water Level Period of Re Collecting A	<i>E </i>) H.M. (3) No End
Equipment: Pump, type Serial No. <u>131847</u> Power, Kind <u>ELEC.</u> H. P. <u>25</u> N Elec. Meter No. <u>80</u> Yield	e Size of disc Size of disc Make Aotor Serial No. // G.P.M. Pur G.P.M. Pur	≤	Water Analy Water Level Period of Re Collecting A	<i>Ess</i> sis: Min. (1) San. (2 s available: Yes (1) ecord: Begin Agency: (1) Pump Test (2)) H.M. (3) No End
Equipment: Pump, type Serial No. <u>131847</u> Power, Kind <u>ELEC.</u> H. P. <u>25</u> N Elec. Meter No. <u>80</u> Yield	e Size of disc Size of disc Make Motor Serial No Z 33 Transf	≤	Water Analy Water Level Period of Re Collecting A	<i>E </i>) H.M. (3) No End
Power, Kind <u><i>ELEC.</i></u> H. P. <u>25</u> <u>N</u> Elec. Meter No. <u>80</u> Yield	e Size of disc Size of disc Make Aotor Serial No. // G.P.M. Pur G.P.M. Pur	≤	Water Analy Water Level Period of Re Collecting A	<i>Ess</i> sis: Min. (1) San. (2 s available: Yes (1) ecord: Begin Agency: (1) Pump Test (2)) H.M. (3) No End
Equipment: Pump, type Serial No. <u>131847</u> Power, Kind <u>ELEC.</u> H. P. <u>25</u> N Elec. Meter No. <u>80</u> Yield	e Size of disc Size of disc Make Aotor Serial No. // G.P.M. Pur G.P.M. Pur	≤	Water Analy Water Level Period of Re Collecting A	<i>Ess</i> sis: Min. (1) San. (2 s available: Yes (1) ecord: Begin Agency: (1) Pump Test (2)) H.M. (3) No End
Equipment: Pump, type Serial No. <u>131847</u> Power, Kind <u>ELEC.</u> H. P. <u>25</u> N Elec. Meter No. <u>80</u> Yield	e Size of disc Size of disc Make Aotor Serial No. // G.P.M. Pur G.P.M. Pur	≤	Water Analy Water Level Period of Re Collecting A	<i>Ess</i> sis: Min. (1) San. (2 s available: Yes (1) ecord: Begin Agency: (1) Pump Test (2)) H.M. (3) No End
Equipment: Pump, type Serial No. <u>131847</u> Power, Kind <u>ELEC.</u> H. P. <u>25</u> N Elec. Meter No. <u>80</u> Yield	e Size of disc Size of disc Make Aotor Serial No. // G.P.M. Pur G.P.M. Pur	≤	Water Analy Water Level Period of Re Collecting A	<i>Ess</i> sis: Min. (1) San. (2 s available: Yes (1) ecord: Begin Agency: (1) Pump Test (2)) H.M. (3) No End
Equipment: Pump, type Serial No. <u>131847</u> Power, Kind <u>ELEC.</u> H. P. <u>25</u> N Elec. Meter No. <u>80</u> Yield	e Size of disc Size of disc Make Aotor Serial No. // G.P.M. Pur G.P.M. Pur	≤	Water Analy Water Level Period of Re Collecting A	<i>Ess</i> sis: Min. (1) San. (2 s available: Yes (1) ecord: Begin Agency: (1) Pump Test (2)) H.M. (3) No End
Equipment: Pump, typ Serial No. <u>J31847</u> Power, Kind <u>ELEC.</u> H. P. <u>25</u> N Elec. Meter No. <u>80</u> Yield <u>SK</u>	e	≤	Water Analy Water Level Period of Re Collecting A	<i>Ess</i> sis: Min. (1) San. (2 s available: Yes (1) ecord: Begin Agency: (1) Pump Test (2)) H.M. (3) No End
Equipment: Pump, typ Serial No. <u>J31847</u> Power, Kind <u>ELEC.</u> H. P. <u>25</u> N Elec. Meter No. <u>80</u> Yield <u>SK</u>	e Size of disc Size of disc Make Aotor Serial No. // G.P.M. Pur G.P.M. Pur	≤	Water Analy Water Level Period of Re Collecting A	<i>Ess</i> sis: Min. (1) San. (2 s available: Yes (1) ecord: Begin Agency: (1) Pump Test (2)) H.M. (3) No End
Equipment: Pump, typ Serial No. <u>J31847</u> Power, Kind <u>ELEC.</u> H. P. <u>25</u> N Elec. Meter No. <u>80</u> Yield <u>SK</u>	e	≤	Water Analy Water Level Period of Re Collecting A	<i>Ess</i> sis: Min. (1) San. (2 s available: Yes (1) ecord: Begin Agency: (1) Pump Test (2)) H.M. (3) No End
Equipment: Pump, typ Serial No. <u>J31847</u> Power, Kind <u>ELEC.</u> H. P. <u>25</u> N Elec. Meter No. <u>80</u> Yield <u>SK</u>	e	≤	Water Analy Water Level Period of Re Collecting A	<i>Ess</i> sis: Min. (1) San. (2 s available: Yes (1) ecord: Begin Agency: (1) Pump Test (2)) H.M. (3) No End
Equipment: Pump, typ Serial No. <u>J31847</u> Power, Kind <u>ELEC.</u> H. P. <u>25</u> N Elec. Meter No. <u>80</u> Yield <u>SK</u>	e	make harge pipe <u>10</u> in <u>5. E.</u> <u>HUG918274</u> former No mping levelft	Water Analy Water Level Period of Re Collecting A	<i>Ess</i> sis: Min. (1) San. (2 s available: Yes (1) ecord: Begin Agency: (1) Pump Test (2)) H.M. (3) No End
Equipment: Pump, typ Serial No. <u>J31847</u> Power, Kind <u>ELEC.</u> H. P. <u>25</u> N Elec. Meter No. <u>80</u> Yield <u>SK</u>	e	Emake harge pipe _/Oin S. E. /////69/827// former No mping levelft.	Water Analy Water Level Period of Re Collecting A	<i>Ess</i> sis: Min. (1) San. (2 s available: Yes (1) ecord: Begin Agency: (1) Pump Test (2)) H.M. (3) No End
Equipment: Pump, typ Serial No. <u>J31847</u> Power, Kind <u>ELEC.</u> H. P. <u>25</u> N Elec. Meter No. <u>80</u> Yield <u>SK</u>	e	Emake harge pipe _/Oin S. E. /////69/827// former No mping levelft.	Water Analy Water Level Period of Re Collecting A	<i>Ess</i> sis: Min. (1) San. (2 s available: Yes (1) ecord: Begin Agency: (1) Pump Test (2)) H.M. (3) No End
Equipment: Pump, typ Serial No. <u>J31847</u> Power, Kind <u>ELEC.</u> H. P. <u>25</u> N Elec. Meter No. <u>80</u> Yield <u>SK</u>	e	Emake harge pipe _/Oin S. E. /////69/827// former No mping levelft.	Water Analy Water Level Period of Re Collecting A	<i>Ess</i> sis: Min. (1) San. (2 s available: Yes (1) ecord: Begin Agency: (1) Pump Test (2)) H.M. (3) No End
Equipment: Pump, typ Serial No. <u>J31847</u> Power, Kind <u>ELEC.</u> H. P. <u>25</u> N Elec. Meter No. <u>80</u> Yield <u>SK</u>	e	make harge pipe <u>10</u> in <u>5. E.</u> <u>HUG918274</u> former No mping levelft	Water Analy Water Level Period of Re Collecting A	<i>Ess</i> sis: Min. (1) San. (2 s available: Yes (1) ecord: Begin Agency: (1) Pump Test (2)) H.M. (3) No End
Equipment: Pump, typ Serial No. <u>J31847</u> Power, Kind <u>ELEC.</u> H. P. <u>25</u> N Elec. Meter No. <u>80</u> Yield <u>SK</u>	e	Emake harge pipe _/Oin S. E. /////69/827// former No mping levelft.	Water Analy Water Level Period of Re Collecting A	<i>Ess</i> sis: Min. (1) San. (2 s available: Yes (1) ecord: Begin Agency: (1) Pump Test (2)) H.M. (3) No End
Equipment: Pump, typ Serial No. <u>J31847</u> Power, Kind <u>ELEC.</u> H. P. <u>25</u> N Elec. Meter No. <u>80</u> Yield <u>SK</u>	e	Emake harge pipe _/Oin S. E. /////69/827// former No mping levelft.	Water Analy Water Level Period of Re Collecting A	<i>Ess</i> sis: Min. (1) San. (2 s available: Yes (1) ecord: Begin Agency: (1) Pump Test (2)) H.M. (3) No End
Equipment: Pump, typ Serial No. <u>J31847</u> Power, Kind <u>ELEC.</u> H. P. <u>25</u> N Elec. Meter No. <u>80</u> Yield <u>SK</u>	e	Emake harge pipe _/Oin S. E. /////69/827// former No mping levelft.	Water Analy Water Level Period of Re Collecting A	<i>Ess</i> sis: Min. (1) San. (2 s available: Yes (1) ecord: Begin Agency: (1) Pump Test (2)) H.M. (3) No End

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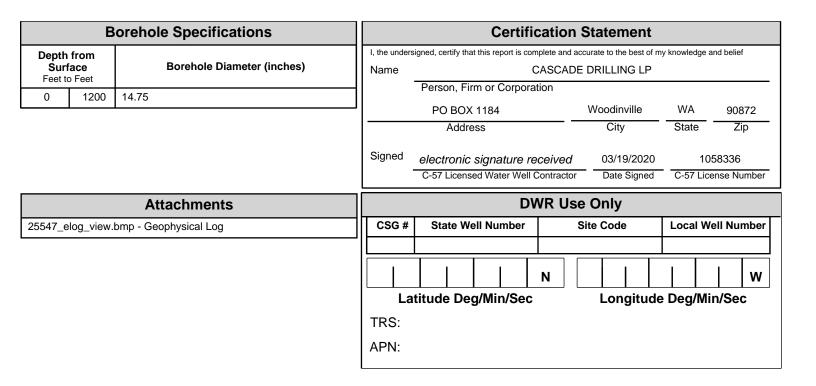
0 	Owner Location 13 Orilled by 0 Date Sept.	WELL L <u>ornia County Colusa</u> 30 ft. north and 375 ft. e <u>Cooper & Son</u> Addu <u>1947</u> Casing diam. <u>14</u> a XXX BR pe of well, perforations, yield Material	Subarea ast of SW cc ess	orner Iand-surf. a	alt.	601
0 	Owner Cocation 13 Orilled by 0 Date Sept. Cource of dat (Enter ty	30 ft. north and 375 ft. e Sooper & Son Addu 1947 Casing diam. 14 a XAX BR pe of well, perforations, yield	ast of SW cc ess	orner Iand-surf. a	alt.	027
ב - ס - 	Drilled by Drilled by Date Source of dat (Enter ty	Cooper & Son Addu 1947 Casing diam. 14 a XAX BR pe of well, perforations, yield	າess	Iand-surf. a	<u>(USGS)</u>	027
- D: D: S:	Drilled by hte Source of dat (Enter ty	Cooper & Son Addu 1947 Casing diam. 14 a XAX BR pe of well, perforations, yield	າess	Iand-surf. a	alt	601
D S	ate Sept. Source of dat	1947 Casing diam. 14 a XXX BR pe of well, perforations, yield	n			601
- S	ource of dat (Enter ty	a XAX BR				601
- S	ource of dat (Enter ty	a XAX BR				
C	·		, and drawdown	at end of		· · · · · · · · · · · · · · · · · · ·
C	orrelation	Matanial			Log)	
		UR CELTET			Thick- ness (feet)	Depth (feet)
-	· · · · · · · · · · · · · · · · · · ·	Soil	· .		5	5
		Clay, yellow Sand and fine gravel		·	15	20
-		Clay, yellow			3	<u>23</u> 31
· -		Clay, sandy brittle	· .		14	45
		Clay, yellow Clay, blue			77 10	122 132
		Gravel Clay, sandy yellow	· · · · · · · · · · · · · · · · · · ·		35	167
		Gravel	<u> </u>	· · · · · · · · · · · · · · · · · · ·	137 22	<u>297</u> 319
· ~ -		Clay, blue			7	319 325
		Gravel Clay, sandy yellow			12 19	338 357
		Gravel			28	385
		Clay, blue		······································	7	392
-		112' of 3/16" x 14	' casing			
		260' of 3/16" x 12 Perf. 104 - 392	' casing			
	······	Rotary type drill				
-		Irrigation	<u> </u>			<u>.</u>
. –					06	
			C	ONFIDENTIAL Valer Coda Soc.	3752	
-		n da genera en la classica y en card en en de 1000 de 2 de 1000 de 2 de 1000 de 2 de 2000 de 2 de 2000 de 2 de	W	later Course		1
-		Plotted and Coded			· · · · ·	+
1		As Well 14N /2W , 13N	<u></u>			+
	·	A CONSTRUCT AND		<u> </u>		+
·	·····			<u></u>		+

State of California Well Completion Report Form DWR 188 Complete 3/19/2020 WCR2020-003773

Owner's Well Num	ber	Date Work Began 07	//08/2019	Date Work Ended	08/07/2019							
Local Permit Agen	cy Colusa County Environmental Health											
Secondary Permit	Agency	Permit Number W	P 1189	Permit Date	07/01/2019							
Well Owner	(must remain confidential purs	uant to Water Co	ode 13752)	Planned Use	and Activity							
Name ARUILL	FARMS, LLC,			Activity New Well								
Mailing Address	Hahn Road			Planned Use Monitorir	ng							
City Arbuckle		State CA Zip	95912									
Well Location												
Address 0 Hal	nn RD		AP	N 018-180-037-000								
City Arbuckle	Zip 95912	County Colusa		wnship 14 N								
Latitude 39	3 14.44 N Longitude	-122 3 3	39.28 W	nge 02 W ction 22								
Deg.	Min. Sec.	Deg. Min.	Sec	ction 22 seline Meridian Mount Dia	blo							
Dec. Lat. 39.05	40111 Dec. Long.	-122.0609111		ound Surface Elevation 84								
Vertical Datum	NAVD88 Horizontal Datu	m WGS84	Ele	evation Accuracy Unknow								
Location Accurac	y 5 Ft Location Determination	on Method GPS	Ele	evation Determination Method	Surveyed							
Borehole Information Water Level and Yield of Completed Well												
Orientation Ver	Orientation Vertical Specify Depth to first water (Feet below surface)											
Drilling Method	Reverse Circulation Drilling Fluid Benton	nite II .	h to Static er Level	(Feet) Date Mea	asurad							
			nated Yield*	(GPM) Test Type								
Total Depth of Bo		Test	Length —	(Hours) Total Dra								
Total Depth of Co	mpleted Well 1050 Feet	*May	not be represen	tative of a well's long term yie	eld.							
	Geolog	gic Log - USCS/A	STM D2488	}								
Depth from Surface Feet to Feet	Soil Class	Soil Color		Soil Description								
0 20	SW Well-graded SAND	Dusky yellow 5Y 6/4	coarse sand; a	and with gravel. About 55% fi about 20% gravel; about 5% f mple dusky yellow 5Y 6/4; coa	ines with low plasticity;							
20 40	CL Lean inorganic CLAY with low plasticity	Yellowish brown 10YR 5/4		n Sand. About 75% fines with edium sand; moist, bulk samp /4								
40 90	CL Lean inorganic CLAY with low plasticity	Yellowish brown 10YR 5/4		nes with medium plasticity; tra vn 10YR 5/4, dark gray streak								
90 110	GC Clayey GRAVEL	Light olive gray 5Y	plastic clay; m	. 60% hard, subangular grave oist, bulk sample multi-colore 6/1; gravel increases and clay	d dark gray N3 and light							
110 160	CH Fat inorganic clay with moderate to high plasticity	Moderate yellowish brown 10YR 5/4		s with medium to high plastici owish brown 10 YR 5/4	ty; trace fine sand; moist,							
160 170	GW Well-graded GRAVEL	Light olive gray 5Y 6/1	colored and da	ravel with Sand. About 70% h ark gray N3 gravel; about 15% l; dry, bulk sample light olive g	6 coarse sand; about							
170 280	CH Fat inorganic clay with moderate to high plasticity	Moderate yellowish brown 10YR 5/4	Fat Clay. Fine 10 YR 5/4	s with high plasticity; moist, m	oderate yellowish brown							

280	300	GW Well-graded GRAVEL	Dark gray N3 and Medium dark gray N4	Well-Graded Gravel w/Sand.75% hard, subangular, multi-colored gray and white gravel; about 15% coarse sand; about 10% medium sand; dry, bulk sample multi-colored, dark gray N3, and medium dark gray N4
300	380	CH Fat inorganic clay with moderate to high plasticity	Light olive gray 5Y 5/2	Fat Clay. Fines with high plasticity; intermittent trace fine sand; moist to saturated, light olive gray 5Y 5/2
380	400	CH Fat inorganic clay with moderate to high plasticity	Dusky yellow green 5GY 5/2	Fat Clay w/Sand. 80% fines with high plasticity; about 10% coarse sand; about 10% medium sand; moist, bulk sample dusky yellow green 5GY 5/2
400	570	CH Fat inorganic clay with moderate to high plasticity	streaks of grayish blue green 5BG 5/2 and dusky yellow green 5GY 5/2	Fat Clay. Fines with high plasticity; moist, grayish olive 10Y 4/2; trace silt from about 500-520'; trace sand from about 550-580'; streaks of grayish blue green 5BG 5/2 and dusky yellow green 5GY 5/2
570	640	SW Well-graded SAND	multi-colored, gray and white	Well-Graded Sand w/gravel. 45% subrounded coarse sand; 35% medium sand;15% hard, subrounded gravel; about 5% fine sand; bulk sample multi-colored, gray and white; coarseness increases with depth
640	780	CH Fat inorganic clay with moderate to high plasticity	light olive gray 5Y 6/1, color change at 730- 780' to dark greenish gray 5GY 4/1	Fat Clay. Fines with high plasticity, light olive gray 5Y 6/1, color change at 730-780' to dark greenish gray 5GY 4/1; trace fine sand; moist
780	890	SW Well-graded SAND	Multi-colored, white, gray, and light brown	Well-Graded Sand with Gravel. About 50% medium sand; about 25% coarse sand; about 15% hard, subrounded gravel, multi- colored, white and gray; about 10% fine sand; bulk sample multi- colored, white, gra
890	920	CL Lean inorganic CLAY with low plasticity	Light olive gray 5Y 6/1 and yellowish gray 5Y 8/1	Lean Clay. Fines with medium plasticity; moist, light olive gray 5Y 6/1 and yellowish gray 5Y 8/1; trace sand.
920	950	SW Well-graded SAND	multi-colored, gray and white	Well-Graded Sand w/Gravel. About 35% coarse sand, multi-colored gray and white; about 35% medium sand; about 20% hard, subangular gravel, multi-colored, gray and white; about 10% fine sand; dry
950	1000	CL Lean inorganic CLAY with low plasticity	light blue gray 5Y 6/1	Sandy Lean Clay. About 70% nonplastic fines; about 20% medium sand; about 10% coarse sand; moist, bulk sample light blue gray 5Y 6/1
1000	1020	SW Well-graded SAND	multi-colored, brown, white, and gray	Well-Graded Sand. About 60% hard, medium to coarse sand; about 40% fine sand; bulk sample multi-colored, brown, white, and gray
1020	1040	SW Well-graded SAND	multi-colored, gray, black, and white	Well-Graded Sand. About 50% medium sand; about 35% fine sand; about 15% hard, coarse sand; moist, bulk sample multi-colored, gray, black, and white
1040	1050	CL Lean inorganic CLAY with low plasticity	pale olive 10 6/2	Lean Clay with Sand. About 80% fines with low plasticity; about 20% medium sand; moist, bulk sample pale olive 10 6/2
1050	1080	SW Well-graded SAND	multi-colored, gray and white	Well-Graded Sand. About 35% medium sand; about 35% fine sand; about 10% hard gravel; about 20% hard coarse sand; moist, bulk sample multi-colored, gray and white
1080	1140	SW Well-graded SAND	multi-colored, white, gray, and light brown	Well-Graded Sand. About 50% medium sand; about 30% fine sand; about 10% hard, subangular gravel; about 10% subangular coarse sand; moist, bulk sample multi-colored, white, gray, and light brown
1140	1200	SW Well-graded SAND	multi-colored, light gray, and white	Well-Graded Sand w/Gravel. About 35% medium sand; about 35% fine sand; about 15% hard, subangular gravel; about 15% coarse sand; bulk sample multi-colored, light gray, and white

Casings												
Casing #		m Surface o Feet	Casing	д Туре	e Material Casings Specificatons Wall Thickness (inches) Screen (inches) Screen (inches) Casings Specificatons Casings Specificatons (inches) Screen (inches)			Description				
1	0	1020	Blank		PVC	OD: 2.375 in. Thickness: 0.218 in.	0.218	8	2.375			
1	1020	1030	Screer	n	PVC	OD: 2.375 in. Thickness: 0.218 in.	0.218	8	2.375	Milled Slots	0.02	
1	1030	1050	Blank		PVC	OD: 2.375 in. Thickness: 0.218 in.	0.218	8	2.375			
2	0	860	Blank		PVC	OD: 2.375 in. Thickness: 0.218 in.	0.218	8	2.375			
2	860	870	Screer	n	PVC	OD: 2.375 in. Thickness: 0.218 in.	0.218	8	2.375	Milled Slots	0.02	
2	870	920	Blank		PVC	OD: 2.375 in. Thickness: 0.218 in.	0.218	8	2.375			
2	920	930	Screer	n	PVC	OD: 2.375 in. Thickness: 0.218 in.	0.218	8	2.375	Milled Slots	0.02	
2	930	950	Blank		PVC	OD: 2.375 in. Thickness: 0.218 in.	0.218	8	2.375			
3	0	580	Blank		PVC	OD: 2.375 in. 0.21 Thickness: 0.218 in.		8	2.375			
3	580	590	Screer	n	PVC OD: 2.375 in. 0.21 Thickness: 0.218 in.		8	2.375	Milled Slots	0.02		
3	590	610	Blank		PVC	PVC OD: 2.375 in. 0.21 Thickness: 0.218 in.		8	2.375			
4	0	290	Blank		PVC OD: 2.375 in. 0.2 Thickness: 0.218 in.		0.218	8	2.375			
4	290	300	Screer	n	PVC	OD: 2.375 in. Thickness: 0.218 in.	0.218	8	2.375	Milled Slots	0.02	
4	300	320	Blank		PVC	OD: 2.375 in. Thickness: 0.218 in.	0.218	8	2.375			
			-			Annular Ma	terial	_				
Śur	from face to Feet	Fill			Fill 1	Type Details		Fi	ilter Pack	Size		Description
0	246	Bento	nite	Non Hy	drated Bentonite)						
246	329	Filter F	Pack	Other G	iravel Pack			8			sand	
329	508	Bento	nite	Non Hy	drated Bentonite)						
508	650	Filter F	Pack	Other G	iravel Pack			8			sand	
650	781	Bento	nite	Non Hy	drated Bentonite)						
781	961	Filter F	Pack	Other G	iravel Pack			8			sand	
961	1007	Bento	nite	Non Hy	drated Bentonite)						
1007	1080	Filter F	Pack	Other G	iravel Pack			8			sand	
1080	1200	Other	Fill	See des	scription.						native fill	
Other	Other Observations:											



RT

LOCATION NOT CHECKED

Do Not Fill In No 44455

[SIGNED].

ORIGINAL File Original, Duplicate and Triplicate with the REGIONAL WATER POLLUTION	(Sections 7076, 7077	RILLERS REP , 7078, Water Code)	ORT	Nº 444	
CONTROL BOARD No. 5	STATE OF C	ALIFORNÍA	Plotte	State Well No. <u>194</u> Other Well No. <u>194</u>	in-29J
		(11) WELL LC	DG: As W		29.51
N A		Formation: Describe by co			<u>ft.</u>
<u>A</u>			8 ft. 81	Top soil	••••••
		8 7	21 " 13"	Dry grave Diant	
(2) LOCATION OF WELL:		21	36 151	Yellow clayer C.	····
County Colusa 7 Owner's number, if any-	-		<u>58 221</u>	Dry gravel	
R. F. D. or Street No. S.E. corner of S.E.	1/4 of Sec. 29		5 71	Yellow clay	
T 14 N. R 2 W.		05	7/ 91	Loose gravel	
		<u> </u>		Yellow clay	
	·····	<u>110 "11</u> <u>115 "12</u>		Loose gravel	
	f	124 " 13		Yellow clay Rocks & gravel	
(3) TYPE OF WORK (check):		138 " 15		Yellow clay	
New well D Deepening Recondition	ning 🗌 Abandon 🗌	153 " 15		Loose gravel	
If abandonment, describe material and procedure in Item	-	156 " 17		Yellow clay	
(4) PROPOSED USE (check):	(5) EQUIPMENT:	177 " 18		Loose gravel	······································
	Rotary 🖈	181 " 20		Yellow clay	
	Cable	201 "20) <u>/; "31</u>	Rocks & gravel	
Irrigation 🕅 Test Well 🗌 Other 🗌	Dug Well 🗌	20/22	<u>20 16</u>	Yellow clay	
(6) CASING INSTALLED:	If gravel packed	22022		Rocks & gravel	
	ii graver paened	22222		Yellow clay	
or Di	ameter from to f Bore ft. ft.	228 23	the second s	<u>Rocks & gravel</u>	
$\frac{\text{From }_{\text{ft. to}} \text{ft. Diam. } \text{Wall}}{0 \text{212 } 12 3/16 }$		238 26		Yellow clay	
		<u>269 ° 27</u> 274 ° 21		<u>Rocks & gravel</u> Yellow clay	
······································	tt (1	<u> </u>		Rocks & gravel	1
	es 68	318 33		Yellow clay	0 (0)
., ., ., ., ., ., .,	rt 44	336 " 33		Rocks & gravel	e o
Type and size of shoe or well ring Siz	ze of gravel: 3/4x 1/211		.6	Yellow clay	C N
Describe joint Butt Welded		34.6 " 34	8. 21	Loose gravel	
		348 39	8 501	Yellow clay	Qim
(7) PERFORATIONS:		398 40		Rocks &gravel	DIA
Type of perforator used Machine cut at fa		62		<u>Blue clay</u>	
Size of perforations 3/16 in., lengt From 22 ft. tn 143 ft. Perf. per		<u> 623 " 62</u>	·	Rocks & gravel	
$\frac{\text{Prom}+2.2 \text{ ft. tn}+2.3 \text{ ft. } \text{Pert. pert. pert. }}{176 \text{ ``} 182 \text{ ``} \text$		<u>626 ° 64</u> 640 ° 64		Blue clay	┉╡╨╝┤──
<u></u>	te st re et	649 " 67		Loose gravel Blue clay	er A
<u> </u>	tt +t +t +t	674 " 68		Rocks & gravel	00 H
- 307.5 319.5 338 to /1	2	680 85		Blue clay	0
<u> </u>		852 85		Rocks & gravel	
(8) CONSTRUCTION:		857 88		Blue clay	
Was a surface sanitary seal provided? TYes A No To what		<u> 882 88</u>	4 21	<u>Loose gravel</u>	
Were any strata sealed against pollution? 🗌 Yes 🔏 No If yes	s, note depth of strata	<u> 884. </u>	6 " 321	Blue clay	
From ft. to ft.		<u> </u>	0 41	Bocks & gravel_	
		<u>920 * 92</u>		Blue clay	
Method of Sealing		Work started 6-8	19 5	6, Completed 6-22-	56 19
(9) WATER LEVELS:		WELL DRILLER'S S			
Depth at which water was first found	ft.	This well was drille my knowledge and beli		sdiction and this report is tru	e to the best of
Standing level before perforating	ft.	-	E.E.LUH	DOKFF	
Standing level after perforating	ft.	(Per	son, firm, or corpora	ition) (Typed or pr	
				326, West Main S	<u></u>
(10) WELL TESTS: See back o	fnage		wood Land	California	

 P_{j+1}^{*}

See back of page (10) WELL TESTS:

Was a pump test made?	🕺 Yes 🗌 No I	fyes, by whom? Bo	Е.	Luhdorff	- -
Yield :	gal./min. with	ft. draw	dow	n åfter	hrs.
Temperature of water		Was a chemical analysis mac	de?	Yes 🔏 No	

Was electric	log made of well?	🗌 Yes	N N
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6,6, Well Driller License No. 123211 Dated Oct. 22 1953. 95689 3-54 50M QUIN (8) SPO DWR FORM NO. 246 (REV. 3-54)

́ В Т Т. а	· · ·	
		H-44455
*		
	Report No / 9.6	
	Owner_	
e se se su con construction de la c	Pump No	สมของสารใส่สุขของการการการสารมาก และ กระบบสารของการของการของการการสารการการการการการการการการการการการการกา
	Meter No. 62.656	
	Region 5; County COLUSA	
	Township 14N Range 2W, Sect	ion 29.11,
	ft. north,ft. west fr	om southeast corner of Section.
	SKETC	н
	WELL O	A N Creck
··· (***	HILLGATE Rd.
	DESCRIPTION OR REL	MARDS .
	hecked by <u>S. Chausber</u>	Date 721-58

tebol ba 18120 19923 e North V ause sint

Francis Ar Break and Arthough a strategy and Results of Well Test as follows: <u>op soil</u> Li ferant vrG VELION CISH ** Mater Level -77' Dry gravel, the Paping level 8 200' 190' 180' Yellow olay Locse ravel vslo wolley Locse stratel. . 115. . 51 0562 1.27 10 BEE <u>14</u> <u>locis & erayel</u>

 136
 14'
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 Sociation e T<u>el</u>lowicley Looce grayel 61 Sellow clerch 222 7 228 101 Focks & gravel 236

236 260 31 Yellow clevel 269 274 31 Tocke & gravel 274 312 38 Tellow clevel 372 318 265 Bocks & gravel 372 318 265 Bocks & gravel 1/6 Start Tocse gravel Hine: dist.

Lovers 92501 251 BIRGER Valo autoria Presidente Presidente Presidente Valo autoria LOOKS & ALOOL

6-22-56

J. dawa

Meter No. Owner H. Pump No. MARCHARD LO BITH . C മന്പാട് 🗧 Totacil) . H. Schielen (O. Dirot A I ANNO 2 ST where a stationar stream t lar (C) -1125 0.P.M. and the second 1050 囊 6 <u>6</u> 6 960 850 . . (Asidon ZROW TO ESTINE):

#44455

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A avairant de service Z Ficto A aldiC F S Jaw 20 J Domessie 🗋 Instation 🗍 Minaleigel 🗋 Irrigation 🗋 Test Well 🗍 Order 20 1 and any far any si . . OBULLEVIL DICEAD (B) Courses Trans พูสัส วาร

L.V. Jours an article

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or at most 0 **8**12 12 gair iles to sent to self his ifel

ERBORATIONS TOIDER STORE OUT OF STORE

to VI2 1 ST COMPACEMENT A. D. Intitite

WWW TESTA See back of an one of the second s

			14	- ۲۸/ <i>3</i> سا ا No.	.14	
ORIGINAL	STATE OF C	ALIFORNIA	Ť	1000	$''_{D_0 n}$	ot fill in
	THE RESOUR	CES AGENCY			0000	\mathbf{O}
File with DWR	DEPARTMENT OF W	ATER RESOUR	CES	NO.	2003	2
Notice of Intent No	WATER WELL DI	RILLERS REPO	DRT	CL.L. W. D. W. P	S	
Local			. •	Other Well No	NFIDEN	TAI
`				Other Well No.	Ter Code S	14 LOG
(1		(12) WELL LO	G: Total depth	704 ft. Depth of c	ompleted well	685752
Ad				by color, character		
Cit	6	0 10	top soil	L		
(2) LOCATION OF WELL (See instruct	etions): W 2005	10 16	<u>clay</u>		·	
CountyOwner's	Well Number	<u> 16- 26</u>	gravel			
Well address if different from above		<u>26-</u> 28 28-38	clay	<u> </u>		
TownshipRange	hn-Cortina Sch.	28- 38 38- 56	gravel Cray	\bigvee		
Distance from cities, roads, railroads, fences, etc		56- 64	gravel	•		
Rd 1 mi. W 50' N		64- 68	clay			
		68 80	gravel			
	(3) TYPE OF WORK:	80-082	Clay			
	New Well X Deepening	82, 98	gravel			
	Reconstruction	98-102	clay	·····		
	Reconditioning	102-110>	sand	· · · · · · · · · · · · · · · · · · ·		
	Horizontal Well	110-124	sandy e.	lay		
	Destruction [] (Describe destruction materials and	120	CTER	0		
	procedures in Item 12	179-199	clay	and		
	(4) PROPOSED USE	182-102	sandy a			
	Domestic	190-195	clav	have		
	Irrigation	195-203-	sand O	~		
	Industrial	×205-214	clay			
~	Toot Well	220 (sand			
	Stock	220-226	\&]ăy			
WELL LOCATION SKETCH	Municipal Other	226-242	sand			
(5) EQUIPMENT: (6) GRAVE	< <u> </u>	242-205	clay			
Botany D Revenue X No.	sin plea goav.	200-2/5	sand	i sandy cl		
Cable Air Danneter of b	24"	392-398	sand	i sanuy ci	ay	
Other 🛛 Bucket 🗆 Racked rom_	0 5 704 <u>+</u>	98-521		l sandy cl	องซ	·-·····
(7) CASING INSTALLED (8) PERFOR	ATTONS:	\$ 521-536	gravel		0	
Steel Plastic Concrete Type of period	ration of screen	9 536-548	lay			
From To Dia. Case or Frence	To C Star	<u>548-555</u>	sand			
ft. ff. Vin. Wall ft	ft. size	555-564	clay			
0- 685 16 0Dx . 250 390		564-581	gravel	<u>670-678</u>	<u>sand</u>	······
500.	- 500	581-624	<u>clay</u>	678-704	<u>lay</u>	
	-689///	636-645	<u>gravel</u>			
(9) WELL SEAL: Was surface sanitary seal provided? Yes □ No □	If yes, to depthft.	645-663	<u>_clay</u> 			
	$o \square$ Intervalft.	663-870	elay			
Method of sealing		Work started	19	Completed7	18	_19_77_
(10) WATER LEVELS:		WELL DRILLER'S		· · · · · · · · · · · · · · · · · · ·		
Depth of first water, if known		This well was drilled u knowledge and belief.	ınder my jurisdicti	on and this report i	s true to the	best of my
Standing level after well completion(11) WELL TESTS:	ft.	SIGNED F. M	. Eaton			
Was well test made? Yes 🗌 No 🗍 If yes, b				Driller)		
Type of test Pump □ Bailer □ Depth to water at start of testft.	Air lift [] At end of testft	NAMECa 'or		ation (Typed or pi		
Dischargegal/min_afterhours	Water temperatureft	Address 20 ne	and by te	• U	2101	- wa
gar/min arernous		1 Woodland	d, Calife	prnia		95

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM 43816-950 7-76 50M QUAD ()T OSP DWR 188 (REV. 7-76)

Chemical analysis made? Yes
No
If yes, by whom?

e log made? Yes 😰 No 🗆 If yes, attach copy to this report

Wai

City.

License No.

133783057

Zip_

Date of this report.

-18-

			2.0	SW- 24
ORIGINAL	STATE OF C			۵
		CES AGENCY		Do not fill in
File with DWR	DEPARTMENT OF V	VATER RESOUR	CES	No. 072290
Notice of Intent No	WATER WELL D	RILLERS REPC	ORT	
Local Permit No. or Date				State Well No.
-		· · · · · · · · · · · · · · · · · · ·		Other Well No.
((12) WELL LO	G: Total depth	20ft. Depth of completed wellft.
A		from ft. to ft. For	mation (Describe	by color, character, size or material)
C		0 = 4	top soi	
(2) LOCATION OF WELL (See instru-	ctions): W-3649	4 = 20 20 = 34	gravel	
CountyOwner's	Well Number	34= 80	clay sand an	d gravel
Well address if different from above	Sec. 24	80-204	stratas	
TownshipRange	Section		stratas	
Distance from cities, roads, railroads, fences, etc.	hn-Cortine	204-214	ghavel	
- acare part 100 0	0 / 60 5	214-266		d sandy clay
		266-274	gravel	-
	(3) TYPE OF WORK:	274-284	kandy c	lay
	New Well 👷 Deepening 🗌	284-288	sand	
	Reconstruction	204-24	<u>cray</u>	
	Reconditioning	210-320		d sandy clay
	Horizontal Well	///	<u>C</u>	a sundy city
	Destruction (Describe destruction materials and	<u> </u>	<u> </u>	
	procedures in Item 12			Rik
	(4) PROPOSED USE Domestic	$e / \bar{\rho} \bar{a}$		
	Irrigation		<u>-</u> D_	<i>b</i>
	Industrial			
	Test Well	-	¥	
	Stock	$\left(\bigcup \right) - \left(\bigcup \right)$	$\langle u \rangle$	
	Municipal			
WELL LOCATION SKETCH	Other 🛛	P -90		
(5) EQUIPMENT: (6) GRAVE				
Rotary Reverse 🕱 No.	16 16		· · · · · · · · · · · · · · · · · · ·	
Cable Air Disputer of the Other Bucket Kasket From_	0 312	\mathbb{R}^{2}		······
(7) CASING INSTALLED: (8) PERFOI	RATIONS:			
	ration or size of screen	₽		
From To Dia. Gage or From	To R Star	-		
$ft.$ $ft(\bigcirc in.$ Wall ft	ft. size			
0 312 8 5 8 OD 292	-312 8 rows			
X_28 8	xxx25 mesh	-		· · · · · · · · · · · · · · · · · · ·
	$ \langle M \rangle_{L}$	-		
(9) WELL SEAL: Was surface sanitary seal provided? Yes D No D	If yes, to depthft.			
	[o] Intervalft.			
Method of sealing		Work started	19	Completed 4-10-81 19
(10) WATER LEVELS:		WELL DRILLER'S		
Depth of first water, if knownStanding level after well completion		This well was drilled un knowledge and belief.	nder my jurisdicti	on and this report is true to the best of my
(11) WELL TESTS:	π.	SIGNED	·	
Was well test made? Yes D No D If yes, h			(Well	Driller)
Type of test Pump Bailer Dep water at start of testft.	Air lift [] At end of testft	NAME Eaton	on, firm, or corpor	ation) (Typed or printed)
Disch	Water temperature	Address P. U. B	OX 975 (20 w. Kentucky)
Chemical analysis made? Yes 🗌 No 🗌 If yes, b	oy whom?	City	d, Calif	
Was electric log made? Yest No I If yes, at	ttach copy to this report	License No. 13378		Date of this report 4-21, 1981

DUC NOLE DWR 188 (REV. 7-76) IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

2		<i>2</i>		
2,5	ORIGINAL	WAT	ER WELL D	RILLERS REPORT Do Not Fill In
	File With DWBIDENTIAL LOG		(Sections 7079, 7080, 7	(081, 7082, Water Code)
	Water Code Sec. 137	52 THE R	ESOURCES AG	ENCY OF CALIFORNIA Nº 12982
7		DEP	ARTMENT OF V	NOS 12982 ENCY OF CALIFORNA OF CONFIDENTIAL Well No. NATER RESOURCES
	(1) OWNER:		1	(11) WELL LOG:
	Name alusa, (ii)	unty	aupon	Total depth 140 ft. Depth of completed well 140 ft.
	Address A			Formation: Describe by color, character, size of material, and structure
	(2) LOCATION OF WELL:	aliq	ə	10 20 Dendy musk
		Owner's number, if a	ny	30 30 Clay-
	Township, Range, and Section	· · · · ·		30 50 travel & Land
	Distance from cities, roads, railroads, etc.		·	55 12 band & Gravel
	(3) TYPE OF WORK (check			72 135 Blue Clay
	New Well Deepening Recor If destruction, describe material and proced		Destroying 🔲	135 140 Black Sand
	(4) PROPOSED USE (check)	: (5)	EQUIPMENT:	
	Domestic Industrial I Munic Irrigation I Test Well O		otary 🗌 Ible 🖉	
			ther	OThis Well is located at
	(6) CASING INSTALLED:	If an	vel packed	The Min have the Maline
	STEEL: OTHER:	II gia	iver packed	and mapping the contains
		Diameter	1	
	From To or ft. ft. Diam. Wall	of Bore	From To ft. ft.	
	0 75 8" 134			
í				
	Size of shoe or well ring: 21428	Size of gravel:	ii	
	Describe joint DIW			
	(7) PERFÓRATIONS OR SCI Type of perforation or name of screen	XEEN:		
	Perf.	Rows		
	From To per ft. ft. row	per ft.	Size in. x in.	
			······	
			s 	· · · · ·
	· · · · · · · · · · · · · · · · · · ·			
				Plotted and Coded
	(8) CONSTRUCTION: Was a surface sanitary seal provided? Yes No D To what depth ft.			As Well 15N / 111 - 5680
	Were any strata sealed against pollution? Yes	No 🗌 🛛 I	f yes, note depth of strata	
	From ft. to ft. From fty to ft.	.		Work started \$ 19 19 71, Completed \$ 20 19 71
	Method of sealing			WELL DRIZLER'S STATEMENT:
	Depth at which water was first found, if known 20 ft. Standing level before perforating, if known ft. Standing level after perforating and developing 20 ft.			This well was drilled under my jurisdiction and this report is true to the best of my knowledge und belief.
				NAME Bequille 9 Don Jump Co.
				(Person, firm, or corporation) (Typed or printed)
	(10) WELL TESTS:	f yes, by whom?		Hidress N. ALASTRAM ADUS -
4	d: tgal/min, with	ft. drawdown aft	er hrs.	[SIGNED] D. [Signed and Compared and Compare
	Vas a chemi Was electric log made of well? Yes No Z	cal analysis made? Y		(Well Driller) 9/24 1071
	was steetine tog made of went- tress I INO	If yes, attach	-opy	License No Dated 19/

SKETCH LOCATION OF WELL ON REVERSE SIDE

á

đ

τ 		#1298
	WATER WELL DRILLERS REPORT	
	FIELD WORK SHEET	
Report No. <u> </u> Owner <u>()////</u> Pump No	A County AIRTORT	
Meter No		
	LOCATION	
Section		
Range		
// C	OWSA	

SHNAI

HIGHWAY

20

feet West from S. E. corner of Section

SACRAMENTO RIVER

 \diamond location not confirmed by our well, I think is behind IL and

4700'

feet North,

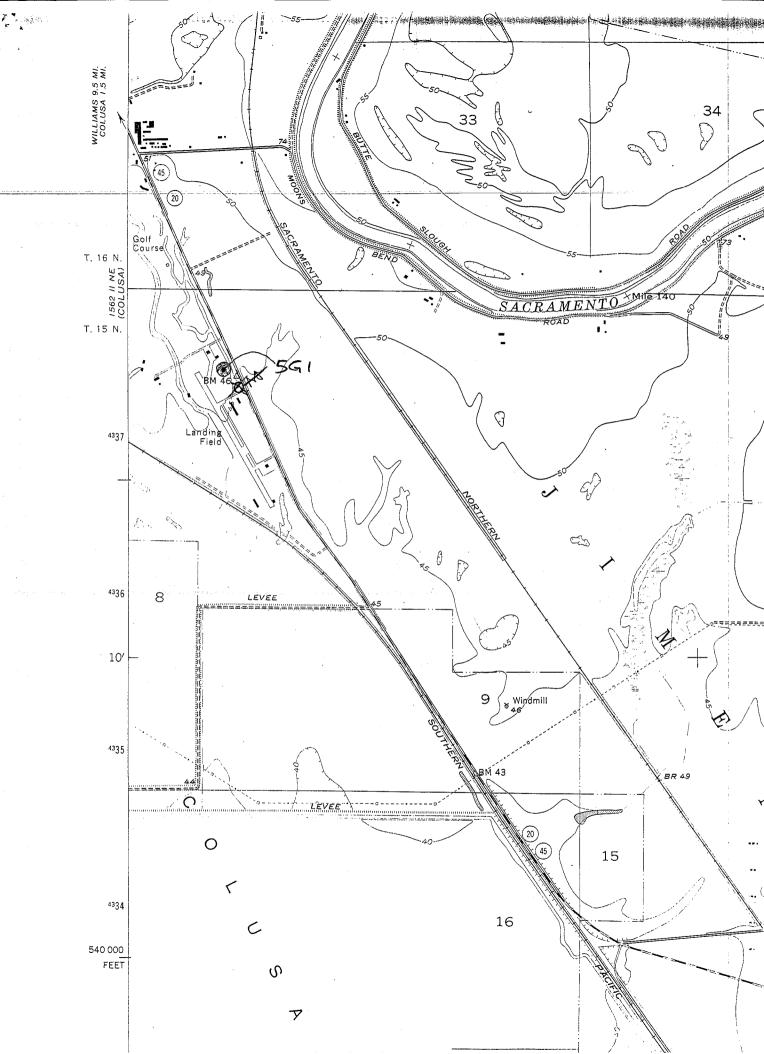
3800

GOLF COURSE

WEL

Ungo Field Checked by

<u>8-13-74</u> Date



.1:-		CALIFORNIA	JUL 1 4 1994 State No
	DEPARTMENT OF	DATA	district Northern
\bigcirc	Qwner Olusa Co. Airport Address Colusa 2915 Awy. 20 - CoLUSA Tenant Coretaker: Connor Davis Address Type of Well: Hydrograph Key Index Location: County Colusa	8	No. <u>15N/Iw</u> -5GI
	U.S.G.S. Quad. <u>Meridian</u> <u>4</u> <u>4</u> Section <u>7</u> , Twp. <u>5</u> <u>6</u> <u>4</u> <u>6</u> <u>6</u> <u>6</u> <u>6</u> <u>7</u>	rt. SF Le an s pumps	Quad. No. <u>545 b</u> <u>SB</u> Base & Meridian Jot Coluse on State HDV aluminum clad P.H. <u>ft.</u>
	Measurements By: DWR USGS USBR County Chief Aquifer: Name Depth to Top Aq. Type of Material Perm. Rating Gravel Packed? Yes No Depth to Top Aq. Supp. Aquifer Depth to Top Aq. Driller Beamer Son Pump Date drilled B/20/2/ Log, filed #/. Equipment: Pump, type Sub make Serial No. Size of discharge pipe in.	Irr. Dist.	Mater Dist. Cons. Dist. Depth to Bot. Aq. Thickness Depth to Bot. Gr. Depth to Bot. Aq. Opent to Bot. Aq. Depth to Bot. Gr. Opent to Bot. Aq. Min. (1) San. (2) H.M. (3) Mailable: Yes (1) Moder Marchine Marchine <t< td=""></t<>
	SKETCH	ELEV. TO TA R.P. WELL FALL of 20	REMARKS OI I SURVEYED IN A ACCURATE HE R.P. FROM USGS B.M., THE CASING HAD BEEN EXTENDED IN DOO. NO ACCURATE RELORD OF THE WAS MADE SO I DID THIS. EWH
<u>_</u>	•	By: <u>P-to</u> Qualification Confidence 1 Water Body: O	CONFOSIFE Semi-Confined DEFINITE FLOODPLAIN NEPOSITS E dn Burn Deposito
		Recorded by:	

WATER WELL DRILLERS REPORT

(Sections 7076, 7077, 7078, Water Code)

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Flie Original, Duplicate and Triplicate with the **REGIONAL WATER POLLUTION** Б

OFGINAL

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7

STATE OF CALIFORNIA

COCATION NOT CHECK Do Not Fill In 71038 No State Well No. 5.1241-19

CONTROL BOARD No	Other Well No/ 3/12W-11
	(11) WELL LOG: Total depth 334 ft. Depth of completed well 334 ft.
<u>Na</u>	
<u>Ac</u>	Formation: Describe by color, character, size of material, and structure. ft. to 3 ft. SOIL
<u> </u>	3 9 Sand and the Propage
(2) LOCATION OF WELLIVES ON Abele Road	9 31 Clay
	31 36 Gravel
County Coluse Owner's number, if any-	<u>36 44</u> Clay
R. F. D. or Street No. 30 feet East from Husted	44 48 Sand
road a short way south from Crawford	48 61 Sandy clay
road in the Northwest 1/4 of Section	61 62 Gravel
19, Township 15 North, Range 2 West,	62 161 Clay
M.D.B. & M.	161 168 Brittle
(3) TYPE OF WORK (check):	168 181 Gravel
New well 🎩 Deepening 🗌 Reconditioning 🗌 Abandon 🗌	181 198 Clay
If abandonment, describe material and procedure in Item 11.	198 206 Sand, some fine gravel
(4) PROPOSED USE (check): (5) EQUIPMENT:	206 261 Clay
Domestic 🗌 Industrial 🗌 Municipal 🔲 Rotary 🙀	261 264 Sand
Invigation F Test Well Other Cable	<u>264 271 Clay</u>
Dug Well	271 273 Clay with fine gravel
(6) CASING INSTALLED: If gravel packed	_273 _ 291 Clay
	291 294 Brittle with fine gravel
From ft. to ft. Diam. Wall of Bore ft ft.	294 311 Clay
0 334 14" 3/16 24" 0 334"	311 329 Gravel
→ 0 12 24* * 28* 0 12 → 1 → 12 → 1 → 1 → 1 → 1 → 1 → 1 → 1 → 1 →	
The 24 inch cemented in	Plotted and Coded
from 12 ft to surface	As Well 11 / 2W - 19580
	As Well / 2W - 19580
Type and size of shoe or well ring Point Size of gravel: 5/8*	
Describe joint all joints welded	" " Soc. C I
(7) PERFORATIONS: standard	Yield of well:
	2750 GPM 90.5 feet
	<u>2115 * 85.0 *</u> 1950 * 82.0 *
From 162 _{(1, 10} 174; 4 pe perf. fetrow 29 Rows per ft.	
	54
	<u>3 minute comeback 22 feet</u>
<u>262 274 4 * * 29</u> 290 294 4 * <u>* 29</u>	
	Perforations continueds
(8) CONSTRUCTION: from surface	
Was a surface sanitary seal provided? # Yes 🗆 No To what depth to 12 ft eft.	310 ft to 314 ft 4 per ft 29 rows
Were any strata sealed against pollution? 🗌 Yes 🕱 No If yes, note depth of strata	314 *** 334 ** 4 ** ** 29 *
From it. to ft.	e
n	(t ' t)
Method of Sealing Cement	Work started May 3 19 62. Completed May 16 19 62
(9) WATER LEVELS:	WELL DRILLER'S STATEMENT:
e	This well was drilled under my jurisdiction and this report is true to the best of
	my knowledge and belief.
Standing level before perforating 16 ft. Tetanding level after perforating 16 ft.	NAME <u>Aulman & Aulman</u> (Ecroon, firm, or corperation) (Typed or printed)
	Address 1309 Westwood Way
(10) WELL TESTS:	Woedland, Calif.
Was a pump test made? X Yes D No If yes, by whom? W.P.Wilson&Sons	HER. Comes
Yield: See 11 gal./min. with ft. draw down after ? hrs.	[SIGNED] Well Driller
Temperature of water ? Was a chemical analysis made? 🗌 Yes 🕱 No	License No. 109870 Dated 7/1/61
Was electric log made of well? [] Yes 🌋 No	in a state i State in a state in a st
*.	57025 5 19 2011 A SPO DWR 188 (REV. 2-24)

WATER WELL DRILLERS REPORT

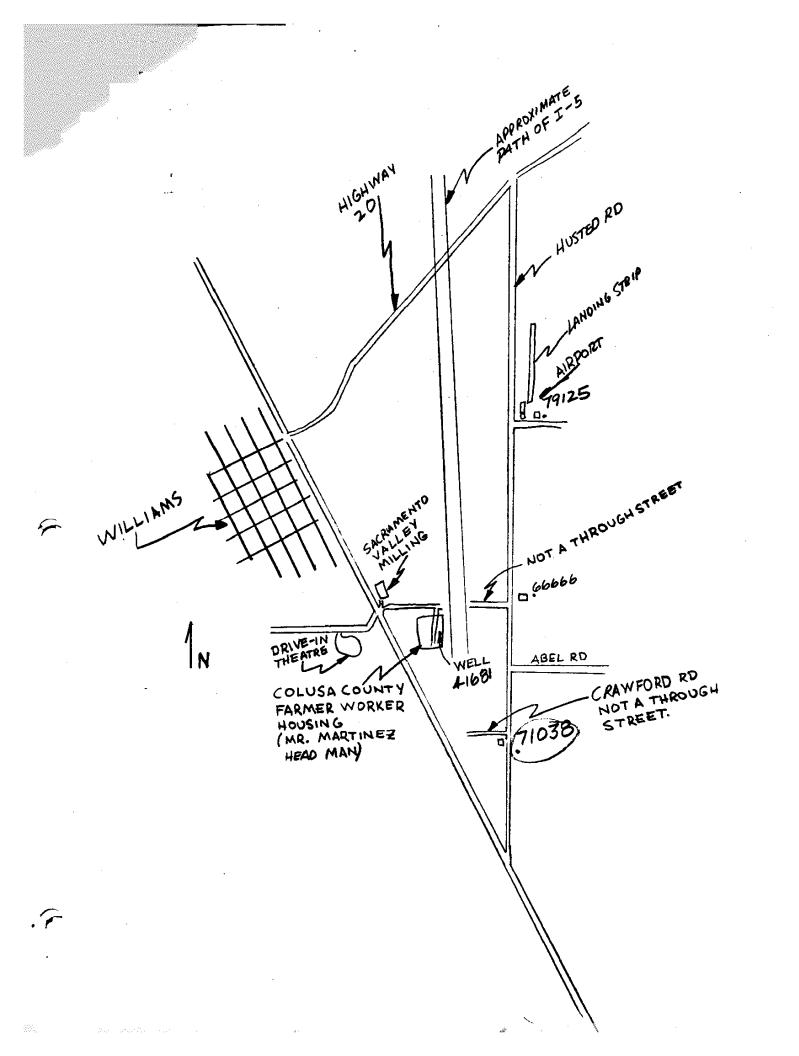
FIELD WORK SHEET

Report No.	71038	
Owner		
Pump No	1275316	
Meter No.	NONE	

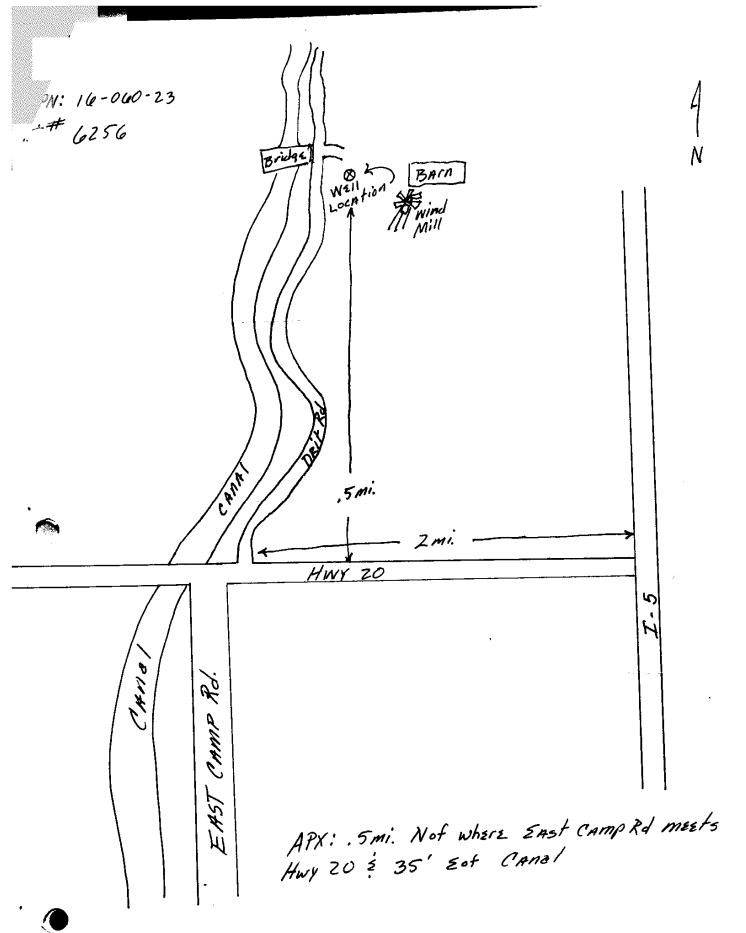
 \sim

I. I	LOCATION
Section 19E	
Township 15N	
Range 2W	
Range	
el cou	
for the	
5 OF ZWE	
	feet North,
APARTMENT-LOOKING BUILDING	feet West from S. E. corner of Section
	REMARKS
measurable by small h	de north side - no PGIE
neter number - ma	the not being used
) 0

Field Checked by <u>B-15-74</u> Date



		AL th DWR		RE	CC	E 1	VED WELL	STATE	OF CALII DI ETI	TORN	JIA J REPOR	т [ASE ONL	<u>, n</u>	TORM
				M		n 5	1003	1(0)01 10 11		1 10 1			<u> </u>	STATE		D./STATION NO.
	Owner's	1 of1	6256	101	-			N	•. 49	32	125					
	Date Wo – Local	ork Began . Permit Ag	$\frac{11/30}{COMPARENT COMPARENT COMPARENTA COMPAREN$	<u>179</u> 0111	Z D .	₩,	ENVIRON	13/92 Imenta	L HE	ΔT.3	гн			-	<u> </u>	
AL							Permit								APN/TR	S/OTHER
			v						- ·		<u></u>		WELL	OWNEI	R —	
	ORIENTA	TION (∠)					CONTAL AN									
		H FRÓM RFACE		I IO F			SCRIPTION	DELOW SU	RFACE							
		to Ft.	ļ			mate	rial, grain size, co	lor, etc.		-				OUALL		
	0		TOP S	<u>301</u>	L						dress <u>.5</u> y <u>35'</u>				RD	<u>& HWY 20</u>
	30		GRAVI	EL.				• • •			y33 untyCOL		F CANA	L		
	85		CLAY		OME	S	AND			АР	N Book 16	Pa	ge 060	Parcel	23	
	88				AND	<u>Y (</u>	GRAVEL	· · ·		То	wnship <u>10</u>	<u>//</u> Ra	$mge _ UVV$. Section	08	
	130 250		CLAY		OST	LY	CLAY			La	titude				ude_	L L WEST DEG. MIN. SEC.
				<u> </u>			CMAI	· · · · · · · · · · · · · · · · · ·	· · · ·		LOO		ON SKETCH	I <u> </u>		ACTIVITY (∠) — X New Well
	<u> </u>						· · · · · · · · · · · · · · · · · · ·									MODIFICATION/REPAIR
			, , , ,													Deepen
								<u>.</u>								Other (Specify)
							-									DESTROY (Describe
																Procedures and Materials Under "GEOLOGIC LOG")
			•							WEST					EAST	- PLANNED USE(S) - (<u>(</u>) MONITORING
		1								>					-	WATER SUPPLY
		• •	t 1 9													Domestic
· · · ·																Public
• 8		1 1 1) 													X Irrigation
			r													"TEST WELL"
	[• • •	1 L I								· · · · · ·	so	JUTH			CATHODIC PROTEC-
		1 1	1 1 1							รบ	ustrate or Descri ch as Roads, Bui	ibe Dista ildings, I	ince of Well fro Pences, Rivers, e	tc.	uarks	OTHER (Specify)
			 								LEASE BE ACC					
		1 F 1	 							ME	THOD REV					NATER
			1 7								TH OF STATIC	>	.L& IIELD (Ft.)& D			
			• • •								TER LEVEL					
	TOTAL I	DEPTH OF	BORING	360		Feet 3 5					ST LENGTH					
	TOTAL 1	DEPTH OF	COMPLET	ED W	ELL _	300	(Feet)			* N	lay not be repre	esentativ	e of a well's lo	ng-term y	nield.	
		РТН	BORE-				C	ASING(S)					DEPTH	A	NNU	LAR MATERIAL
	FROM	SURFACE	HOLE DIA.		<u>토(스)</u> 탄 평양		MATERIAL /		GAUG		SLOT SIZE		DM SURFACE	- CE-	BEN-	
	Ft.	to Ft.	(Inches)	BLANK	CON		GRADE	DIAMETER (Inches)	OR WA		IF ANY (Inches)	Ft.	to Ft.	MENT	TONITE	FILL FILTER PACK (⊥) (TYPE/SIZE)
	ł	140	28"	X		_	STN-135	12-3/4	.250				20	X	<u>`</u>	SAND SLURRY
	140	250	22"	X	++	_	STN-135	10-3/4	.250			20	150			X 6X16 SAND PACK
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		ADDITIONAL	INFORMATI					7 M C	ORIZED REPRE	SENT/				DATE SIGNE	- / • •	C-57 LICENSE NUMBER
	DWR 188 RE	V. 7-90		IFA	UDITI(JNAI	L SPACE IS N	ieeded, u	SE NEXT	co	NSECUTIVELY	Y NUMI	BERED FORM	1		



NOT STATE OF CALIFORNIA ORIGINAL 0300-2 WELL COMPLETION REPORT ⊿ File with DWR ATE WELL NO./STATION NO Refer to Instruction Pumphlet Page 1 _ of _ NO3620000111 № 802508A. Owner's Well No. 15 LATITUDE LONGITUDE Date Work Began Ended. Local Permit Agency APN/TRS/OTHER Permit Date Permit No. GEOLOGIC LOG _ ANGLE _____ (SPECIFY) ORIENTATION (∠) VERTICAL _____ HORIZONTAL _ DRILLING FLUID -METHOD DEPTH FROM SURPACE DESCRIPTION Describe material, grain size, color, etc. £1. to F1 WELL LOCATION Address Star 2 Course 11 Car Start - Ca Vi albein Britter 12 Car Lut Aria de S 2 C.J.S. County Coluson 10 1 Sin the las Township 150 Page. Bri Parcel 2.64 Vill Bra $\Box D$ 40 _Range _ Section 10 So end be and State and 46 NORTH WEST Longitude. Latitude_ 100 12 × 542 + 54 DEG. MIN. SEC. DEG. MIN. SEC. Brok La £ allan Bra LOCATION SKETCH ACTIVITY () AL NEW WELL - NORTH Yellow Por Ch, Hugharowy eles MODIFICATION/REPAIR Sail d. 6.6 6 4. 6.1 Doopen K.4. lay Yellow Brin _ Other (Specify) AD GL, Wer GANDOP MA 2 DESTROY (Describe Procedures and Malérials lb120 ĨØ 180 Procedures and Malerials Under "GEOLOGIC LOG") SH Ora PLANNED USES (∠) 1-001 (DAZ 38 WATER SUPPLY Yell Ben. *إراع في* inf f Clay Domestic Public 1 Irrigation Industrial Car at 1: En 14 Selence £, EAST MONITORING X Vell. Pras l lo I in the TEST WELL Ell Bras M CATHODIC PROTECTION Mel HEAT EXCHANGE IORK DIRECT PUSH 800 Olar - Gray 11tt INJECTION VAPOR EXTRACTION SPARGING 51 Gercan Com 220 SOUTH REMEDIATION Illustrate or Describe Distance of Well from Roads, Bulldings, Fences, Riers, etc. and attach a map. Use additional paper if necessary, PLEASE BE ACCURATE & COMPLETE. Clay Olar Grass OTHER (SPECIFY) Greef MAL 7. < ALS M Olive Sand Greenlets WATER LEVEL & YIELD OF COMPLETED WELL la rec 5 لإمبرني s.fc , (FI.) BELOW SURFACE C 1295DEPTH TO FIRST WATER 280 DEPTH OF STATICA 16.64 DEPTH OF STATICA 16.64 WATER LEVEL 8 15.64 FL) & DATE MEASURED Ć. Cons 203 350 جا المحتمل Core. ESTIMATED YIELD . _____ (GPM) & TEST TYPE TOTAL DEPTH OF BORING 620 (Feet) TEST LENGTH _2 (His.) TOTAL DRAWDOWN _ C. (FI.) TOTAL DEPTH OF COMPLETED WELL 420 (Free) * Muy not be representative of a well's long-term yield. ANNULAR MATERIAL DEPTH FROM SURFACE CASING (8) DEPTH FROM SURFACE BORE TYPE TYPE (⊥) HOLE DIA. INTERNAL SLOT SIZE CON-DUCTOR FILL PIPE GAUGE CE-BEN-FILTER PACK (TYPE/SIZE) MATERIAL / SCREEN BLANK IF ANY MENT TONITE FILL DIAMETER GRADE (Inches) 10 Ft. Ft. THICKNESS (inches) Fl. Ft. (Inches) (ビ) ło (三) (上) 20 Ser. مسرفه O 0 150 A 25 29 يتمع وتنا Ċ Ŋâ 1425 150 Ż 82 Ant 620 42a Em 14 <u>av</u> 1 524 80 Pri 50 1× S Cc7. 0 30 È. C 020 ť ا يكوروا ا 10 80 X εl 61 61 () 11 1800 Same 6.8 90 10h M CERTIFICATION STATEMENT ATTACHMENTS (∠) I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief. Geologic Log E ce loratio NAME LE OL Ò. Well Construction Diagram (PERSON, FIRM, OR CORPORATION) Geophysical Log(s) 0 5 EZ Soil/Water Chemical Analyses CITY ADDRESS Other Signed ATTACH ADDITIONAL INFORMATION. IF IT EXISTS. DRILLER/AUTHORIZED REPRESEN

INVERSE OFFICE LEAST

IF ADDITIONAL SPACE IS NEEDED. USE NEXT CONSECUTIVELY NUMBERED FORM

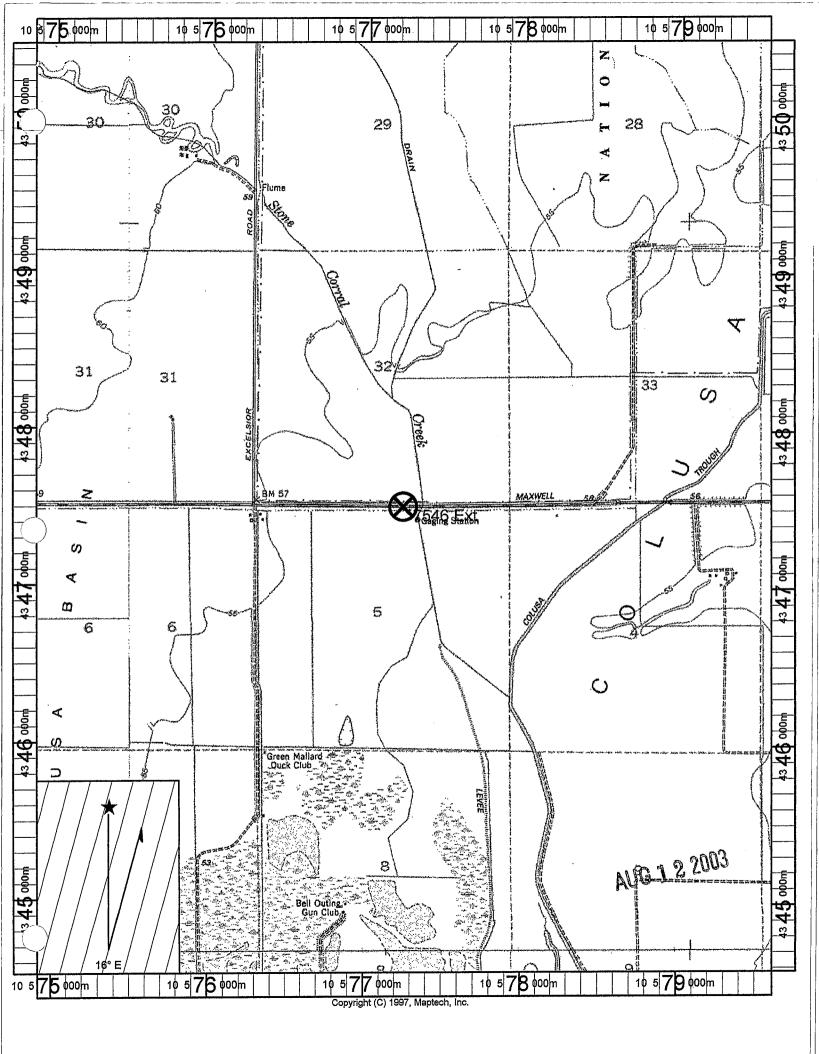
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ATTACH ADDITIONAL INFORMATION, IF IT EXISTS. Signed WELL DRILL'ER/AUTHORIZED REPRESENTATIVE DATE SIGNED C-57 LICENSE NUMBER					Analys			ADDRESS	Mist	+/11-4	L				CITY			STATE	ZIP	
				NFORMATIO	N, IF I			WEL	L DRILLER/A	UTHORIZED					DA					
DWR 188 REV. 11-97 IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM		DWR 188 REV	7. 11-97			IF AD	DITIC	NAL SPACE IS	NEEDED, I	JSE NEXT	CON	SECUTIVELY N	UMBE	RED FC	RM					



16N/2W-25B2 Dote farma 12 Driller in Charge Lanence Rig No Location 21 1721 21 part ne trusconneyer Depth of Hole 274 feet. Size 8 Water Level th of Casing 274 feet. FORMATION: (State every Stratum and Condition) Ċ feet to 54 n feet 84 arane feel to 76 feet fare 5m 84 om 96 feet to 3. 19 feet rom 212. feet to 275 feet From 270 feet to 274 feet From feet to feet feet to _____feet From From _____ feet to feet Remarks: OWNER SALS gener Paners at the

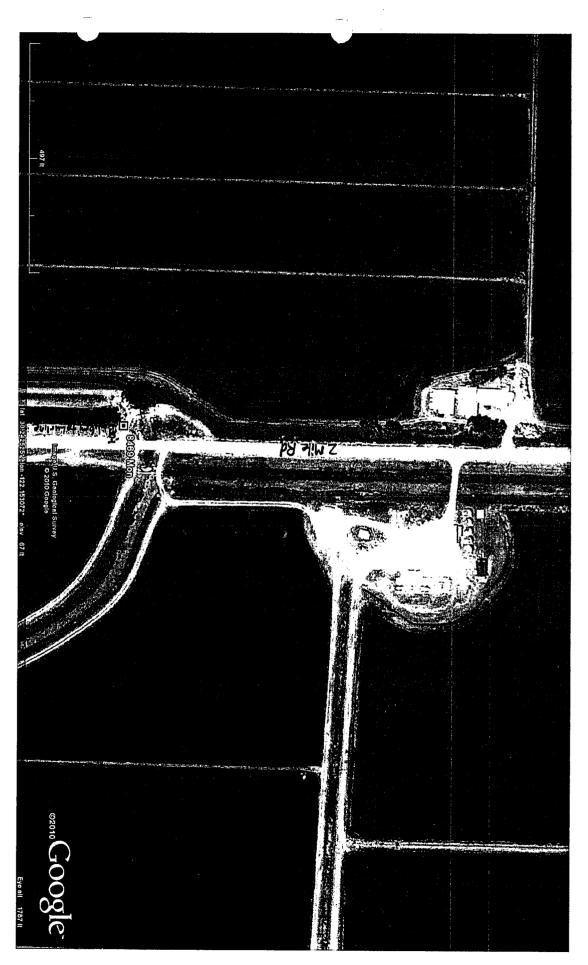
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- 2-1	Yile	Rd	L	h	ell							16n	1/03u	<u>ر</u>	.141	400	3-6M
ORIGINAL File with DWR Page 1 of 4 Owner's Well No Date Work Began Local Permit A	8/16/20	Colus	a	Coi	, Eı		COMP Refer to Ir No 2010	o. E01	01 Pa 11	N REP	OR			// _ ⊑		D./ STA	
Permit No. V	VP00000		DL	OG	IC L	DG Permit	Date _ 8/1	0/2010						A	PN/TRS	UINER	
ORIENTATION (⊥) DEPTH FROM SURFACE Ft. to Ft.		ERTIC/ G RC D RC	λι.)ΤΑ	ARY	HORIZ	ONTAL	LUID <u>MUD</u>) -								
	Top so		<u>/n (</u>	clay	with	small grav	vol stroak			Address 30'			261261	Mī No	f _		
						and streak		5		City Lurline County COL					···· 、		
	Sanda									APN Book Q			210	Parce	1 <u>005</u>		
	Sandy			-						Township 16				Sectio			
	Black Blue cl		WE	tn g	ravei				- 1	Latitude	. I	I MIN. SE	ic.		-	DEG.	MIN. SEC.
	1	<u>~y</u>							-			CATION	SKETCH-			A	CTIVITY 🕑 —
	1 3 4 4 4	*				· · · · ·			-			NORTH				морі	NEW WELL FICATION/REPAIR Deepen Other (Specify)
	1 1 1 1 1 1 1 1								-	_						PLA WATE	DESTROY (Describe Procedures and Materials Jnder "GEOLOGIC LOG" NNED USES (∠) R SUPPLY
	f f f f f f f									MES					EAST	'	Domestic Public migation Industrial MONITORING TEST WELL DIC PROTECTION
	 			•			· · · · · · · · · · · · · · · · · · ·		-								HEAT EXCHANGE DIRECT PUSH INJECTION OR EXTRACTION SPARGING
 	t t t									Illustrate or Desc Fences, Rivers, etc necessary. PLEA	. and	attach a map	from Roads, Use additiona	al paper		(REMEDIATION
1	I I I					· · .		,				R LEVEL					WELL
1 1 1 1 1	1 1 1 1								-	DEPTH TO FIR DEPTH OF STA WATER LEVEL	TIC		(Ft.) & DATE	MEASL	JRED _		
TOTAL DEPTH OF	BORING	150	0	(Feet)	- 				ESTIMATED YI							
TOTAL DEPTH OF	COMPLE	TED	WE	ELL_	<u>44Ó</u>	(Feet)				May not be							
DEPTH						Ċ	ASING (S)		_						ANNI	ILAD	MATERIAL
FROMSURFACE	BORE - HOLE		25	<u>(∕)</u>	J				-			DE FROM S	JRFACE				PE
Ft. to Ft.	DIA. (Inches)	BLANK		DUCTOR		MATERIAL / GRADE	INTERNAL DIAMETER (inches)	GAUGE OR WAL THICKNE	LL	SLOT SIZE IF ANY (Inches)	€ 	Ft. 1	o Ft.	CE- MENT (⊻)	BEN- TONITI (<u>√</u>)	E FILL (⊻)	FILTER PACK (TYPE/SIZE)
Zone 1 0; 295	14		+		P\	/C	2.5	SCH	80	n	[160		✓ :		~	Sand Slurry
295 305	14		1		-	/0	2.5	SCH		****	5	<u>169</u> 252	<u>252</u> 270		~		SRI#8 Sand Bentonite Seal
305 315 Zone 2	14	4	Ţ	_	P١	/C	2.5	SCH				270	378			1	SRI#8 Sand
Zone 2 0, 720	14		╉	_		/C	2.5	SCH	80	<u></u>		378	383		~	~	Bentonite Seal
1	IMENTS		_			. .	⊥	0011	50			383 TION STA	475 ATEMENT	[SRI#8 Sand
Geologic		•=•				I, the undersi	gned, certify th ATON DRII	at this repor	rt is	complete and ac					belief.		
Geophysi	cal Log(s)	•				(PER	SON, FIRM, O	R CORPOR		ION) (TYPED O	R PR	•				• -	
Soil/Wate Other	r Chemical	Analy	sis			20 W. Ke ADDRESS	entucky Ave	. \		``		V	Voodland CITY	-		CA STATE	<u>95695</u> ZIP
1	NFORMATIC	ON, IF I						UTHORIZED	DR	REPRESENTATIV			<u>0</u> DA	9/01/1 TE SIGI			C57 A 133783 C-57 LICENSE NUMBER
ATTACH ADDITIONAL INFORMATION, IF IT EXISTS. Signed Well DRILLER/AUTHORIZED REPRESE DWR 188 REV. 11-97 IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECU												UMBERED	FORM				

ORIGINA									STATE	OF CALIFO	OR	NIA			DWR U	SE ON	LY	<u>DO</u>	NOT FILL IN
File with [WELL	COMP		~ -		RT					1	
Page 2 of 4		9460							Refer to Ir			•						O./ STA	TION NO.
Owner's V			10					nded8/27/2	010	EVI		6237		$ \square$					
								lealth Dept							1	<u> </u>	1 1		
Permit	t No W	P00000)85	usc				Permit		0/2010			-			A	PN/TRS	OTHER	
			GI	EO	LO	GI	CL	OG ——					_		-	~**/****	-		
ORIENTAT	'ION (∡)	_ VE	ERTI	CAL		— н	IORIZ	ONTAL	ANGLE	_(SPECIFY)									
		DRILLING	GR	OT	AF	۲Y		FL											
DEPTH I SURFA						1	DES	CRIPTION											-
Ft. to		Top so	Des	cril	be	mat	eria	, grain, size	e, color, ei	tc					** 5-1 -1 - 1 -1				
5				14/r		<u>av 1</u>	with	small grav	ol straak	2		Address <u>30' Wo</u>			d & 1.6	Mi No	f		
660								and streak		3		City Lurline Av		۱ <u> </u>					
1130		Sand a						and birdak	<u> </u>			County COLUS			10				
1230		Sandy									-14	APN Book 014 Township <u>16 N</u>	لــــــــــــــــــــــــــــــــــــ	age <u>2</u>	3.W/	Parce	14		
1350¦	1440	Black s	san				avel					Latitude	1	kange	<u></u>	Sectio	on <u>14</u>		
1440	1500	Blue cl	ay									DEG.		SEC			-	DEG.	040.
		; ; ;									┢			NORTH	KETCH				CTIVITY (⊻) NEW WELL
		1									-								FICATION/REPAIR
├ ──		() [-								Deepen Other (Specify)
		i									-								
		<u>. </u>									-							—	DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG"
		1 1 1									-		•						Under "GEOLOGIC LOG"
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		1 <u> </u>								······	-								HEAT EXCHANGE
											-								DIRECT PUSH
		t									-							VAP	OR EXTRACTION
											Ŀ		s	юлтн -					
		L									- 1	Illustrate or Describe L Fences, Rivers, etc. and	Distanc	e of Well	from Roads, Use addition	Buildings	r, if		REMEDIATION
		l							e			necessary. PLEASE B	E AC	CURATE	& COM	PLETE.			
1	·	1										WATE	R LE	VEL 8	& YIELD	OF CO	OMPL	ETED	WELL
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DECT								C.	ASING (S)										
FROM SUR	FACE	BORE - HOLE	T	YPE	E (⊻	$\overline{\mathbf{x}}$		C.F					FR	DEP OM SU	TH RFACE		ANNU		MATERIAL PE
		DIA. (Inches)		SCREEN	CON-	Bdlo		MATERIAL /	INTERNAL DIAMETER		Ę	SLOT SIZE				CE-	BEN-		
Ft. to	Ft.	(mones)	BLANK	SCR	85			GRADE	(Inches)	OR WAL		IF ANY (inches)		Ft. to	Ft.	MENT (⊻)	TONITE (✓)	E FILL (√)	FILTER PACK (TYPE/SIZE)
720	730	14	1	<i>v</i>				/C	2.5	SCH	80	.035	-	475 [¦]	515		$\overline{\checkmark}$	<u> </u>	Bentonite Seal
730	740						SCH				515	700			~	SRI#8 Sand			
Zone	3											700	710				Bentonite Seal		
0;	1140	10	1 1	ļ		\square		/C	2.5	SCH				710	775				SRI#8 Sand
1140	1150 -1170	10			Ľ_	$\left - \right $		/C /C	2.5 2.5	SCH SCH				775 i 800 ·	800	r 1	v		Bentonite Seal
				Ļ					2.0	001				800 ;	904				SRI#8 Sand
	Geologic	IMENTS Log	(⊻	, ,			٦	I, the undersio	ned, certify th	at this report	t is	- CERTIFICA complete and accurat	TIO	N STA e best of	TEMEN	l' —— dae and	belief		
		struction D	liagra	m				NAME_EA	ATON DRI	LLING CC	<u>.</u>					- 3			
		cal Log(s) r Chemical	Ana	alysis	5			20 W. Ke	son, firm, o ntucky Ave		Aſ	ION) (TYPED OR PR	INTED	•	oodland			CA	95695
	Other						-	ADDRESS	Varh S	5					CITY	9/01/1		STATE	ZIP
ATTACH ADD		FORMATIC	ON, II						L DRILLER/A	UTHORIZED	R				DA				C57 A 133783 C57 LICENSE NUMBER
DWR 188 REV.	NON-ADDITIONAL ENFORMENT OF MERICIPATION ALL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM DATE SIGNED C-57 LICENSE NUMBER 188 REV. 11-97 IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM C-57 LICENSE NUMBER																		

ORIGINAL						STATE	OF CALIFO	ORN	IIA.				<u>.</u> Y	- <u>DO</u>	NOT FILL IN
File with DWR					WELL	COMP Refer to In			REPOR	S T					
Page 3 of 4 Owner's Well No	. 8469								6237			1		<u></u>	
Date Work Began)		 ,	Ended 8/27/2	010		•					- L I		
Local Permit A	gency CO											LL.			
Permit No. W					LOG Permit	Date _ 8/1	0/2010	_		_	WELL (UTHER	
ORIENTATION (∠)					RIZONTAL		(SPECIFY)	•							
DEPTH FROM	DRILLING	ROI	TAR	Y	FL										
SURFACE	j			DE	SCRIPTION										-
Ft. to Ft.	Top soil	536711		iuici i	ui, gruin, size	e, color, el	<i>c</i> .	- ^	ddraeg 30' W(nf (2 Mile Rd & 1.6		£~		-
					th small grav		S		tity Lurline Av						
					sand streak	<u>s</u>	·	- c	ounty COLUS	A					
	Sand and Sandy bl										Page <u>210</u>				
	Black sa	_	_	grav	el				atitude		Range3 W	Sectio	on <u>14</u>		
1440 1500	Blue clay	/						<u> </u>	DEG.	MIN	SEC. ATION SKETCH-		-	DEG.	
	1							┢		IC.F	- NORTH				CTIVITY (🗹)
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[
	 					·									DESTROY (Describe
	t							-						F	Procedures and Materials Under "GEOLOGIC LOG"
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					- 117 MA										DIRECT PUSH
	1 1 1													VAP	INJECTION
1	1 							Ŀ			- SOUTH				SPARGING
										Dist	ance of Well from Roads.			c	REMEDIATION
1	1 1				the adversar			ne	cessary. PLEASE F	BE /	ACCURATE & COMP	LÉTE.			
1	1 1 1										LEVEL & YIELD				WELL
	1 ' 1							-	EPTH TO FIRST EPTH OF STATIC		.TER	Low s	URFACE	•	
								· w	ATER LEVEL		(Ft.) & DATE				
TOTAL DEPTH OF	BORING 1	500		(Fee	t)						(GPM) & 1 (Hrs.) TOTAL DRAW				· · · · · · · · · · · · · · · · · · ·
TOTAL DEPTH OF	COMPLETE	ED W	/ELL	144	<u>Ó</u> (Feet)	4					entative of a well's li				
DEPTH					<u> </u>	ASING (S)				Г			4 5 15 77		
FROM SURFACE		ТҮРІ	<u>: (⁄</u>)							DEPTH FROM SURFACE		ANNU		MATERIAL PE
Ft. to Ft.	DIA. (Inches)	SCREEN	CON-	Bld	MATERIAL / GRADE	INTERNAL DIAMETER	GAUGE OR WAL	.L	SLOT SIZE IF ANY	-		CE- MENT	BEN-		FILTER PACK
				=		(Inches)	THICKNES	SS	(Inches)		Ft. to Ft.	(Y)	(<u>~</u>)	(<u>√</u>)	(TYPE/SIZE)
<u>1170</u> <u>1180</u> 1180 1200	10	\checkmark	$ \cdot $		PVC PVC	<u>2.5</u> 2.5	<u>SCH</u>			\vdash	904 922 922 1005		~	~	Bentonite Seal
Zone 4		-				2.5	30H	00			922 1005 1005 1026		~		SRI#8 Sand Bentonite Seal
0, 1370	8.75	1			PVC	2.5	SCH			F	1026 1078			-	SRI#8 Sand
1370, 1380 1380, 1410	8.75	\downarrow				2.5 2.5	SCH SCH			_	1078 1106 1106 1236		~	~	Bentonite Seal
i	IMENTS (, , , , , , , , , , , , , , , , , , , 		0011			L	ION STATEMENT	·			SRI#8 Sand
Geologic	• –				I, the undersig	ned, certify th	at this report	t is c	omplete and accura	te to	ton STATENEN o the best of my knowled	ge and	belief.		
Geophysi	cal Log(s)				(PERS	SON, FIRM, O		N) (TYPED OR PR	RINT	•					
Soil/Wate	r Chemical A	nalysi	s		ADDRESS	ntucky Ave			•		Woodland Citry			CA STATE	95695 ZIP
ATTACH ADDITIONAL II	VFORMATION,	, IF IT	EXIS	TS.	Signed WEL	L DRILLERIA		D REI			0	9/01/1 TE SIGI			C57 A 133783
DWR 188 REV. 11-97	WELL DRILLER/AUTHORIZED REPRESENTATIVE DATE SIGNED C-57 LICENSE NUMBER														

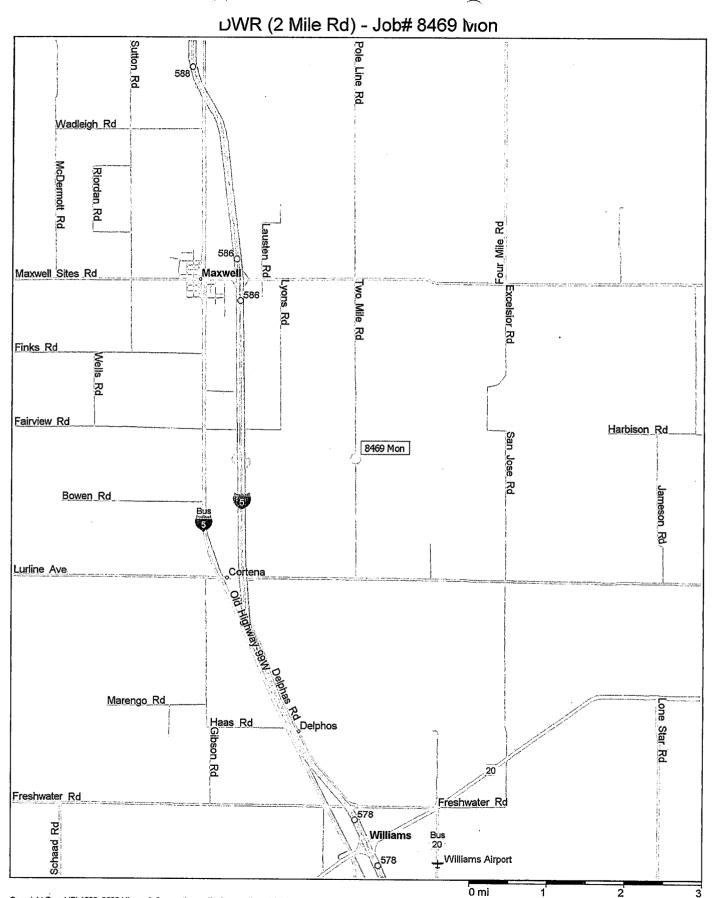
ORIGINAL	STATE OF CAL	IFORNIA DWR USE ONLY - DO NOT FILL IN												
File with DWR		ION REPORT												
Page 4 of 4	Refer to Instruction													
Owner's Well No	No. EU													
Date Work Began	<u>8/16/2010</u> , Ended8/27/2010													
Local Permit A Permit No.	gency Colusa County Health Dept													
Permit No.	VP0000085 Permit Date _8/10/2010													
ORIENTATION (✓)	DRILLING ROTARY FLUID MUD	ΥΥ)												
DEPTH FROM SURFACE	DESCRIPTION	_												
Ft. to Ft.	Describe material, grain, size, color, etc.	·												
	Top soil	Address 30' Wof 2 Mile Rd & 1.6 Mi Nof												
	Sandy brown clay with small gravel streaks	City Lurline Ave CA												
	Sandy blue clay with sand streaks	County COLUSA												
	Sand and gravel	— APN Book 014 Page 210 Parcel 005												
	Sandy blue clay	Township <u>16 N</u> Range <u>3 W</u> Section <u>14</u>												
	Black sand with gravel	Latitude I												
14401 1500		LOCATION SKETCH ACTIVITY (/)												
	1 7 1													
	MODIFICATION/REPAIR Deepen													
	<u>1</u>	Deepen Other (Specify)												
	1													
		DESTROY (Describe Procedures and Materials Linde View 10 (2010)												
1		Under "GEOLUGIC LUG"												
1		← PLANNED USES(∠) WATER SUPPLY												
		Lo Domestic Public 												
I														
<u>!</u>	1 1.	TEST WELL												
1		CATHODIC PROTECTION												
	1 1 1	HEAT EXCHANGE												
i	: : :	DIRECT PUSH INJECTION												
1	t t	VAPOR EXTRACTION												
	l	SPARGING												
i	1	SOUTH REMEDIATION REMEDIATION												
i	1	Fences, Rivers, etc. and attach a map. Use additional paper if necessary. PLEASE BE ACCURATE & COMPLETE.												
!	l	WATER LEVEL & YIELD OF COMPLETED WELL												
	· · · · · · · · · · · · · · · · · · ·	DEPTH TO FIRST WATER (Ft.) BELOW SURFACE												
1	1	DEPTH OF STATIC												
i	1	WATER LEVEL (Ft.) & DATE MEASURED												
TOTAL DEPTH OF	BORING 1500 (Feet)	ESTIMATED YIELD * (GPM) & TEST TYPE												
	COMPLETED WELL 1440 (Feet)	TEST LENGTH (Hrs.) TOTAL DRAWDOWN (Ft.)												
		May not be representative of a well's long-term vield.												
DEPTH	BORE - CASING (S)	DEPTH ANNULAR MATERIAL												
FROM SURFACE		DEPTH ANNULAR MATERIAL FROM SURFACE TYPE												
Ft. to Ft.	(Inches) [문 끮 [이 요] GRADE DIAMETER OR V	ALL IF ANY MENT TONITE FILL FILTER PACK												
		NESS (Inches) Ft. to Ft. (\checkmark) (\checkmark) (\checkmark) (TYPE/SIZE)												
1410 1420		H.80 .035 1236 1261 V Bentonite Seal												
1420 1440	8.75 ✓ PVC 2.5 SC	H 80 1261 1295 SRI#8 Sand												
		1293 1322 Bentonite Seal												
1	┝━━━━┼┼╌┼╼╞╌┼────┼───┼───	1322 1481 SRI#8 Sand 1481 1488 Bentonite Seal												
<u> </u>		1488 - 1500 Native Fill												
ATTAC	$HMENTS (\underline{\checkmark}) = 1$	CERTIFICATION STATEMENT												
Geologic	Log I, the undersigned, certify that this re	port is complete and accurate to the best of my knowledge and belief.												
	nstruction Diagram NAME_EATON DRILLING	CO. DRATION) (TYPED OR PRINTED)												
	er Chemical Analysis 20 W. Kentucky Ave	Woodland CA 95695												
Other	ADDRESS	CITY STATE ZIP 09/01/10 C57 A 133783												
	WELL DRILLER/AUTHORIZ	ZED REPRESENTATIVE DATE SIGNED C-57 LICENSE NUMBER												
DWR 188 REV. 11-97	IF ADDITIONAL SPACE IS NEEDED, USE NE	XT CONSECUTIVELY NUMBERED FORM												



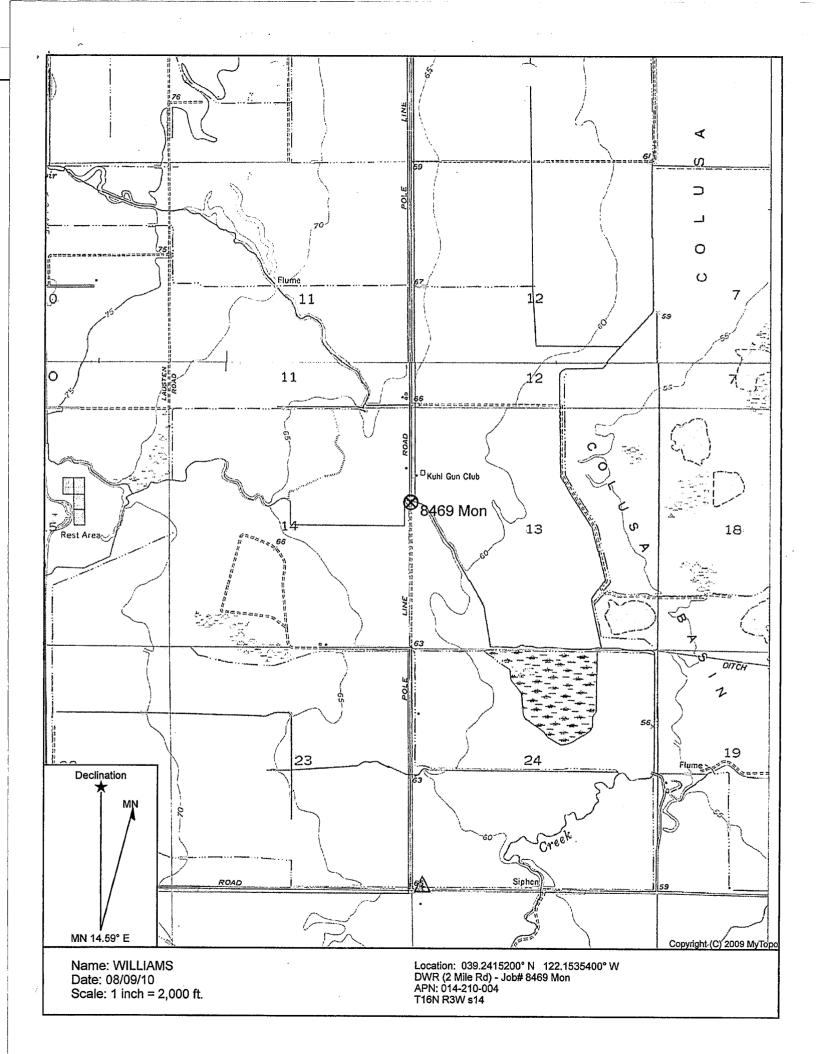
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ORIGINAL

File Original, Duplicate and Triplicate with the

REGIONAL WATER POLLUTION

WATER WELL DRILLERS REPORT (Sections 7076, 7077, 7078, Water Code)

STATE OF CALIFORNIA

LUCATION NOT CHECKE

203

Do Not Fill In Nº: 77484 2ρ State Well No. 5 Other Well No. 16 44 11

CONTROL BOARD Insert appropriate number)	No	5	-
(1) OW			
N T			

(11) WELL LOG: 203

\$7025 6-57 50M QUIN A SPO

Name		Total depth	203 _{ft.}	Depth of completed well	203 _{ft.}
Address	<u></u> .	Formation: Describe	by color, character	, size of material, and structure	•
		<u> </u>	<u>2 ft.</u>	2' Top soil	
		2	9	7' Yellow cla	
(2) LOCATION OF WELL:		9	15		gravel & shale
County Colusa Co. Owner's number, if a	n y	15		50' Yellow cla	
R. F. D. or Street No.		75	102 2	27' Yellow cla	y, gravel
Sec. 11, TWP 16 N, R 4 W		100		and shale	
300' west of Mills Orchard 1	Rd.	$\frac{102}{112}$		10' Brown shal	
		$\left \frac{112}{117} \right $	117		ravel, shale
				14' Yellow cla	
(3) TYPE OF WORK (check):	ч.	<u>++</u>			ravel, shale
		146	203	57' Sand rock	& pea gravel
	ioning 🗌 Abandon 🗌				
If abandonment, describe material and procedure in Ite					
(4) PROPOSED USE (check):	(5) EQUIPMENT:				
Domestic 🔲 Industrial 🗌 Municipal 🗌	Rotary K			CONFIDEN	-
Irrigation 🔲 Test Well 🗌 Other 🛛 🕱	Cable				TIAL LOG
(stock)	Dug Well			Water Code	Sec. 13752
(6) CASING INSTALLED:	If gravel packed				
SINGLE DOUBLE Gage	C			·····	
From ft. to ft. Diam. Wall	Diameter from to of Bore ft. ft.				
<u> </u>	18" 0 203 "		**		
	··· •				
	ст ^с е			······	
······································	ı (85				
· · · · · · · · · · · · · · · · · · ·			······································		
Type and size of shoe or well ring	Size of gravel: Pea gravel		**		
Describe joint Welded					
WO Z GO G	······································		·····		
(7) PERFORATIONS:					
Type of perforator used Machine cut at fac	ctory				
Size of perforations 1/8 in., let	ngth, by 3 in.		c +		
From ft. to ft. Perf.	per row Rows per ft.		· · ·		
	νη ετ ετ τη τη				
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ετ ετ τ ² .	τς τε ει σε				
	er 11 (r 1 1 e l			Rand W P	
				<u></u>	DR
(8) CONSTRUCTION:					C. A. P. F.
Was a surface sanitary seal provided? 🔲 Yes 🖾 No To wi	nat depth ft.	Plotted and	Calal		- Contand 1
Were any strata sealed against pollution? 🗌 Yes 🖄 No If	yes, note depth of strata	Plotted and	-Coded		
From ft. to ft		As Well	6N 1.41	J _ 2P80	
1 ² (/	and the second			······································	
Method of Sealing		Work started 12	-4	1963, Completed 12	2-12 19 63
			······································	· · · · · · · · · · · · · · · · · · ·	
(9) WATER LEVELS:		WELL DRILLER			
Depth at which water was first found	ft.	This well was a my knowledge and		y jurisdiction and this repo	ort is true to the best of
Standing level before perforating	ft.	NAME		LUHDORFF	
anding level after perforating	ft.	INAME	(Person, firm, or		Typed or printed)
		Address		AIN STREET	
	k of page		WOODLAN	D. CALIFORNIA	
Was a pump test made? ZYes DNo If yes, by whom? E			EL I	20,11	
	ft, draw down after hrs.	[SIGNED]	216. 3	undorth	
	ysis made? Yes X No	License No. 12	3211	Well Driller	3 19 64
	للتقوي فغذ لينا بسسست	I LICENSE INO. ⊥ /	1711	Lated 1211	, 19 04

Was electric log made of well? 🗌 Yes 🛣 No

DWR 18	8 (REV	3.54)

, 19.64

13

Ł Code

Results of Test as follows:

Static level 20'

ATER WELL DRILLER'S REPORT (Sections 7076, 7077, 7078, Water Code)

LOUATION NOT CHECKE Do Not Fill In **N**⁰ 77484 2P State Well No.

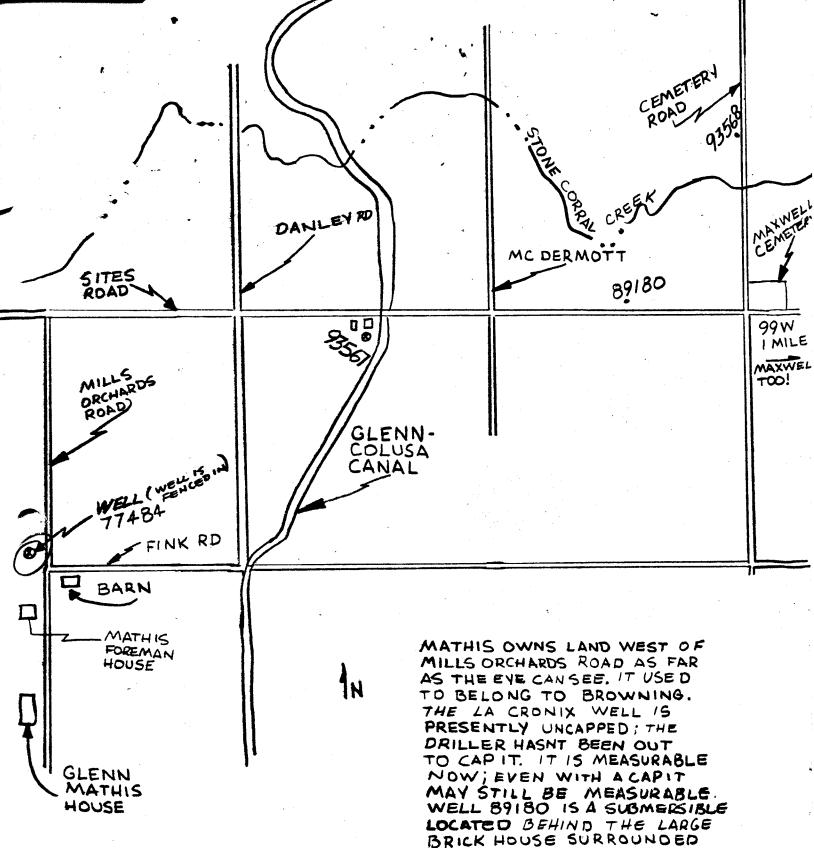
5 GPM @ 96' Pumping level 0 * @ 116'	STATE OF (NA.			State Well No.
7 10 0 1501 10 10		(11) WE	LL LO	G:		
		Total depth	203	ft. I	Depth	of completed well 203
11011292		Formation: Des	icribe by col			material, and structure.
		<u> </u>	t. to		2'	Top soil
		2	···		$\frac{7'}{(1)}$	Yellow clay
(2) LOCATION OF WELL:		9			$\frac{6'}{0!}$	Sand, pea gravel & sha
County Colusa Co. Owner's number, if any		75			0' 7'	Yellow clay
R. F. D. or Street No.	••••••••••••••••••••••••••••••••••••••		1	.02 2	1	Yellow clay, gravel and shale
Sec. 11, TWP 16 N, R 4 W		102		.12 1	0'	Brown shale
300' west of Mills Orchard Rd.		112			5'	Sand, pea gravel, shale
		117	1	.31 1	4'	Yellow clay
		131			5'	Sand, pea gravel, shale
(3) TYPE OF WORK (check):		146		203 5	7'	Sand rock & pea grave
New well 🔽 Deepening 🗌 Reconditioning	Abandon 🗌		**	e :		
If abandonment, describe material and procedure in Item 11.						
) EQUIPMENT:				<u></u>	
	Rotary X Cable			L 1		CONFIDENT
Irrigation lest Well Other X	Dug Well			. e		CONFIDENTIAL LOG
						2 DVUD Sec. 13752
	f gravel packed		**			
SINGLE DOUBLE Gage Diameter			16	**		
$\frac{\text{From }_{\text{ft. to}} \text{ft. Diam. } \text{Wall}}{0 203 8-5/8 .188} \left \begin{array}{c} \text{of Bore} \\ 18^{\text{tt}} \end{array} \right ^{1}$		~	j. et	11		
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11 et te' tt			41	•••	•	
			••			
Type and size of shoe or well ring Size of g	gravel: Pea gravel					
Describe joint Welded			••			
			te			
(7) PERFORATIONS:		·	t 1	4.4		
Type of perforator used Machine cut at factor	<u> </u>			11		
Size of perforations 1/8 in., length, by From ft. to ft. Perf. per row	<u> </u>					
From ft, to ft. Perf. per row						
	Rows per ft.	. <u> </u>		••		
	and a second	·	41	e 4		
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<u>·· 112 ·· 203 ·· ·· ·· ·· ·· ·· ·· ·· ·· ·· ·· ·· ··</u>	cc re 41	·	41	e 4		C C C C C C C C C C C C C C C C C C C
<u>112</u> 203	0 0 10 0 0 0	·	4.t 1.t	τι τι ττ 11		C C N P J D P P
(8) CONSTRUCTION:	·· · · · · · · · · · · · · · · · · · ·		۲۲ ۲۲ ۲۲	** ** **	,	CONFIDENT,
(8) CONSTRUCTION:	h ft.	Plotted a	ц ц ц ц ц ц ц ц ц ц ц ц ц ц ц ц ц ц ц	4 11 11 11 11 11 11 11 11 11 11 11 11 11		C.C.M.F.T.P.F.N.F.T. ERCELTER D.F.T. C.C. M.F.T. C.C. M. F.T. C.C. M. F.T. C.C. M. F.T. C.C. M. F.T. C.C. M. F.T. C.C. M. F.T. D.C. M. F.T. M. F.T. D.C. M. F.T. M. F.T. D.C. M. F.T. M. F.T. D.C. M. F.T. M.
(8) CONSTRUCTION: Was a surface sanitary seal provided? Yes X No To what depth Were any strata sealed against pollution? Yes X No If yes, note	h ft.		" " " añd_Co			C C N P J D P N P J L
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112 203	h ft.	As Well . Work started WELL DRII This well ;	" " " " " " " " " " " " " " " " " " "		19 63 T: juris UHD	diction and this report is true to the best ORFF
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	WATER WELL DRILLERS REPORT	o Not Fill In
	FIELD WORK SHEET	77484 2P
		Ilar / Anna E
Report No. 7748	34	
	,,	<u>203</u> ft.
Owner _		l clay
Pump No. SCB		ea gravel & shale
Meter No. 37673	31	clay clay, gravel
		le nale
	LOCATION	i gravel,shale clay
		i gravel,shale ck & pea gravel
Section ZP	· · · · · · · · · · · · · · · · · · ·	en a pea glavel
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Range 4W		ENTIAL LOG
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	feet North,	
	feet West from S. E. corn of Section	er
	REMARKS	F J D E W
masinal	ple	A J
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		12-12 19 63
		report is true to the best of
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\$7025 6-57 50M QUIN 🛆 SPO

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DWR 188 (REV. 3-54)



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DWR 188 (REV. 3-54)

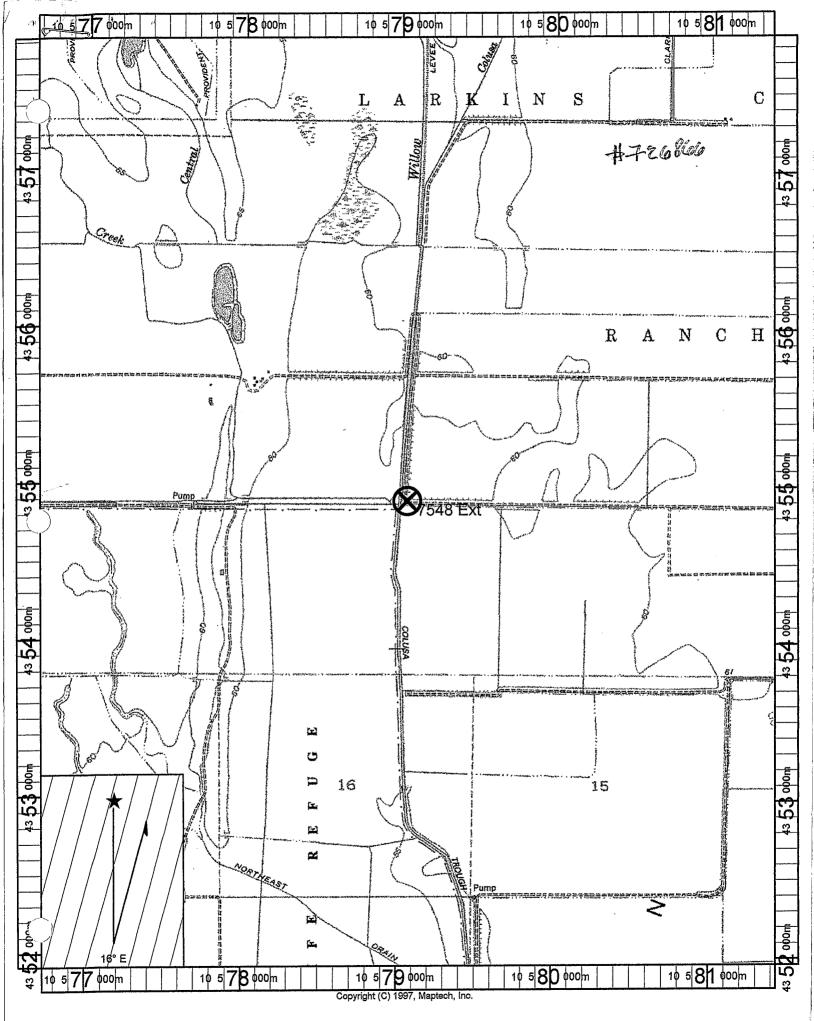
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	496	506	BROW	NS	AN	D		(NNED USES(∠)	
	506	526	OLIVE	GR	AY	CL	AY				1							R SUPPLY	
	526	544	GRAVE	EL				· · · · · · · · · · · · · · · · · · ·			ST ST)				ST		Domestic Public rigation Industria	.1
	544	618	OLIVE	GR	AY	CL	AY				WES					Ę	"		
	618		GRAVE					ID			1							MONITORING	
_	661		OLIVE						·								CATHO	DIC PROTECTION	
)	688		GRAVE					5		<u> </u>								HEAT EXCHANGE	.
\sim	736		DARK															DIRECT PUSH	
	746		GRAVE											x				INJECTION	
	752		GREEN		I BI	A	CK		- 								VAPO	DREXTRACTION	1
	775		SAND								·			- SOUTH				SPARGING	
	785		GRAVE	-1 Δ	ND	ŝ		<u>٦</u>				Illustrate or Describe L	Dist	ance of Well from Roads, I	Building:	ι, if			
	801		BLACK								'n	iecessary. PLEASE B	BE A	tach a map. Use additiona ACCURATE & COMP	LETE.			TENSOMETE	
	822		GREEN								Γ	WATEI	R J	LEVEL & YIELD	OF C	OMPL	ETED	WELL	
	836		SAND		10						Ι,	DEPTH TO FIRST V	۸/Δ	TER (Ft.) BEI	OW S		-		
	846		GREEN	IICL		D٨	vr		_,_,_,			DEPTH OF STATIC		(.)			-		i
	866		;					VITH SAND						(Ft.) & DATE	MEASU	JRED _			_
			·					VIIII SAND			E	ESTIMATED YIELD *	*_	(GPM) & T	EST T	YPE			_
	TOTAL DE						(Fee				1	TEST LENGTH		(Hrs.) TOTAL DRAW	DOWN		_ (Ft.)		
	TOTAL DE	PTH OF	COMPLET	ED	WE	LL	863	(Feet)				May not be repr	ese	entative of a well's la	ong-ter	m yield	1		
1								~]	Γ						٦
	DEPT FROM SUF	H	BORE -		ΈE	1.7		<u> </u>	ASING (S)					DEPTH FROM SURFACE		ANN		MATERIAL PE	-1
			HOLE DIA.		2	. जू	Έ	MATERIAL /	INTERNAL	GAUGE	I	SLOT SIZE		TROWIGONTAGE	CE-	BEN-			-
	Ft. to	Ft.	(Inches)	BLANK	SCREEN	DICTOR		GRADE	DIAMETER	OR WAL		IF ANY (inches)	ł	Ft. to Ft.		TONIT		FILTER PACK (TYPE/SIZE)	
	····			đ	ŝ	<u>'</u>	린		(Inches)	I HICKNE		(incries)		10 10 10	(⊻)	(<u>⁄</u>)	(⊻)		
	510	520	18		\checkmark			PVC	2-1/2			.020	L	0 20	_ ✓_			SAND SLURR	-1
	520	540	18	1				PVC	2-1/2	SCH	80)		0 190		~		BENTONITE/LI	
									ļ				L	190 302			~	#8 GRD SAND	
														302 438		×		BENTONITE/LI	1
									.			. I		438 578			•	#8 GRD SAND	
													L	578 749			<u>) ()</u>	BENTONITE/LI	<u>'</u>
I			IMENTS	(⊻)	-					-4.41.1		- CERTIFICA	TI	ION STATEMENT		100			٦
\frown	·	Geologic Well Cor	Log struction Di	agran	1			I, the undersig	gned, certify the ATON DRII	at this report	15 Ci).	complete and accurate	e to :	the best of my knowledge	andibe	нет.			
	/		ical Log(s)	5				(PER	SON, FIRM, O	R CORPOR/	ATIC	ON) (TYPED OR PRI	INT				~	05005	
			r Chemical	Analy	sis			ADDRESS	NTUCKY	AVE.				WOODLAN CITY	<u>u</u>		CA STATE	<u>95695</u> ZIP	
	ATTACH ADD	Other		N 15		dST	 S	Slaned	Mach			iàn		0	9/29/0	3	(C57 A HIC - 13378	33
1	ATTACH ADL			., "							_	EPRESENTATIVE	1118		TE SIG	NED		C-57 LICENSE NUMBER	5

.



FUL A-L-L-A BARNER A TELEVISION AND A DECK	DRILLERS REPORT , 7077, 7078, Water Code)
CONTROL BOARD No. 5 STATE O	F CALIFORNIA State Well No.
/	(11) WELL LOG:
	190
A - an	Formation: Describe by color, character, size of material, and structure. ft. to 39 ft. Yellow clay
	= <u>39 60 sand</u>
(2) LOCATION OF WELL:	<u> </u>
County Colusa Owner's number, if any Well #1	- <u>177 181 sano</u> - <u>181 gravel</u>
R.F.D. or Street No. R.F.D. 3 miles east & 1 mile north of	
Maxwell, Calif.	
(3) TYPE OF WORK (check):	
New well 🖾 Deepening 🗌 Reconditioning 🛄 Abandon	
If abandonment, describe material and procedure in Item 11.	
(4) PROPOSED USE (check): (5) EQUIPMEN'	
Domestic 🕱 Industrial 🗌 Municipal 🗌 Rotary	
Irrigation Test Well Other Dug Well	[]
(6) CASING INSTALLED: If gravel packed	Section Ton - NTT
SINGLE \square DOUBLE \square Gage From O (r in $]$ 59 (r O Diam $3/7$ for $[$ Diameter from f for f	
From O ft. to 159 ft. 6 Diam. 3/16 all of Bore ft.	
a a a a a a a a a a a a a a a a a a a	
Type and size of shoe or well ring $\frac{2}{3x4x5}$ Size of gravel: Describe joint Welded	
	2 D
(7) PERFORATIONS:	n n
Type of perforator used torch	
Size of performions $\frac{4}{2}$ in., length, by $\frac{1}{2}$. From $\frac{1}{2}$ 7t. to $\frac{1}{2}$ 9 ft. Perf. per row Rows per	
	-Plotted and Coded
ан р. с. нар. ан	Fioned and Codea
	A: Well' 17 1 7 1 - 30 K87)
	As Well 17. N 7 2 - 30 K80
(8) CONSTRUCTION:	
(8) CONSTRUCTION: Was a surface sanitary seal provided? [] Yes [KNo To what depth]	As Well
(8) CONSTRUCTION: Was a surface sanitary seal provided? [] Yes [KNo To what depth Were any strata scaled against pollution? [] Yes [K] No If yes, note depth of strata From (t. to ft.	As Well
(8) CONSTRUCTION: Was a surface sanitary seal provided? Were any strata sealed against pollution? From (t. to ft. To the ft.	As Well
(8) CONSTRUCTION: Was a surface senitary seal provided? Were any strata sealed against pollution? Yes X No If yes, note depth of strata From (t. to ft.	As Well 17.N 7.W - 30 K80 ft. Plotted and Coded (1973) As Well 17.N 7.W - 36A80
(8) CONSTRUCTION: Was a surface sanitary seal provided? Were any strata sealed against pollution? Yes No If yes, note depth of strata From (t. to ft. Method of Sealing	As Well
(8) CONSTRUCTION: Was a surface senitary seal provided? Yes INO To what depth Were any strata sealed against pollution? Yes INO If yee, note depth of strata From (t. to ft. Method of Sealing (9) WATER LEVELS:	As Well
(8) CONSTRUCTION: Was a surface senitary seal provided? Yes Yes No If yes, note depth of strats From (t. to ft. Method of Sealing (9) WATER LEVELS:	As Well I.T.N. I.T.N. I.T.N. ft. Plotted and Coded (1972) As Well I.T.N. I.I.T.N. I.I.T.N. Work started 4/5/ 19 60 Completed 4/8/ 19 60 Work started 4/5/ 19 60 Completed 4/8/ 19 60 WELL DRILLER'S STATEMENT: This well was drilled under my jurisdiction and this report is true to the bes. ft. my knowledge and belief. 19 60
(8) CONSTRUCTION: Was a surface sanitary seal provided? Yes Row To what depth Were any strata sealed against pollution? Yes To make the pollution? Yes Row To what depth Were any strata sealed against pollution? Yes To make the pollution? Yes Method of Sealing (9) WATER LEVELS: Depth at which water was first found 20	As Well
(8) CONSTRUCTION: Was a surface senitary seal provided? Yes No To what depth Were any strate sealed against pollution? Yes No If yes, note depth of strates From (t. to ft. Method of Sealing (9) WATER LEVELS: Depth at which water was first found 20 ding level after perforating ling level after perforating	As Well I.T.N. I.T.N. I.T.N. ft. Plotted and Coded (1972) As Well I.T.N. I.T.N. I.T.N. Mork started 4/5/ 19 60 Completed 4/8/ 19 60 Work started 4/5/ 19 60 Completed 4/8/ 19 60 Well DRILLER'S STATEMENT: This well was drilled under my jurisdiction and this report is true to the bes. ft. NAME L.C. 1 @rkison Drilling Co. ft. (Person, firm, or corperation) (Typed or primied) Address XXX Box 324
(8) CONSTRUCTION: Was a surface senitary seal provided? Yes RNo To what depth Were any strata sealed against pollution? Yes To No If yes, note depth of strata From (t. to ft. Method of Sealing (9) WATER LEVELS: Depth at which water was first found 20 ding level after perforating ling level after perforating (10) WELL TESTS:	As Well
(8) CONSTRUCTION: Was a surface senitary seal provided? Yes No If yes, note depth Were any strata sealed against pollution? Yes No If yes, note depth of strata From (t. to ft. Method of Sealing (9) WATER LEVELS: Depth at which water was first found 20 ding level after perforating ling level after perforating (10) WELL TESTS: Was a pump test made? Yes No If yes, by whom?	As Well I.T.N. I.T.N. I.T.N. ft. Plotted and Coded (1972) As Well I.T.N. I.T.N. I.T.N. Mork started 4/5/ 19 60 Completed 4/8/ 19 60 Work started 4/5/ 19 60 Completed 4/8/ 19 60 Well DRILLER'S STATEMENT: This well was drilled under my jurisdiction and this report is true to the bes. ft. NAME L.C. 1 @rkison Drilling Co. ft. (Person, firm, or corperation) (Typed or primied) Address XXX Box 324

STATE OF CALIFORNIA THE RESOURCES AGENS DEPARTMENT OF WATER RESOURCES

State No. 17N-2W-30J2

ninis veritammeni i simu an Ksuasi domi sukati numusi si muga

WELL	DATA
------	------

• 4 \$		DATA	BRANCH
wher		State No.	
Address		Other No	
Tenant			
Address			
Type of Well: Hydrograph ()	Key [_] Index [_]	Semiannual [~]	G.W.M.P
Location: County Colu	5a	_BasinZolus	No. 5-21.04
U.S.G.S. Quad '/ Section _	Maxwell	71/2	Quad. No 178 d
Section	, Twp	, Rge,SB	Base & Meridian
Description 4 Mi. Elo max	well on Maxue	11 Colusa Ra."	on Rouch Rd. approx.
Non Amile RA 1/4	mi. To Ranch 1	2d west. N/W	on Rounch Rd. approx.
14 mi. To Ranch Head	iquarters. well 15	o in P.H. EJO BO	<u></u>
Reference Point description	-ple Tup on East	- Side of P.H.	
which is ft. below to	and surface. Ground Elevat	ion	
Reference Point Elev.			
Well: Use <u>Domi</u> Casing, size <u>G</u> in., pei	Condition		Depth _ 1 8 2
Casing, size	-2 To 159		······································
			and the second
Measurements By: DWR [] USGS			
			th to Bot. Aq
			ckness
Gravel Packed? Yes [j No	Depth to Top Gr	Oep	th to Bot. Gr.
Copp. Aquiter	Depth to Top Aq.	Dep Dep	ith to Bot, Aq
ariller <u>A-92260</u>	Diffing Cor	150112 6119	th to Bot, Aq
Equipment: Pump, type 50b	Log, filed	open (1)	
Power, Kind Elec. Make	lischarge pipe in,) \$on. (2) H.M. (3)
H. P Mater Serial No.	4367200-10		Yes (1) No
Elec. Meter No. 69036 Tr		-	1 End
Yield G.P.M.		r	T (2) N. 11 (2)
11e10 U,r.m.	r'umping level	Prod. Rec. (1) P	ump Test (2) Yield (3)
SKETCH	· · · ·		REMARKS
	· N		
		····	
Barns Pr	N -	·	
	Trailer		
	Hovse		
			
K.		······································	
	Ya mi.	· · · · · · · · · · · · · · · · · · ·	······································
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	// u		······
Maxwell	Le La		
C Manual calases	R1,	Received by a	
There are a Maxwell - Colusa F	N97	Recorded by:	
	, , , , , , , , , , , , , , , , , , ,		

асфафийстрика формура

aferfiliestalmelses sussa aferfeitespractic mete

ana seria ana ang manana ang manan Manana ang ma 网络胡拉马斯斯 医帕拉尔二甲基氨基苯

ORIGINAI File

GIRA	•
with	DWR

WATER WELL DRILLERS REPORT

Do Not Fill In

(Sections 7079, 7080, 7081, 7082, Water Code)

No 49451

THE RESOURCES AGENCY OF CALIFORNIA DEPARTMENT OF WATER RESOURCES & Computer No. 171/340-81

										Soc Venet Out two		
							(11) WELL	LOG:		Jacobie 13- Stall	EZ.	
							Total depth		ft. I	151	ft.	
							Formation: Describ					
						i ⁿ			ft. t			ft.
(2) LOC	ATIO	NOFW	VELL :				01	to	6'	<u>Top Soil</u>		
County	Colu			wner's numb	er, if any		61	to	14'	Yellow Clay		
Township, Ran	ge, and Sec	tion -	F17N R3				141	to		Sand Yellow	Clay	<u> </u>
Distance from	cities, road	s, railroads, e	. 200)' Nort	h of Ler	nahan Rd	30'	to	<u>_50'</u>	Yellow Clay		
			•	<u>.</u>			50'	to	601	Red Clay		
(3) TYP	E OF	WORK	(check)	:			60'	to		Sand Yellow	Clay	
New Well	De De	epening 🗌	Recond	litioning [] Destroyi	ng 🗌	821	<u>to</u>	<u>87 •</u>	Red Clay		
lf destructio	n, describ	e material a	ind procedu	re in Item		<u> </u>	87'	t.o	94	Sand Red Cl	ay	
(4) PRO			• •		(5) EQU	IPMENT:	94'	to	1401	<u>Red Clay</u>		
Domestic	_	_	_		Rotary		140'	t.o_	147!	Sand Red Cl	•	
Irrigation	Te:	st Well 🗌] Ot	her 🗌	Cable		147'	to.	<u>151!</u>	<u>Sand & Grav</u>	el	
					Other							
(6) CAS	ING I	NSTAL	LED:								 .	
STE	[L:	отн	ER:]	(f gravel pa	cked					······	
SINGLE 🕅	DOU	BLE []										
ł		1	1	Diamata		1				· · · ·		
From	То		Gage or	Diamete of	From	To						
ft.	ft.	Diam.	Wall	Bore	ft.	ft.						
)	130	611	.188									
~												
											• •	
Size of shoe or	well ring:	homem	ade	Size of gra	vel:							
Describe joint		weld	ed									
(7) PER	FORA			EEN:				·· ·			~	
Type of perfor			torc					_	CO	NEIDENTIAL LO		
	1	1							Wa	ter Code Sec. 13	/ J2h	
From		То	Perf. per	Rows per		Size				2		
ft.		ft.	row	ft.	i i	n. x in.				· · · · · · · · · · · · · · · · · · ·		
125	·	30	••• •	4	- 4	·x¼	_, .			C. L. L. N. J		
<u></u>			t	<u> </u>			Ploffed at	id Cod	ed www.b	Hera Carosad	(
				┨─────			As Well	1781	1341	R81		
				<u> </u>			As_vveii	<u> </u>	/ <u></u>			
	-		_ .									
(1) CO		ICTION		1	I		+ Flotted an	d Cede)d			
(8) COI				. 16 1	71 1 . I . I	4.	As Well	17N	1311	- 8080		
Was a surface					To what depth	ft.	As Well	Lafaslavas	/ <u></u>			
Were any stra		<u> </u>		No 🗌	If yes, not	te depth of strata						
From	ft	. to	ft.					21.		1 1 7 20		
From		. to	ft.				Work started 3-		19 7 <u>2 . C</u>	mpleted 3-29 1	, 72	
Method of sea	-		<u>c casin</u>	lg			WELL DRILL			risdiction and this rep	ort is true to	the he
(9) WA	TER I	LEVELS	:				of my knowledg					
Depth at whi	ch water v	vas first foun	d, if known	20) <u>ft</u> .		-					
Standing_leve	l before p	erforating, if	known		ft.		NAME Squ	<u>ier Dr</u>	<u>illing</u>	& Pump Serv: corporation) (Typed or)	LCC	
Standing leve	l after per	forating and	developing	20) ft.				-	Tree or		
(10) WI	ELL T	ESTS:							<u>98 56 x</u>			
as pump tes	t made?	Kes 🗌 No	, Х I	f yes, by who	- m			<u>te Cit</u>	y, Cal	<u>ifornia 9592</u>	0	
ield :	,	al./min. with	1	ft. draw	lown after	hrs.	[SIGNED]	estin	tour			
Temperature	of water		Was a chemi	cal analysis m	ade?Yes 🗌	No 🗌	4 .		V	(Well Driller)	•7	
Was electric l	og made of	well? Yes [N₀ ไ	If ye	, attach copy		License No2	15570		Dated April	<u>> </u>	19

SKETCH LOCATION OF WELL ON REVERSE SIDE

WATER WELL DRILLERS REPORT

•

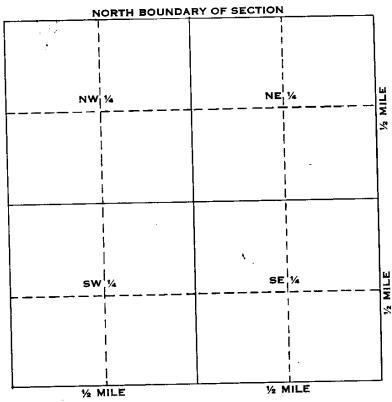
W200

BARRENIUS

FIELD WORK SHEET

	Report No. 49451 (\rightarrow) Owner Pump No. 543 Meter No	
-	LOCATION Section <u>BR</u>	
	Township	
	feet North, feet West from S. E. corner of Section REMARKS	
-	meanuchte and 200' moreh of lenchand Field Checked by 8-12-14	•

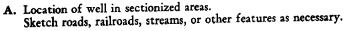
•							17N/3W-32-H
-2							Do Mod Ell Lu
					тн		CALIFORNIA Do Not Fill In RCES AGENCY DO DO CO
ORIGIN. File with				DEF	PARTM	ENT OF V	WATER RESOURCES Nº 93568
				WA	TER V	WELL D	ORILLERS REPORT State Well No. Code Sec. 192
							Suc 12
							(11) WELL LOG:
							Total depth 140 ft. Depth of completed well 112 ft.
						.	Formation: Describe by color, character, size of material, and structure
(2) LOC			ELL:				0 - 19- Jellow Cloy
County C	alus	a_		Owner's number.	if any		10 - 32 - Stand + Alsonet
Fownship, Rai Distance from			17	: 11) 9	2 2/.1	4701' To	32 - TO - zettore Cloy
of the	maines, rosas,	l' cr	1 Par	no Tar		and <u>M. M.</u>	70 - 71 - Stand & Stonel 71 - 105. vellor clore
Ø) TYP	F OF V					-9	105 - 108. Sauch Clou Alsonal
New Well []				ditioning	Destroyi	ng 🗌	109 - 112 Zellow Cloy
$(4) \mathbf{PRO}$				tre in Item 11.	(5) FOI	IPMENT:	11h - 170. Blue Elog -
Domestic	Indu Indu	strial 🗌] Munici	ipal 🖂 📋	Rotary		
Irrigation	🗍 T e st	Well [] 01	ther 🔲 📔	Cable		
(6) CAS	ING IN	STATI	FD.		Other		
STEI		OTHE		If	gravel pac	ked .	
SINGLE D				i			
- I			Gage	Diameter	1_	1 _	·
From ft.	To ft.	Diam.	or Wall	of Bore	From ft.	To ft.	
0	112	6 5/8	10 80	12	0	140	
)		/				/	
Size of shoe or	well ring:			5ize of gravel:	3/1	I	
Describe joins	Bui	# 20	eld.				
•	FORATI		$\frac{3}{16}$	EEN:	0	e.	CONFIDENTIAL LOG
Type of perform	riton or name	or screen	Perf.			<i>[2 0]</i>	Water Code Sec. 13752
From	То		per	Rows per		Ø Size	
ft.	ft.		row	ft.	in 1/	. x in.	
101	113			P	- 3/16	XI/L	
8) CON	ISTRUC	TION:			_ _		Plotted and Coded
Vas a surface s				<u>_ To</u>	what depth	HO fr.	A. Well 17N / 3W 32.480
Vere any strat.		· ./	Yes D	N₀ []	If yes, not	depth of strata	
rom () ft. to ft. to	40	<u>ft.</u>				Work started 3 29 1971 . Completed 3 29 19 74
lethod of seali		men	<u>}_</u>	· · ·			Work started 3/29 1974, Completed 3/29 1974 WELL DRILLER'S STATEMENT:
9) WA]	TER LE						This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
Depth at which				<u>.</u>	ft.		A A DODING
itanding level				A. P	<u>ft.</u> ft,		(Person, firm, or corportion) (Typed or printed)
(10) WE		A.	1 gitte	1 appin	2000	P.M.	Address Do Day 470 W illows
way pump test	· · · · ·	·		yes, by whom?		· · ·	Do to of
<u>ield:</u> Femperature of		nin. with	Vara chamit	ft. drawdown al analysis made?		hrs.	[SIGNED] Stelph J chuith)
Was electric los				If yes, att			License No. 195165 Dated 8 6 1974
						······································	

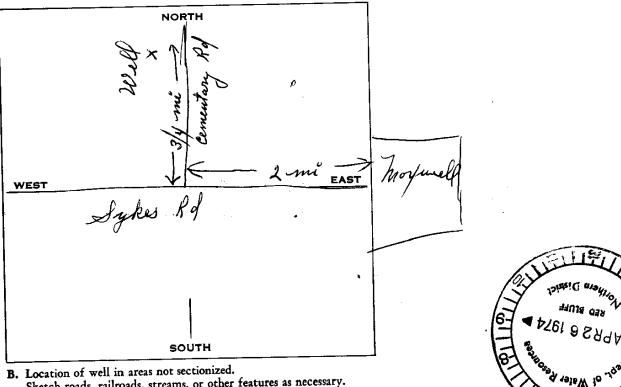






Section No .__





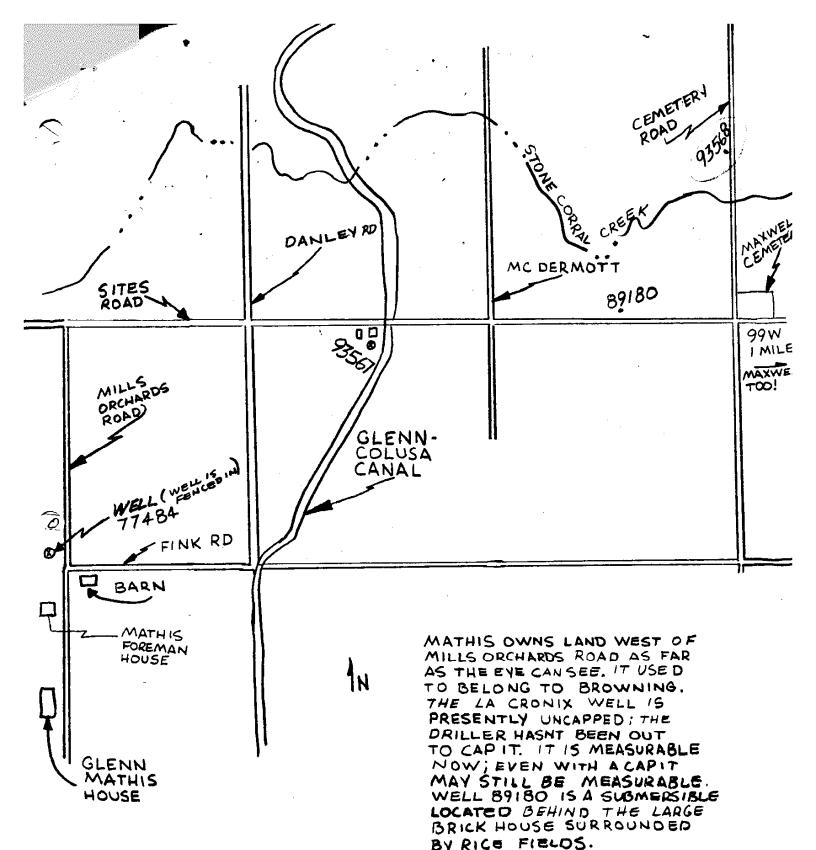
B. Location of well in areas not sectionized. Sketch roads, railroads, streams, or other features as necessary. Indicate distances.



	WATER W	ELL DRILLERS REPORT	all.
	FI	ELD WORK SHEET	
Report No. 935	T6 <u>8</u>	LOCATION MARKAN	
Owner		- Kas	E
Pump No. <u>SB</u>			-
Meter No.		Entry	
	N .	pr y	і
		LOCATION	NOV
Section 324	1	MAINT	
Termship /7	<u> </u>	18-10	
Township7 Range34	Ĵ	·	
	······································		ר (
ATWELL SIKES	RD	_ / 0	
5120	1		
MAXUE	EN		
LEMET	11	-	
N		RED BARN	
STONE		feet North,	
CORRAL CREEK		feet West from	S. E. corner of Section
✓ 4 40 10	/	D.D.V.4.D.V.0	
	10-1	REMARKS	
Measuro	the th	wer sonth	e west
side of	en shed	Unluch 2001 of Ald	Jorn

Field Checked by B-12-74

1000 1919



ÆL.

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File with						WE	LL			DN	REPOR	т	18/		200		1 7 1 8 TION NO.	
Page 1 of Owner's		7986							». E04	-	•		111	1				
		9/5/200	5			, Ended	9/14/2	006		<u> </u>	T 1 Am		LATITUDE		L} L	LC	DNGITUDE	
		Agency C		NN C														
Perm	nit No.	<u>/W 247-0</u>)6				Permit	Date 6/1	5/2006					Al	PN/TRS/	OTHER		
			GEO)LO	GI	CLOG				1		-						
ORIENTA	\T!ON (⊥)			Υταβ	H 2V			ANGLE										
	H FROM			<u>, 17 m</u>		DESCRII			·									
Ft. t	o Ft.						ain, size	e, color, etc	<i>c</i> .	ļ		v		זיגיא	ON			
0		DARK									ddress .93 MI	NOF RD (8 8 525	S'EOF	NOF	<u> RMAN</u>	RD	
20		SILTY				·				C	ity <u>CA</u>							
100	<u></u>	· · · · · · · · · · · · · · · · · · ·							IE SAND		ounty GLENN							
170								RSE SAN	<u> </u>	A	PN Book 013							
210	1								<u> </u>		ownship <u>18 N</u>	Range	<u>2 W</u>	Sectio	n <u>18</u>			
280		BROW						, WITH CO	ADGE	L	atitude	AIN. SEC			-	DEG.	MIN. SEC.	
400	521	SAND					ULAT 1		ANGE	–		CATION S					CTIVITY (∠) •	
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800	•							ITTLE GF		WEST	· • •				EAS	"	rrigation Indust	
000	1 000									•			•	· · ·.	· , _		MONITORING -	
850	102							WITH SA						· .		h.TUO	TEST WELL	
000	1 102	AND G							110 111 - 121	-	· · · ·	t		· . ·			DIC PROTECTION	
1025	1040				<u> </u>			<u></u>	<u></u>	- Lander (M. A. 1997), 2007 - 2007 - Antonio Alexandro Martine (M. 1997), 2007 - Antonio Alexandro Martine (M. 1997), 2007 - 2007 - Antonio Alexandro Martine (M. 1997), 2007 - 2007						DIRECT PUSH INJECTION VAPOR EXTRACTION SPARGING		
1020								WITH SA	ND									
						REAKS			· · · · · · · · · · · · · · · · · · ·									
	! !	1					. 11, .			SOUTH								
	¦ I	4.																
	 	1					2		· · · · ·	necessary. PLEASE BE ACCURATE & COMPLETE.								
	i . I	1								1	WATE	R LEVEL &	: YIELD	OF CO	OMPLI	ETED	WELL	
	r' I	1								D	EPTH TO FIRST 1	WATER	(Ft.) BE	LOW S	URFACI	Е	•	
	 	1								- DI	EPTH OF STATIC	STATIC VEL (Ft.) & DATE MEASURED						
	r <u> </u>	1 -																
TOTAT	EPTH O	BORING	120	0		'eet)			· · ·		STIMATED YIELD		• •					
		COMPLE					(Feet)				EST LENGTH							
					~		. (2 000)			<u> </u>	May not be repre	esentative of	a well's la	ong-ter	in yield			
DEF		BORE	·		•		C	ASING (S)				DFP	тн		ANN	JLAR	MATERIAL	
FROMS	URFACE	BORE - HOLE	TΥ	PE (<u>~)</u>					1		DEP FROM SU	RFACE	1		TY	/PE	
		DIA. (inches)	ANK	SCREEN	d d.	MATE GR/	ERIAL / ADE	INTERNAL DIAMETER		L	SLOT SIZE IF ANY			CE-	BEN- TONITE	E FILL	FILTER PACK	
Ft. to	o Ft.		Ы		불분			(inches)	THICKNE	SS	(Inches)	Ft. to	Ft.	(⊻)	(⊻)	(2)	(TYPE/SIZE)	
ZONE												0	130	1			SAND SLUR	
0	246					PVC		2.5				130 ¦	134		\checkmark		BENTONITE	
246	256			✓	-	PVC F		2.5			.030	134	223			V .	SRI#8 SAND	
256	266		1			PVC F	-480	2.5	SCH	80	·	223	235		~		BENTONITE	
ZONE				·			- 100	· · · · ·		00	· · · · · ·	235	280			~	SRI#8 SAND	
0			1	<i></i>		PVC I	-480	2.5	SCH	80		280	290	1	V .		BENTONITE	
		HMENTS	(⊻)					 افید ۲۰۰ واژین			- CERTIFICA				h - P - 4			
	Geologi Well C	: Log onstruction D	iagram	. / 1 к. г.	•	і і, th	MAE EI	ATON DRI	lling CC).	omplete and accurate		my knowled	ige and	Dellef.	ļ	Antick Color	
	Geophy	sical Log(s)		· · · ·			(PER	SON, FIRM, C	OR CORPOR	ATIO	N) (TYPED OR PR		0001	-		~		
·	- Soil/Wa	ter Chemical	Analy	sis			DRESS		KY AVE	;	· · · · ·	W	OODLAN CITY	1U		CA STATE	95695 ZIP	
		INFORMATIO			STS		ned	Martis	anno	4			1	0/05/0		í (C57 A HIC - 133	
	_ 00/W/L		, B .			. 11 -	WEI	LL DRILLER/A	AUTHORIZED) RE	PRESENTATIVE		DA	ATE SIG	NED	(C-57 LICENSE NUME	

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ORIGÎNA	AL.							STATE	OF CALIFO	OR	INIA	DWR L		<u> -</u>	- ро	NOT FILL IN
File with	DWR						WELL	COMP								
Page 2 of 1	12							Refer to In			-		STATE V		D./ STAT	TION NO.
Owner's	Well No.	7986						No	^{».} E04	5	5412				1	
Date Wor			3			,	Ended 9/14/2	2006				LATITUE	E		L	DNGITUDE
Local I	Permit A	gency G	ШE	NN	LC(วม	NTY HEALTH	I DEPT				-				
Perm	it No. <u>M</u>	W 247-0)6				LOG Permit	Date 6/1	5/2006			_	A	PN/TRS	OTHER	
			GE	01	00	GIC	: LOG			1						
ORIENTA	TION (⊻)		RTIC	AL.		– нс	DRIZONTAL	ANGLE	(SPECIFY)							
DEPTH	FROM	METHOD	3 <u>R(</u>	DT.	AR'	Y	F	LUID MUD								
SURF						D	ESCRIPTION									
Ft. Describe material, grain, size, color, etc. 0 20 DARK BROWN CLAY									┢		WELL L	OCAT	ION 			
												NOF RD 68 & 52	5' EOI	- <u>NO</u> ł	<u>KMAN</u>	
.20							ROWN CLAY				City CA					
100							INIMUM SAN		E SAND	1	County GLENN					
170							WITH COA		<u> </u>			Page 280				
210									<u> </u>		•	Range2 W	Section	on <u>18</u>		
280 400							WITH SAN		ADSE		Latitude	MIN. SEC.		-	DEG.	MIN. SEC,
400		SAND			VVV	DR	OWN CLAT	WITH CO.	ANGE	┢		CATION SKETCH				CTIVITY (Z) -
520				20						╞		NORTH				NEW WELL
520		BROW				V C			LOW	-						FICATION/REPAIR
700						Ή.	SAND AND C			\mathbf{I}						Deepen Other (Specify)
710		·					OWN CLAY		חוי	-						
		AND G						WIIII 0/ 0		-					<u> - </u>	DESTROY (Describe Procedures and Materials
720							CLAY WITH			-					'	Under "GEOLOGIC LOG"
		GRAVE						0/110/1		-						NNED USES (\checkmark)
760				10	Ŵ	ci	AY WITH SA	ND		Ŀ	.			ST		Domestic Public
800							AY WITH BR		2AY	-12	ME A			Ĕ	 —	rrigation industrial
		CLAY /								-						
850	1025						OWN CLAY	WITH SA	ND						ATHO	TEST WELL
		AND G								-					1	HEAT EXCHANGE
1025		COARS														DIRECT PUSH
1040						BR	ROWN CLAY	WITH SA	ND	-						INJECTION
1		AND G								-					VAP	OR EXTRACTION SPARGING
		l l								┞		SOUTH			1	REMEDIATION
		! 									Fences, Rivers, etc. and	Distunce of Well from Rouds, attach a map. Use additio	nal paper	r, if		OTHER (SPECIFY)
1		1						-		╘	necessary. PLEASE B	E ACCURATE & CON	PLÉŤE.			
1											WATE	R LEVEL & YIELD	OF C	OMPL	ETED	WELL
1		1				•					DEPTH TO FIRST	WATER (Ft.) B	ELOW S	URFAC	E	
1											DEPTH OF STATIC					
1		1														
TOTAL DI	EPTH OF	BORING	120)0		.Œe	et)					* (GPM) &				
TOTAL D					ELL							(Hrs.) TOTAL DRA esentative of a well's			• •	
<u> </u>										-	Muy not be repr			m ytere	* .	
DEP		BORE -					C	ASING (S)				DEPTH		ANN	ULAR	MATERIAL
FROM SU	RFACE	HOLE DIA.		/PE	<u>(</u>	닖		INTERNAL	0.000		SLOT SIZE	FROM SURFACE		1	<u></u>	'PE
F1 1	_	(inches)	BLANK	SCREEN	żĝ	비	MATERIAL / GRADE	DIAMETER	GAUGE OR WAL	L	IF ANY		CE- MENT	BEN-	E FILL	FILTER PACK
Ft. to	Ft.		В	ŝ	CON- DUCTOR	Ξ		(Inches)	THICKNE	SS	S (Inches)	Ft. to Ft.	(⊻)	(1)	(\checkmark)	(TYPE/SIZE)
510	520	14		~			PVC F480	2.5	SCH			290 488	3	<u> </u>	\checkmark	SRI#8 SAND
520	530	14	~				PVC F480	2.5	SCH	8	0	488 500		~		BENTONITE S
ZONE									~		500 543			~	SRI#8 SAND	
620								SCH			543 553 553 598		ļ		BENTONITE S	
630	670	<u>14</u>		-		_	PVC F480	2.5	SCH			•	1	×		SRI#8 SAND
							SCH 80 598 608 BENTONITE S									
Geologic Log						report is complete and accurate to the best of my knowledge and belief.										
Well Construction Diagram NAME_EATON DRILLING CO.							_				<u>.</u>					
Geophysical Log(s) (PERSON, FIRM, OR CORPORAT Soil/Water Chemical Analysis 20 WEST KENTUCKY AVE						ΆT	ION) (TYPED OR PR	INTED) WOODLA	ND		СА	95695				
ADDRESS						•		CITY			STATE	ZIP				
ATTACH AD	DITIONAL II	IFORMATIC	N, IF	п	EXIS	TS.	Signed WE	LL DRILLER/A	UTHORIZED		REPRESENTATIVE		10/05/0 ATE SIG			<u>C57 A HIC - 1337</u> 8 C-57 LICENSE NUMBER
DWR 188 REV	. 11-97			IF	F AD	DIT					· · · · · · · · · · · · · · · · · · ·	NUMBERED FORM				

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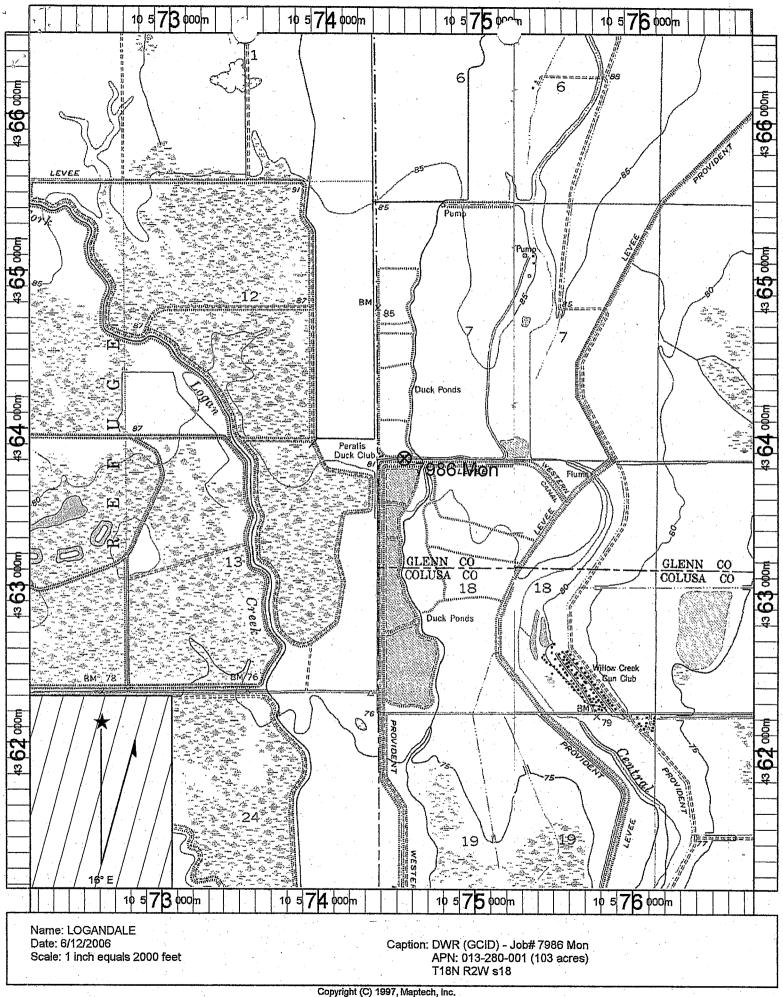
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										OF CALIFORI				<u>LY -</u>	- DO NOT FILL	<u>. IN</u>
	with E						M	VELL		LETION struction Pai	N REPOR		TATE V	NELL N	O./ STATION NO.	
	e 3 of 12	∠ Vell No.	7986						-	E045	-		 	۱ПI		
			9/5/2006	3			End	1ed 9/14/2	006		· ···	LATITUD	ـــــا چ	4	LONGITUDE	
								HEALTH					1 1	11		
Ľ	Permit	No. M	W 247-0	6				Permit	Date _6/1	5/2006			A	PN/TRS	/OTHER	
				GE	olo	GIC	C LO	G ——	<u>Dato</u>			-				
						— нс ?Y			angle	(SPECIFY)						
	SURFA	CE		n				RIPTION								
I	Ft. to		DARK					grain, size	e, color, etc	·	02 MI	NOF RD 68 & 52	QCAT)			
	20		-				-	/N CLAY			Address <u>.95 Mi</u>					
	100								WITH FIN		County GLENN					
	170							UM SAN		\	•	Page 280	Deres	1 001	<u></u>	
	210								RSE SANI		Cownship 18 N	Range2_W				
	280							TH SANE		1	Latitude	Kangez <u>_ 11</u>	Secut	<u>, 10</u>	I '1	
	400	520	SOFT Y	YEL	LOW	/ BR	ow	N CLAY	WITH CO	ARSE	DEG. N					SEC.
	1		SAND							Ľ	LO	CATION SKETCH			ACTIVITY	(⊻)
	520	700	SAND /	ANE) GR	AVE	EL W	ITH BRIT	TLE YEL	LOW						
[BROW												MODIFICATION/REI	
	700	710	BLUE C	CLA	Y W	TH	SAN	ID AND G	RAVEL						Other (S	
	710	720	SOFT \	YEL	LOW	/ BR	OW	N CLAY	WITH SAN	1D					DEDTOOM (C	
		···	AND GI	RA\	VEL										DESTROY (De Procedures an Under "GEOLO	ascribe
	720	760	SOFT	3LU	IE GI	RAY	CLA	AY WITH	SAND AN	ID					PLANNED US	
			GRAVE	EL											WATER SUPPLY	-
	760 ¦							WITH SA						EAST	Domestic Irrigation	. Public Indus
	800	850	SOFT	YEL	LOW	/ CL	AY ۱	WITH BR	ITTLE GR	AY S				B	MONITOF	
			CLAY A	٩NC) SAI	٧D									TEST W	
	850 ¦	1025	BRITTL	.Е С	GRA	/ BR	ROM	N CLAY	WITH SAI	VD DV					CATHODIC PROTEC	TION_
			AND G	RA\	VEL										HEAT EXCHA	
1	1025		COARS									,			DIRECT F	_
1	1040 <u> </u>								WITH SAI	ND			•		VAPOR EXTRACT	
	1		AND G	RA۱	VEL :	STR	EAK	(S							SPARG	
	1		l I								Illustrate or Describe D	SOUTH	Ruildines		REMEDIAT	TION_
			 								Fences, Rivers, etc. and	attach a map. Use addition E ACCURATE & COM	al paper		OTHER (SPEC	CIFY)_
			i							ŀ					L	
	i		l 									R LEVEL & YIELD				
	i		I I		,							VATER	ELOW S	SURFAC	E	
	i		1								DEPTH OF STATIC	(Ft.) & DATI	E MEASI	URED		
	i		l							1		(GPM) &				
			BORING			- (Fe						(Hrs.) TOTAL DRAV				
тот	TAL DE	PTH OF (COMPLE	TED	WEL	L <u>10</u>	00	(Feet)		I	May not be repre	esentative of a well's l	ong-ter	m yield	d.	
	DEPT	<u>ц</u> [·····	С	ASING (S)			DEDT: /		ANN	ULAR MATERIAI	
FR	ROM SUF		BORE - HOLE	TY	(PE (.	<u><)</u>					I	DEPTH FROM SURFACE			TYPE	
			DIA.	¥	SCREEN	FILL PIPE		ATERIAL /	INTERNAL DIAMETER	GAUGE	SLOT SIZE	· · · · · · · · ·	CE-	BEN-	EU TED	PACK
F	Ft. to	Ft.	(inches)	BLANK	R S			GRADE	(Inches)	OR WALL THICKNESS	IF ANY (Inches)	Ft. to Ft.	MENT		TYPE/S	
	670	680	14	-	<u>∞</u> √	<u>-</u>	D\/	C F480	2.5	SCH 80	.030	608 693	(<u>√</u>)	(<u>(</u>)	(⊻) ▼ SRI#8 S	
	680	700	14	~		$\uparrow \uparrow$		<u>C F480</u> C F480	2.5	SCH 80		693 ¦ 716	1	~~	BENTO	
	ONE	4		\vdash								716 930			✓ SRI#8 S	
		975	4/8-3/4	~		$\uparrow \uparrow \uparrow$	PV	C F480	2.5	SCH 80		930 944			BENTON	
	975	985	8-3/4			$\uparrow \uparrow$	PV	C F480	2.5	SCH 80	.030	944 996	1	-	SRI#8 S	AND
	-985¦-	1000	8-3/4	1			PV	C F480	2.5	SCH 80		996 <mark> 1002</mark>	1	└	BENTON	NITE
 		ATTACH	IMENTS ((<u>~</u>)			7				- CERTIFICA	TION STATEMEN	r —	·	<u> </u>	
		Geologic	Log struction Dia					I, the undersi	gned, certify th ATON DRIL	at this report is	complete and accurate	e to the best of my knowle	dge and	beiief.		
		Geophysic		ayran	11			(PER	SON, FIRM, O	R CORPORATI	ON) (TYPED OR PRI	NTED)				
			r Chemical	Anal	ysis		11	20 WEST	KENTUC			WOODLAN	ND		CA _9569	
		Other	VFORMATIO			070	-	ADDRESS Signed	March &	Daman		CITY ,	10/05/0)6	STATE ZIP C57 A HIC	

ORIGINAL File with DWR	W	ELL COMP		N REPOR	\mathbf{T}				
Page 4 of 12		Refer to In		-		STATE V		D./ STAT	ION NO.
Owner's Well No	7986	N	• E04	5412					
Date Work Began						<u>. </u>			
	gency GLENN COUNTY		E 10000		— L <u>. l. l. l</u> .	AF	N/TRS/	OTHER	
Permit No. M	GEOLOGIC LOG	Permit Date 6/1	5/2006						
	VERTICAL HORIZON								
DEPTH FROM		FLUID MUD							
SURFACE Ft. to Ft.		grain, size, color, etc	2.	1					
	DARK BROWN CLAY			Address .93 MI	NOF RD 68 & 52	BEATI	NOF	RMAN	RD
	SILTY ORANGE BROW			City CA					
	SILTY YELLOW BROW		E SAND	County GLENN					
	TAN CLAY WITH MINIM				Page 280	Parcel	1 0 0 1		
1l	BROWN TAN CLAY WIT		D	Township 18 N	Range2 W	Sectio	n <u>18</u>		
	BROWN TAN CLAY WIT			Latitude			_	1	
	SOFT YELLOW BROWN	N CLAY WITH CO	ARSE	DEG.	MIN. SEC. CATION SKETCH			DEG.	MIN. SEC. CTIVITY (2)
	SAND				- NORTH				NEW WELL
520 700	SAND AND GRAVEL W	TH BRITTLE YEL	LOW					MODI	ICATION/REPAIR
	BROWN CLAY								— Deepen — Other (Specify)
· · · · · · · · · · · · · · · · · · ·	BLUE CLAY WITH SAN								
710 720	SOFT YELLOW BROWN	N GLAT WITH SAL						g	DESTROY (Describe Procedures and Materials
720 760	SOFT BLUE GRAY CLA							i i	Inder "GEOLOGIC LOG"
1201 100	GRAVEL								NNED USES (\checkmark)
760 800	SOFT YELLOW CLAY V			ST			н	C	R SUPPLY Domestic Public
	SOFT YELLOW CLAY		AY	WESI			EAST	I	rigation Industrial
	CLAY AND SAND								
850 1025	BRITTLE GRAY BROW	N CLAY WITH SA	ND						TEST WELL
1	AND GRAVEL								HEAT EXCHANGE
1025 1040	COARSE SAND								DIRECT PUSH
	BRITTLE GRAY BROW	N CLAY WITH SA	ND						
1	AND GRAVEL STREAK	S						VAPO	OR EXTRACTION SPARGING
	l 1	inita .		Westerda en Danvita i		Pulldinge			REMEDIATION
	1			Fences, Rivers, etc. and	attach a map. Usc addition BE ACCURATE & COM	nal paper		Ċ	THER (SPECIFY)
	1							L	
	1				R LEVEL & YIELD				WELL
	1				WATER (Ft.) B	ELOW S	URFACE	E	
	1			DEPTH OF STATIC WATER LEVEL	(Ft.) & DAT	E MEASI	IRED		
i	1				* (GPM) &				
TOTAL DEPTH OF					(Hrs.) TOTAL DRA			(Ft.)	
TOTAL DEPTH OF	COMPLETED WELL <u>1000</u>	(Feet)		May not be repr	resentative of a well's	ong-ter	m yield	ł	
		CLEINC (E)			1	Т	4 3 73 77		MATERIAL
DEPTH FROM SURFACE	BORE - TYPE (1)	CASING (S)			DEPTH FROM SURFACE		ANNU		MATERIAL
		ATERIAL / INTERNAL	GAUGE			CE-	BEN-		
Ft. to Ft.	DIA. (Inches) BITANK SCREEN BITANK BITUCION, CON, LICLON, BITANK	GRADE DIAMETER (Inches)	OR WALL		Ft. to Ft.	MENT	TONIT		FILTER PACK (TYPE/SIZE)
ZONE 1					4000 4000	(⊻)	(<u>/</u>)	$(\underline{\vee})$	
ZONE 1 0 246	14 🗸 🛛 РУС	C F480 2.5	SCH	80	1002 1200				NATIVE FILL
246 256		C F480 2.5	SCH		<u>_</u>				
256 266		C F480 2.5	SCH						
ZONE 2									
0, 510	14 V PV(SCH	80						
	IMENTS (,)		CERTIFIC	ATION STATEMEN	т			I	
Geologic Well, Co		at this report	is complete and accurat	te to the best of my knowle	dge and l	belief.			
	cal Log(s)		R CORPORA	TION) (TYPED OR PR					
	r Chemical Analysis	20 WEST KENTUC	KY AVE		WOODLAI CITY	ND		CA STATE	95695 ZIP
ATTACH ADDITIONAL I		Signed	Danio			10/05/0			C57 A HIC - 133783
DWR 188 REV. 11-97		WELL DRILLER/A		REPRESENTATIVE		ATE SIGI	NEÐ		C-57 LICENSE NUMBER

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ORIGINAL File with DWR

STATE OF CALIFORNIA THE RESOURCES AGENCY DEPARTMENT OF WATER RESOURCES WATER WELL DRILLERS REPORT

18N/02W - 36M Do not fill in

and the help his play a provident to the initial providence of the

177869 No.

State Well No.____

Notice of Intent No	WATER WELL D	RILLERS REPOR	State Well No	
Local			Other Well No	
(Total depth 455 ft. Depth of	
A		from ft. to ft. Format	ion (Describe by color, characte	r, size or material)
C		$-\frac{0}{9}$ - 39	top Sail	
(2) LOCATION OF WELL (See instruct		0	- I	lay
County COLUSA Owner's	Well Number	<u> 38 - 41</u>	Gravel	
Well address if different from above	Section 36	41 - 68	<u> </u>	lay
Township 18 N Range 2 W	SectionO	-88 - 120	JANNA & Gr	AVel
Distance from cities, roads, railroads, fences, etc.		101 - 110	AL DINE CIA	4 6
	proser of		Whiter Dr	ić K
Secion 36	······		$- v _{\text{Dive ci}}$	Ay
	(3) TYPE OF WORK:		SAND & G	TAVE!
	New Well Deepening			
	Reconstruction		Dhale & G	THUE I
	Reconditioning	<u> </u>	\sim	
	Horizontal Well	A - 1/2	S S	
	Destruction (Describe	1 <u>111 (1</u>		
	destruction materials and procedures in Item 12			***
	(4) PROPOSED USE	- (2)		· · · · · · · · · · · · · · · · · · ·
	Domestic	<u>∽</u>		
	Irrigation		- 65/1	
	Industrial	$-\infty$		
	Ten Well	\mathcal{A}		
•	Stock	$\mathcal{O} \sim \mathcal{O}$	\wedge	
	Municipal		<u>y</u>	
WELL LOCATION SKETCH	Other	$\rightarrow $		
(5) EQUIPMENT: (6) CRAVEL			• • • • • • • • • • • • • • • • • • •	
Rotary Reverse Xes. No				
Cable Z Air Dimaeter of bo				· · · · · · · · · · · · · · · · · · ·
Other D Bucket Packed from_		(//)/	······································	· · · · · · · · · · · · · · · · · · ·
(7) CASING INSTALLED: (8) PERFOR	ATIONS:	-		
	anion or size of screen			
	D TO K Stor			
from To Dia. Gage of From ft. ft. Wall ft.	ft.			· ·
O 234 NB 14 88	128 Amills Kn	- 40		
230 410 Ho 8-6A 195	2.45. Minus K	Nice -		
210	3 4 C Valman K		A-	- <u></u> ,
(9) WELL SEAL:		-	DEC	3 1985
	If yes, to depthft.	-		- 1000
Were strata sealed against pollution? Yes 🕱 No	Intervalft.	-		
Method of sealing CLAY SEAL	······································	Work started JAN 2	19_85 Completed	
(10) WATER LEVELS:	4 0 ft.	WELL DRILLER'S ST	//	0028
Depth of first water, if known	<u> </u>	This well was drilled under knowledge and belief.)	my jurisdiction and this report	is true to the best of my
Standing level after well completion		SIGNED: 2	1 att	T
Was well test made? Yes 🎉 No 🗌 If yes, by	whom? Walley Pump		(Well Driller)	1-
Type of test Pump 🛍 Bailer 🗍	Air lift []	NAME VALLEY PU	firm, or corporation) (Typed or p	
Depth to water at start of test 30 ft.	At end of test <u>56</u> ft	Address 470 No.	en. Wash Rlud	
Discharge 3400 gal/min after 90 hours	Water temperature	City LUBA Cit	u CA	zip9599
Cherry halysis made? Yes D No 🕱 If yes, by Was es, ic log made? Yes D No 🕱 If yes, at	y whom? tach copy to this report	License No. 256384	Date of this report_D	
in a manutice in the state in t	The set of			

DWR 188 (REV. 7-76) IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

s.	COT 1 9 2034					1		•
ORIGINAL			STATE OF	F CALIFOR	INIA		E ONLY	
File with DWR			COMPI	ETIO	N REPOR	τ Ι ΙΤΝΙ	mu	-00-
Page 1 of 6	7070	1	Refer to Insi			s	TATE WELL NO	D./ STATION NO.
Owner's Well No.	7679		NO.	7269)52AB			
Date Work Began		nded7/23/20						LONGITUDE
Local Permit Ag Permit No. M	gency GLENN COUNT			2004	······································	- [APN/TRS/	
Permit No.	GEOLOGIC L		Date 5/3/2	2004		-		UTIEN.
,								
DEPTH FROM	METHOD REVERSE			:R				
SURFACE Ft. to Ft.	Describe material,	CRIPTION grain, size,	color, etc.	-				
0 68	TAN BROWN CLAY				Address SOF H	WY 162 & EOF C	RATION-	· · · · · · · · · · · · · · · · · · ·
	SAND AND GRAVEL				City CA			
	TAN BROWN CLAY				County GLENN			
	TAN BROWN SILTY	CLAY			•	Page 210	Parcel 012	
	GRAVEL AND SAND					Range2_W		
1 · · · · ·	BLUE CLAY				Latitude		-	1 1
	TAN BROWN CLAY		SAND		DEG. N	NN. SEC. C ATION SKETCH-		DEG. MIN. SEC. ACTIVITY (🗹) —
	TAN BROWN SILTY					NORTH		
	TAN BROWN SILTY							MODIFICATION/REPAIR
	GRAVEL		0, 110					 Deepen Other (Specify)
	TAN BROWN CLAY V	VITH SILTY	SAND					
	TAN BROWN SILTY							 DESTROY (Describe Procedures and Materials
600 638	SANDSTONE AND CI	AYEY SAN	ID					Under "GEOLOGIC LOG")
638¦ 776	TAN BROWN SILTY (CLAY						PLANNED USES (\measuredangle) WATER SUPPLY
	GRAVEL				WEST		AST	Domestic Public Irrigation Industrial
	LIGHT TAN CLAY				3		Ē	
	SANDSTONE	_ .						TEST WELL
	LIGHT TAN CLAY WI	TH FINE SA	ND					CATHODIC PROTECTION
	GRAVEL							HEAT EXCHANGE
	TAN BROWN SILTY, GRAVEL AND SAND							INJECTION
1	CLAY			_ Y				VAPOR EXTRACTION
	BLUE SILTY SANDY							SPARGING
	BLOE GIETT GARDT					Distance of Well from Roads, attach a map. Use additiona		REMEDIATION OTHER (SPECIFY)
l	· · · · · · · · · · · · · · · · · · ·					E ACCURATE & COMP		
1					WATEF	R LEVEL & YIELD	OF COMPLI	ETED WELL
	 				DEPTH TO FIRST W	ATER (Ft.) BE	LOW SURFAC	E
1					DEPTH OF STATIC			
1						(Ft.) & DATE		
TOTAL DEPTH OF	BORING 1000 (Feet)							
TOTAL DEPTH OF	COMPLETED WELL 939.7	' (Feet)				esentative of a well's la		. ,
		-				ſ		·····
DEPTH FROM SURFACE	BORE -	CA	SING (S)			DEPTH FROM SURFACE	ANN	ULAR MATERIAL
	HOLE TYPE (*) DIA. ¥ III g	MATERIAL /	INTERNAL	GAUGE	SLOT SIZE	FROM SURFACE	CE- BEN-	TYPE
Ft. to Ft.	HOLE III L (J) HI DIA. V HI (Inches) V K HI HOLE III L (J) HI V K HI V K HI HOLE III L (J) HI V K KI V K HI V K HI V K HI V	GRADE	DIAMETER (Inches)	OR WALL	IF ANY	Ft. to Ft.	MENT TONITE	FILL FILTER PACK (TYPE/SIZE)
	ਲ਼_ ⁻ ₫ਛ		(monea)				$(\overline{\mathbf{x}})$ $(\overline{\mathbf{x}})$	
0 77	24/18 V P	VC C200	2.5	SCH 8		0 59		SAND SLURRY
77 87		VC C200	2.5	SCH 8		0 136 136 171		✓ SRI#8 SAND BENTONITE S
87 97		VC C200	2.5	SCH 8		171 265	<u> </u>	SAN#8 SAND
ZONE 2						265 829		A 25ENTONITE S
0 208	24/18 🗸 P	VC C200	2.5	SCH 8	30	829 910	U MAN	SRI#8 SAND
	MENTS (<)	1				TION STATEMENT		
Geologic Well Cor	Log Istruction Diagram	I, the undersign			s complete and accurat	e to the best of my knowle	dge and belief.	
	cal Log(s)	(PERS	ON, FIRM, OF	CORPORA	TION) (TYPED OR PRI			
	r Chemical Analysis	20 W. KEN ADDRESS	VTUCKY A	VE.			U .	CA 95695 STATE ZIP
Other ATTACH ADDITIONAL IN	IFORMATION, IF IT EXISTS.	Signed	Mastel	Dair		C	9/16/04	C57 A HIC - 133783
DWR 188 REV. 11-97					REPRESENTATIVE		TE SIGNED	C-57 LICENSE NUMBER

ORIGINAL File with DWR	WEI		of califor LETIO	RNIA N REPOF		SE ONLY	DO	NOT FILL IN
Page 2 of 6		Refer to In	struction Pa	amphlet	· · · · · · · · · · · · · · · · · · ·	TATE WELL	NO./ STA	TION NO.
Owner's Well N		No	[,] 7269	952				
Date Work Begar	7/19/2004 , Ended 7/	23/2004			LATITUDE	Ξ	Ļ	ONGITUDE
	gency GLENN COUNTY HE							
Permit No.		ermit Date 5/3	/2004	-		APN/TF	RS/OTHEF	<u>۲</u>
	——— GEOLOGIC LOG —	·······		•				
DEPTH FROM	METHOD REVERSE	- FLUID WAT	ER					
SURFACE	Descript							
Ft to $Ft0$ 68	Describe material, grain	, size, color, etc			WELL LA	OCATION-	Phase	
	SAND AND GRAVEL				WY 162 EOF	<u>/R R</u>		
	TAN BROWN CLAY			City CA				
+	TAN BROWN SILTY CLAY	-		County GLENN				
	GRAVEL AND SAND		* ** • • • • • • • •	APN Book 016	Page 210	Parcel 01	2	
	BLUE CLAY		····	-	Range ² W	Section 8		
	TAN BROWN CLAY			Latitude			DEG.	MIN. SEC.
	TAN BROWN SILTY CLAY	WITH SAND			CATION SKETCH			CTIVITY (Z) —
	TAN BROWN CLAY WITH	14718-0	·		NORTH			NEW WELL
374 462	TAN BROWN SILTY CLAY	WITH SAND					MOD	IFICATION/REPAIR
462 468	GRAVEL							Other (Specify)
468 556	TAN BROWN CLAY WITH	SILTY SAND						
556 600	TAN BROWN SILTY CLAY							DESTROY (Describe Procedures and Materials
600 638	SANDSTONE AND CLAYE	SAND						Under "GEOLOGIC LOG")
638 776	TAN BROWN SILTY CLAY							NNED USES (∠) ER SUPPLY
776¦ 796	GRAVEL			WEST		Į		Domestic Public
	LIGHT TAN CLAY			5		i	- E	Irrigation Industrial
	SANDSTONE							
	LIGHT TAN CLAY WITH FI	NE SAND					САТНО	DIC PROTECTION
	GRAVEL							HEAT EXCHANGE
	TAN BROWN SILTY, CLAYE							DIRECT PUSH
936 965	GRAVEL AND SAND WITH	BLUE TAN SI	ILTY				VAE	
	CLAY						100	SPARGING
965 1000	BLUE SILTY SANDY CLAY			Illustrate or Describe	Distance of Well from Roads,	Ruildings		REMEDIATION
1	I 			Fences, Rivers, etc. an	d attach a map. Use addition BE ACCURATE & COMI	al paper if		OTHER (SPECIFY)
······	1				····			
	I				R LEVEL & YIELD			WELL
	1 				WATER	LOW SURFA	ACE	
				DEPTH OF STATIC				
	1000				*			
TOTAL DEPTH OI			ļ	TEST LENGTH		DOWN	(Ft.)	
TOTAL DEPTH OI	COMPLETED WELL <u>939.7</u> (1	Feet)		May not be rep	resentative of a well's l	ong-term yie	eld.	
		CASING (S)]			
DEPTH FROM SURFACE	BORE - TYPE (<u><</u>)		r		DEPTH FROM SURFACE			MATERIAL
		AL / INTERNAL	GAUGE	SLOT SIZE		CE- BEN	1	YPE
Ft. to Ft.	DIA. X Z HOLD HALERI (Inches) X HOLD HALERI HALE A CONTROL HALE A	E DIAMETER (Inches)	OR WALL THICKNES		Ft. to Ft.	MENT TON		FILTER PACK (TYPE/SIZE)
200 240						(🗹) () (🗹)	
208 218 218 228	18 ✓ PVC C2		SCH 8		<u>910 1000</u>	✓	_	SAND SLURRY
TONE: 3	18 🗸 🛛 PVC C2	200 2.5	SCH 8	30	· · · · · · · · · · · · · · · · · · ·			
0, 290.6	24/18 🗸 🛛 ASTM-	35 4	.31	12	 			
290.6 299.9					1			
299.9 720.9	18 🗸 🕴 ASTM-		.31	12		++		
	HMENTS (∠)			CEDTIEIC/	TION STATEMEN			
Geologi	cLog I, the u			is complete and accur	ate to the best of my knowle		f.	
	onstruction Diagram NAM	E EATON DRIL	LING CO.	·	-	··· · <u> </u>		
	sical Log(s) ter Chemical Analysis	(PERSON, FIRM, O		TION) (TYPED OR PR	WOODLA	١D	СА	95695
Other	ADDF	RESS M		N	СПҮ		STAT	E ZIP
ATTACH ADDITIONAL	INFORMATION, IF IT EXISTS.			REPRESENTATIVE		09/16/04 TE SIGNED		C57 A HIC - 133783 C-57 LICENSE NUMBER
DWR 188 REV. 11-97	IF ADDITIONAL SPA					-		

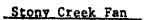
1. N							
ORIGINAL		STATE OF C	CALIFORNIA	ł		SE_ONLY	DO NOT FILL IN
File with DWR	WELL			REPOR	T		
Page 3 of 6	2020	Refer to Instruc			s	TATE WELL N	O./ STATION NO.
Owner's Well N		No. 7	2695	2			
Date Work Began	,				LATITUDE		LONGITUDE
Local Permit A	Agency GLENN COUNTY HEALT						
Permit No.	GEOLOGIC LOG	Date 5/3/200	04		L	APN/TRS	VOTHER
			ECIFY)				
DEPTH FROM		LUID WATER					
SURFACE Ft. to Ft.	DESCRIPTION Describe material, grain, size	e color etc					
	TAN BROWN CLAY		A	dragg SOF H	WY 162 & EOF C)GATION-	······
68 92	SAND AND GRAVEL			TA CA			
92 160	TAN BROWN CLAY			unty GLENN			
I	TAN BROWN SILTY CLAY			N Book 016	Page 210	Parcel 012	
	GRAVEL AND SAND				0	Section 8	
···· + ····	BLUE CLAY	······································		titude	e		
	TAN BROWN CLAY			DEG. N	MIN. SEC. C ATION SKETCH-		DEG. MIN. SEC. ACTIVITY (🖌)
	TAN BROWN SILTY CLAY WIT						ACTIVITY (♥)
	TAN BROWN CLAY WITH SAN						MODIFICATION/REPAIR
	GRAVEL	IT SAND					— Deepen — Other (Specify)
	TAN BROWN CLAY WITH SILT						Other (Specify)
	TAN BROWN SILTY CLAY						DESTROY (Describe Procedures and Materials
	SANDSTONE AND CLAYEY SA	ND					Under "GEOLOGIC LOG")
	TAN BROWN SILTY CLAY						PLANNED USES (∠)
776 796	GRAVEL		ST			ST	WATER SUPPLY Domestic Public
796; 822	LIGHT TAN CLAY		WES			EAS	Irrigation Industrial
	SANDSTONE						
	LIGHT TAN CLAY WITH FINE S	SAND					TEST WELL
	GRAVEL						HEAT EXCHANGE
	TAN BROWN SILTY, CLAYEY F						DIRECT PUSH
936 965	GRAVEL AND SAND WITH BLU	JE TAN SILTY	Y				
005 4000							SPARGING
965 1000	BLUE SILTY SANDY CLAY		Illus	strate or Describe L	SOUTH SOUTH Distance of Well from Roads,	Buildings,	REMEDIATION
	1 		Fen	ces, Rivers, etc. and	attach a map. Use additiona E ACCURATE & COMP	l paper if	OTHER (SPECIFY)
	· •			WATER	R LEVEL & YIELD (OF COMPLI	ETED WELL
					ATER (Ft.) BE		
1	l			PTH OF STATIC		LOW BURFAC	E .
	I				(Ft.) & DATE	MEASURED _	
TOTAL DEPTH OF	BORING 1000 (Feet)		1		(GPM) & T		
1	COMPLETED WELL 939.7 (Feet)		1		(Hrs.) TOTAL DRAW		
				1ay not be repre	esentative of a well's lo	ong-term yield	1
DEPTH		ASING (S)			DEPTH	ANN	ULAR MATERIAL
FROM SURFACE					FROMSURFACE		ТҮРЕ
Ft. to Ft.	HOLE TIPE (1) MATERIAL / DIA. XI 20 40 A GRADE (Inches) 20 0 0 1 4 GRADE		GAUGE R WALL	SLOT SIZE IF ANY		CE- BEN- MENT TONITE	FILTER PACK
ļ		(Inches) TH	ICKNESS	(Inches)	Ft. to Ft.	(<u>√</u>) (<u>√</u>)	(✓) (TYPE/SIZE)
720.9 730.2	18 COMP SEC	·			0 59	✓	SAND SLURRY
730.2 856.6	18 🗸 ASTM-135	4	.312		0 136		✓ SRI#8 SAND
856.6 876.6 876.6 939.7	18 ✓ DBL MILLSI 18 ✓ ASTM-135		.312	.060	136 171	✓	BENTONITE S
i	18 ✓ ASTM-135	4	.312		171 265		SRI#8 SAND
1					265 829 829 910	•	BENTONITE S
	IMENTS (∠)			CEDTURC	100 STATEMENT		SRI#8 SAND
Geologia	Log I, the undersi	igned, certify that this	s report is con		e to the best of my knowled		
	nstruction Diagram NAME E	ATON DRILLIN	G CO.				
	er Chemical Analysis 20 W. KE	ENTUCKY, AVE.			WOODLAN	D	CA 95695
Other	ADDRESS		amic-	и	CITY	9/16/04	STATE ZIP C57 A HIC - 133783
	WE	LL DRILLER/AUTHO	DRIZED REPR	RESENTATIVE	DA	TE SIGNED	C-57 LICENSE NUMBER
DWR 188 REV. 11-97	IF ADDITIONAL SPACE IS	S NEEDED, USE N	NEXT CONS	SECUTIVELY NU	JMBERED FORM		

ile with DWR			CEN 2801	XX/TOT 1		OF CALIFOR	N REPOR'	г 79/	42	<u>Ze</u> ul		SZAM
Page of		DEC	j 45 U	1334					ক্ট জনেন। ।		1963 - 7-28 U.M.C	nyezin daka.
<mark>)wner's Well No</mark> Date Work Bega		10.4	NW-I	D . 1 1 1	MI 1 1 10 1	• 581	.475				L	
Local Permit A	urency G	/94 1enn	Cour	ntv Env	<u>/11/94</u> vironm	ental I	log1+h			1 1		
Permit No.										APN/T	IS/OTHE	R
			DOIC LO			i		WEL	L OWN	E R —		
ORIENTATION (∠	X VER	TICAL	HORIZO	INTAL A	NGLE (SPECIFY)						
	DEPTH	I TO FIRS	ST WATER	(Ft.) BELOW SUP	RFACE						
DEPTH FROM SURFACE				CRIPTION								
Ft. to Ft.	7 01-		ribe materii	al, grain size, c	color, etc.			WELL				
	7' <u>Cla</u> 7' Gra		·					- 1 mi				
	7 <u>: Gra</u> 5: Cla							rners				
		y vel					punty <u>Gren</u> pM Reak 13	n	Dama	J 0		110
	1			·			or or wynchin	Page _ 2.2 Range _ <u></u>	Fare # ‡Secti	an 🤇	$\overline{\sim}$,
	5¦ Gra	vel					or atitude	NORT	- Long	on <u> </u>		·
		v						MIN. SEC. CATION SKET		,		MIN. SEC. CTIVITY (±
120 12	4 Sma	<u>11 g</u>	ravel						511			NEW WELL
		<u> </u>										FIGATION / REPAIR
			<u>cobb</u>	lestor	les	i			1.1			Deepen
<u>190 19</u>									Ľ			Other (Spec
				lestor					4			· · · ·
<u>251 26</u> 265 27	$\frac{1}{1}$ Cray	y					0 D	-(-0	121.		1 8	ESTROY (Describ Procedures and Ma
270 27	<u>1'</u> Sma	11 a	ravel						th-			Jnder "GEOLOGIC
						VEST			Elli	Hm. 4	r	(⊻) MONITORING
1									- l'ilei	vell	WATE	R SUPPLY
									61			Domestic
				•					$+\Lambda$			Public
<u>_</u>	<u> </u>								11			<u>X</u> Irrigation
	<u> </u>								11			industria
											-	"TEST WELL"
!	<u> </u>							SOUTH	<u>' </u>			CATHODIC PRI TION
	.					s	uch as Roads, Bui	be Distance of Well Idings, Fences, Rive	s, etc.	íma r ks	-	OTHER (Specif
1								CURATE & COMP.	ETE.			
						DF	NILLING ETHOD <u>Reve</u>	rse Rota:	v	. FLUID .	Wa	ter
							WATER	LEVEL & YIE				
						W.	ATER LEVEL	(Ft.)	B DATE N	IEASURI	:□	<u>L~7~9</u>
	<u> i </u>	200				E8	TIMATED YIELD	* (GPM) & TEST	TYPE _	<u>.</u>	turbin
TOTAL DEPTH O							-	(Hrs.) TOTAL			\overline{D}	Ft.)
TOTAL DEPTH O	F COMPLET	ED WEL	L	0 (Feet)			May not be repre	sentative of a well	long-terr	n yield.		
DEPTH	BORE			(CASING(S))		DEPTH		ANNU	JLAR	MATERIAI
FROM SURFACE	HOLE	TYPE			INTERNAL	GAUGE	SLOT SIZE	FROM SURFAC	→ →		1	PE
Ft. to Ft.	DIA. (Inches)	BLANK SCREEN		MATERIAL/ GRADE	DIAMETER (Inches)		IF ANY (inches)		CE MEN	BEN-	FILL	FILTER PA
Ft. to Ft.	_	2 3 °	<u>'व ह _</u>		(inclies)	THICKNESS	(inclues)	Ft. to F	() (스)	(∠)	(TYPE/SIZ
		x	++	<u>steel</u>	20	.250	-	0 3			<u> </u>	
100 + 160		x		<u>steel</u>	16	.250		35 26)	_		<u>3/8" g</u>
<u>160 260</u>) 28	X		<u>steel</u>	16		<u>, •080</u>					
	<u> </u>	╉╋				1	+			+		
		┼╂┾	-+-+		1					+	DE	<u>, i i í</u>
ATTA	CHMENTS	」				1	CERTIFICA	TION STATEN			l	
	gic Log	. ,	ļ	I, the und	ersigned, ce	ertify that this		lete and accurate		est of m	y know	
	onstruction Dia	aoram		NAME	Sullis	van Dri	lling					<u>1768 </u>
	nysical Log(s)			(PER	son, firm, or (CORPORATION) (T	11ing PED OR PRINTED)					· · · · · ·
Geop		1 Analyzan		P.O.	Box	1448		Co	ning		CA STATE	96021
	Vater Chemical	i Allalyses		ADODECC								
		i Allalyses		ADDRESS	~1	1. 0) 00.	CIT	r		JUNIE	ZIP 656504 657 LICENSE NUN

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age 1 of 1 Waner's W	(7.11 NT.	7821							·8162								1	
ate Work	Pell No.	3/15/200)5			Ender			0102				L	ATITUDE	<u>}</u> _		LO	NGITUDE
Local Pe	rmit Ao	encv G	LEN	IN	cou	NTY H	EALTH	DEPT										
Permit	No. <u>M</u>	N226-05	5				Permit	Date _2/15	5/2005			. L			AP	N/TRS/C	THER	
· · · · · · · · · · · · · · ·																-		
ORIENTATIO				TA	H	ORIZONT	AL	UID MUD	(SPECIFY)									
DEPTH F SURFA	ĊE	(D	ESCRI	PTION	, color, etc										
0		TOP SC				, 8				Addr	ess .35 MI	NOF R	ROAL	BBB &	CATI 1.5 N	nsoi	= HW	Y 162
9	20	SANDY	CL/	٩Y						City								
20		YELLO									nty GLENN							
30	42	LOOSE	SA	NE) ANE	GRA	VEL				Book 018	Page	⇒ 03C)	Parcel	032		<u>.</u>
42	64	SANDY	' BR	OV	NN C	LAY					ship 19 N				Section			
64		YELLO									ude DEG. M					_		I
70		BLUE C									DEG. M	IN.	SEC.	етсн-]	DEG.	MIN. SEC. CTIVITY (∠) -
400		SAND \									LO(- NOR						VEW WELL
425		BLUE C								ļ						.		CATION/REPAIR
494		TIGHT																Deepen
502								Y STREA	KS									Other (Specify)
750		SAND \															E	ESTROY (Describe
758		SILTY I															F	ESTROY (Describe trocedures and Materi Inder "GEOLOGIC LC
863	1010	BLUE/F	PUR	PL	E CL	AY WI	TH HAF	ND CLAY	STREAK									NNED USES (
										<u>ـ</u>						.	WATE	RSUPPLY
										WEST						EAST		omestic Public rigation Indust
					_					5						. ш		MONITORING
																		TEST WELL
)))																DIC PROTECTION
																	ł	HEAT EXCHANGE DIRECT PUSH
																		INJECTION
										ľ							VAPO	OR EXTRACTION
]								SPARGING
		·								Illustr	ate or Describe D	SOU		m Roads,	Buildings			REMEDIATION
										Fence	s, Rivers, etc. and sary. PLEASE B	attach a r	nap. U	se additiona	1 paper			DTHER (SPECIFY)
											WATEI	R LEVE	L &	YIELD	OF C	OMPL	ETED	WELL
					·			·····		DEP	TH TO FIRST V	VATER-		_ (Ft.) BE	LOW SI	JRFACE		
											TH OF STATIC							
									(ER LEVEL		•					
IOTAL DE			366	;							MATED YIELD *							
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IOTAL DE.						-	_ (1 000)			N	ay not be repr	esernany			1112-101	m yiele		
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FROM SUF		BORE - HOLE	TY	PE	(⊻)							FROM	I SUR	FACE			ΤY	PE
		DIA.	¥	SCREEN	CON- DUCTOR	MAT	TERIAL: /	INTERNAL DIAMETER	GAUGE OR WAL		SLOT SIZE IF ANY				CE-	BEN- TONITE		FILTER PACK
Ft. to	Ft.	(Inches)	BLANK	B	25	G	RADE	(Inches)	THICKNE		(Inches)	Ft.	to	Ft.		10NH (⊻)		(TYPE/SIZE)
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								aned certify th	at this report	is comp	olete and accurate	to the bes	st of my	knowledg	e and be	lief		
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		WELL LOG			
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		GRAVEL PACKED DATE COM	PLETED_		9-
hole	41/4"	TO TO' \$ 41/2" TO 700' DATE STA	=	0	
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THER DATA AV	AILABLE: WATER	LEVEL RECORD			
		ANALTUI	·		
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URFACE ELEY.		DATUM MSL GOURCE OF INFORMATION	Geol	ogist	
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	ELEV. OF	MATERIAL	THICK		
0-3'	FLEV. OF	MATENIAL	THICK NESS	SP. Visto	
<u>0-3'</u> 3-70	FLEV. OF	MATERIAL soil vellow play with some gravel	THICK	SP. Visto	
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0-3' 3-70 70-92 92-109 109-160	FLEV. OF	MATERIAL soil vellow clay with some gravel medium-small gravel graveley brown clay medium-small gravel with thin beds of fine gravel	тніск. Небр 3' 67 22 11	SP. Visto	
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0-3' 3-70 92-109 109-160 160-258 258-283	FLEV. OF	MATERIAL soil. vellew clay with some gravel medium-small gravel graveley brown clay medium-small gravel with thin beds of fine gravel sandy brown clay	Тніск. Мебя 3' 67 22 11 51 98	SP. Visto	
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0-3' 3-70 70-92 92-109 109-160 160-258 258-283 283-303 303-335 335-350	FLEV. OF	MATERIAL soil vellew clay with some gravel medium-scall gravel graveley brown clay medium-scall gravel with thin beds of fine gravel sandy brown clay coarse cond with medium-scall gravel brown clay clay	Тніск. небр 3' 67 22 11 51 98 25 20 32	SP. Visto	
0-3' 3-70 70-92 92-109 109-160 160-258 253-283 283-303 303-335 335-350 350-388	FLEV. OF	MATERIAL soil vellow clay with some gravel medium-scall gravel graveley brown clay medium-scall gravel with thin beds of fine gravel sandy brown clay coarse cond with medium-scall gravel brown clay fine good beds (thin) with brown clay coarse send and medium-scall gravel with brown clay	Тніск тевя 3' 67 22 11 51 98 25 20 32 15	SP. Visto	
0-3' 3-70 70-92 92-109 109-160 160-258 253-283 283-303 303-335 335-350 350-388 388-398	FLEV. OF	MATERIAL soil vellew clay with some gravel medium-scall gravel gravelev brean clay medium-scall gravel medium-scall gravel sandy brown clay coarse cond with medium-scall gravel brown clay clay fine sori beds (thin) with brown clay coarse sond and medium-scall gravel with brown clay brown clay with medium sand	Тніск тебр 3' 67 22 11 51 98 25 20 32 15 38	SP. Visto	
0-3' 3-70 92-109 109-160 160-258 253-283 283-303 303-335 335-350 350-388 388-398 398-405	FLEV. OF	MATERIAL soil vellew clay with some gravel medium-small gravel gravelew bream clay medium-small gravel with thin beds of fine gravel sandy 'rown clay coarse cond with medium-small 'gravel brown stady clay fine sori beds (thin) with brown clay coarse cond and medium-small gravel with brown clay brown clay with medium sand fine sand	Тніск. Мебя 3' 67 22 11 51 98 25 20 32 15 38 10	SP. Visto	
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0-3' 3-70 70-92 92-109 109-160 160-258 258-283 283-303 303-335 335-350 350-388 388-398 398-405 405-412 412-438 438-450	FLEV. OF	MATERIAL soil vellew clay with some gravel medium-scall gravel graveley brown clay medium-scall gravel with thin beds of fine gravel sandy 'rown clay coarse cond with medium-scall 'gravel brown clay clay fine sori beds (thin) with brown clay coarse send and medium-scall gravel with brown clay brown clay with medium sand fine sand fine sand with brown clay fine-coarse sand brown silty clay	Тніск. Небя 3' 67 22 11 51 98 25 20 32 15 38 10 8 7 26 12 6	SP. Visto	
0-3' 3-70 70-92 92-109 109-160 160-258 253-283 283-303 303-335 335-350 350-388 388-398 398-405 405-412 412-438 438-450 450-456	FLEV. OF	MATERIAL soil vellew clay with some gravel medium-scall gravel gravelev brown clay medium-small gravel with thin beds of fine gravel sandy 'rown clay coarse cond with medium-small 'gravel brown clay clay fine sori beds (thin) with brown clay coarse send and medium-small gravel with brown clay brown clay with medium sand fine sand fine sand with brown clay fine-coarse sand brown silty clay fine-coarse sand	Тніск. НЕБВ 3' 67 22 11 51 98 25 20 32 15 38 10 8 7 26 12 6 24	SP. Visto	
0-3' 3-70 70-92 92-109 109-160 160-258 253-283 283-303 303-335 335-350 350-388 388-398 398-405 405-412 412-438 438-400 450-456 455-480	FLEV. OF	MATERIAL soil vellew clay with some gravel medium-small gravel gravelev brean clay medium-small gravel with thin beds of fine gravel sandy brown clay coarse cond with medium-small gravel brown thady clay fine seri beds (thin) with brown clay coarse send and medium-small gravel with brown clay with medium sand fine sand fine sand with brown clay fine sand with brown clay fine coarse sand brown silty clay fine-coarse sand medium-small gravel beds (1' thick)	Тніск. Небя 3' 67 22 11 51 98 25 20 32 15 38 10 8 7 26 12 6	SP. Visto	
0-3' 3-70 70-92 92-109 109-160 160-258 253-283 283-303 303-335 335-350 350-388 388-398 398-405 405-412 412-438 438-450 450-456 455-480 280-515	FLEV. OF	MATERIAL soil vellew clay with some gravel medium-small gravel gravelev brean clay medium-small gravel with thin beds of fine gravel sandy brown clay coarse and with medium-small gravel brown thaty clay fine seri beds (thin) with brown clay coarse send and medium-small gravel with brown clay brown clay with medium sand fine sand fine sand with brown clay fine sand with brown clay fine-coarse sand brown silty clay fine-coarse sand medium-small gravel beds (1' thick) in medium sanda	Тніск. Небе 3' 67 22 11 51 98 25 20 32 15 38 10 8 7 26 12 6 24 35	SP. Visto	
0-3' 3-70 92-109 109-160 160-258 258-283 283-303 303-335 335-350 350-388 388-398 398-405 405-412 412-438 438-450 450-456 456-480 480-515 515-526	FLEV. OF	MATERIAL soil vellew clay with some gravel medium-small gravel gravelev bream clay medium small gravel with thin beds of fine gravel sandy brown clay coarse and with medium-small gravel brown thaty clay fine sand medium-small gravel with brown clay with medium sand fine sand fine sand with brown clay fine-coarse sand brown silty clay fine-coarse sand medium-small gravel beds (1' thick) in medium sand sand sand sand sand medium-small gravel beds (1' thick) in medium sand sand	Тніск. З' 3' 67 22 11 51 98 25 20 32 15 38 10 8 7 26 12 6 24 35 11	SP. Visto	
0-3' 3-70 70-92 92-109 109-160 160-258 253-283 283-303 303-335 335-350 350-388 388-398 398-405 405-412 412-438 438-450 450-456 456-480 280-515 515-526 526-578	FLEV. OF	MATERIAL soil vellew clay with some gravel medium-scall gravel gravelev brean clay medium-scall gravel with thin beds of fine gravel sandy brown clay coarse cond with medium-scall gravel brown clay with medium-scall gravel brown clay with brown clay coarse send and medium-scall gravel with brown clay with medium sand fine sand fine sand with brown clay fine coarse sand fine sand with brown clay fine-coarse sand brown silty clay fine-coarse sand medium-scall gravel beds (1' thick) in medium sand with sown clay	Тніск. небе 3' 67 22 11 51 98 25 20 32 15 38 10 8 7 26 12 6 24 35 11 52	SP. Visto	
0-3' 3-70 70-92 92-109 109-160 160-258 253-283 283-303 303-335 335-350 350-388 388-398 398-405 405-412 412-438 438-450 450-456 455-480 450-456 455-480 280-515 515-526 526-578 578-592	FLEV. OF	MATERIAL soil vellew clay with some gravel medium-stall gravel graveley brown clay medium-small gravel with thin beds of fine gravel sandy brown clay coarse and with medium-small gravel brown tady clay fine seri beds (thin) with brown clay coarse send and medium-small gravel with brown clay brown clay with medium sand fine sand fine sand with brown clay fine-coarse sand brown silty clay fine-coarse sand medium-small gravel beds (1' thick) in medium sand fire-redium sand with brown clay medium-stilty clay sinh sand fire-redium sand with brown clay	Тніск. З' 3' 67 22 11 51 98 25 20 32 15 38 10 8 7 26 12 6 24 35 11	SP. Visto	
0-3' 3-70 70-92 92-109 109-160 160-258 258-283 283-303 303-335 335-350 350-388 388-398 398-405 405-412 412-438 438-450 450-456 455-480 280-515 515-526 526-578 578-592 592-598	FLEV. OF	MATERIAL soil vellew clay with some gravel medium-stall gravel graveley brown clay medium-small gravel with thin beds of fine gravel sandy 'rown clay coarse cond with medium-small 'gravel brown tody clay fine set i beds (thin) with brown clay coarse send and medium-small gravel with brown clay brown clay with medium sand fine sand fine sand with brown clay fine-coarse sand brown silty clay fine-coarse sand medium-small gravel beds (1' thick) in medium sand brown silty clay sinh sand fire-readium sand with brown clay fine-coarse sand medium-small gravel beds (1' thick) in medium sand brown silty clay sinh sand fire-readium sand with brown clay coarse sand brown silty clay sinh sand fire-readium sand with brown clay medium coarse sand brown silty clay sinh sand fire-readium sand with brown clay medium coarse sand brown silty clay sinh sand fire-readium sand with brown clay medium coarse sand sinh brown clay	Тніск. NEGO 3' 67 22 11 51 98 25 20 32 15 38 10 8 7 26 12 6 24 35 11 52 14 6	SP. Visto	
0-3' 3-70 70-92 92-109 109-160 160-258 253-283 283-303 303-335 335-350 350-388 388-398 398-405 405-412 412-438 438-450 450-456 455-480 450-456 455-480 280-515 515-526 526-578 578-592	FLEV. OF	MATERIAL soil vellew clay with some gravel medium-stall gravel graveley brown clay medium-small gravel with thin beds of fine gravel sandy brown clay coarse and with medium-small gravel brown tady clay fine seri beds (thin) with brown clay coarse send and medium-small gravel with brown clay brown clay with medium sand fine sand fine sand with brown clay fine-coarse sand brown silty clay fine-coarse sand medium-small gravel beds (1' thick) in medium sand fire-redium sand with brown clay medium-stilty clay sinh sand fire-redium sand with brown clay	Тніск. NEGO 3' 67 22 11 51 98 25 20 32 15 38 10 8 7 26 12 6 24 35 11 52 14 6	SP. Visto	

Log # 3669



DEPARTMENT OF WATER RESOURCES

		WELL LOG	LOCAL DI	BIGNAT	ION SCF	5
BEPTH	ELEVATION OF BOTTON OF STRATUR	WATERIAL	T#+CR#888 75.57	7. 14:07	ASSOUTE VOIDE VEST	TOTA VOID FEET
624-638'		fine sand with layers of brown clay blue silty clay with fine sand	14'		-FAT Anna - Balance	
638-700		blue silty clay with fine sand	32			
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ON 102 OPIGINAL STATE OF CALIFORNIA 2011/0 File with DWR WELL COMPLETION REPORT Refer to Instruction Pamphlet . Page ____ of _ G-No. 8014484.B.C.D ORLAD REGALE Garaflen. **Owner's Well No.** Date Work Began 193/01 LATITUDE LONGITUDE . Ended. G١ Local Permit Agency APN/TRS/OTHER Permit No. MW Jao-01 Permit Date GEOLOGIC LOG ORIENTATION (스) VERTICAL HORIZONTAL ANGLE (SPECIFY) DRILLING FLUID Y METHOD _ Kota DEPTH FROM DESCRIPTION SURFACE Describe material, grain size, color, etc. WELL LOCATION. Ft. to Ft. Address Co. RA Clay 34 Ő Brown ton 70 to San 80 City Glenn 0 70 80 130 County Glenn 130 APN Book 019 Page 220 Parcel 120 Sand Q rdvo 100 290 Srown Township ht. Section . Latitude _____ 295 San 290 NORTH Longitude WEST DEG. MIN, SEC. Brow SEC. 295 445 to CTIVITY (∠) NEW WELL LOCATION SKETCH 45 445 Sand NORTH 451 1490 Brown Clas MODIFICATION/REPAIR 490 500 _ Deepen d in _ Other (Specify) Clay 500 55 Vellow tan. n Rd 515 525 Sand DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG", Yellow. Clay 525 575 San 580 575 PLANNED USES (∠) Yellow to Zan Clay WATER SUPPLY 580-630 RO Domestic Public ۲ 50 630 Z5 Irrigation _ _ Industria WEST EAST Yellow to Clay 1050-6<u>55</u> 695 Zan cona 695 705 SiH/Tuff Deposit TEST WELL Clay 705 750 CATHODIC PROTECTION Zan Brown sittere w/tuf Fragments HEAT EXCHANGE 750 805 illow DIRECT PUSH 1 Grey Siltatone 805 822 Green INJECTION 822 18401 Greg Clay VAPOR EXTRACTION Clay 240 905 Brown Hotone with SPARGING SOUTH 65 946 Sand REMEDIATION 1/ Basatt Chips Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. PLEASE BE ACCURATE & COMPLETE. 940 OTHER (SPECIFY) 950 Blue Grey 977 950 1 VolComic りょく WATER LEVEL & YIELD OF COMPLETED WELL 977 1020 Lt Green to Yellow Clay DEPTH TO FIRST WATER ____ (Ft.) BELOW SUBFACE DEPTH OF STATIC WATER LEVEL _ (Ft.) & DATE MEASURED ESTIMATED YIELD * __ (GPM) & TEST TYPE TOTAL DEPTH OF BORING (Feet) TEST LENGTH ______ (Hrs.) TOTAL DRAWDOWN_ (Ft.) TOTAL DEPTH OF COMPLETED WELL _______(Feet) * May not be representative of a well's long-term yield. CASING (S) ANNULAR MATERIAL DEPTH FROM SURFACE DEPTH BORF FROM SURFACE TYPE (ン) TYPE HOLE DIA. CON-DUCTOR FILL PIPE INTERNAL GAUGE SLOT SIZE SCREEN MATERIAL / BEN-CE-BLANK FILTER PACK OR WALL THICKNESS IF ANY (inches) (Inches) GRADE DIAMETER MENT TONITE FILL to Ft. (TYPE/SIZE) Ft. Ft. to Ft. (Inches) (⊻) (ビ) (上 00 Λ 5 <u> 100</u> 9 A ng 9.. ATTACHMENTS (≤) CERTIFICATION STATEMENT I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief. Geologic Log Explorati K Well Construction Diagram NAME CORPORATION) PRINTED (TYPED OR Geophysical Log(s) anora Soil/Water Chemical Analyses ADDRESS Other 02 Siane ATTACH ADDITIONAL INFORMATION, IF IT EXISTS. DATE SIGNE IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM DWB 188 REV. 11-97

Department of Water Resources G - M l10/15/01 - 01/23/02

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Deep Well

Ft. to Ft.	Borehole Dia.	Type	Material Grade	Internal Dia	Gauge	Slot Size
1000 - 980		Blank	Steel	2"	Sch 40	
980 - 970		Screen	Steel	2"	Sch 40	.020
970 – 930		Blank	Steel	2"	Sch 40	
930 - 920		Screen	Steel	2"	Sch 40	.020
920 - +6"		Blank	Steel	2"	Sch 40	
#2 Well						
<u>Ft. to Ft.</u>	Borehole Dia.	Type	Material Grade	Internal Dia	Gauge	Slot Size
675 655		Dlonk	Stool	່າ"	Sob 40	

<u> </u>	Dorenoie Dia.	TADC	Iviaterial Oraue	Internal Dia	Uauge	2101 2126
675 – 655	•	Blank	Steel	2"	Sch 40	
655 – 635		Screen	Steel	2"	Sch 40	.020
635 - +1		Blank	Steel	2"	Sch 40	

Middle Well

Ft. to Ft.	Borehole Dia.	Туре	Material Grade	Internal Dia	Gauge	Slot Size
545 - 525		Blank	Steel	2"	Sch 40	
526 - 515		Screen	Steel	2"	Sch 40	.020
515 - 460		Blank	Steel	2"	Sch 40	
460 - 450		Screen	Steel	2"	Sch 40	.020
450 - +2.5		Blank	Steel	2"	Sch 40	

Shallow Well

Ft. to Ft.	Borehole Dia.	Туре	Material Grade	Internal Dia	Gauge	Slot Size
201 - 180		Blank	Steel	2"	Sch 40	
180 - 170		Screen	Steel	2"	Sch 40	.020
170 - 150		Blank	Steel	2"	Sch 40	
150 - 140		Screen	Steel	2"	Sch 40	.020
140 - +2		Blank	Steel	2"	Sch 40	

Annular Material

Ft. to Ft.	Type
100 - 925	#8 Sand
925 – 917	#60 Sand
917 - 902	Hot Batch Grout
902 - 513	Cement Grout
531 - 403	#8 Sand
403 - 393	#60 Sand
393 – 283	Cement Grout
283 – 171	#8 Sand
171 – 163	#60 Sand
163 – 101	Cement Grout
101 – 35	# 8 Sand
35 - 31	#60 Sand
31 – Surface	Cement Grout

ORIGINAL STATE OF CALIFORNIA WELL COMPLETION REPORT File with DWR Refer to Instruction Pamphlet Page ____ of _ Owner's Well No. № 782025A.BLD G-2 QUAD LATITUDE Date Work Began_ , Ended Lenn CO Local Permit Agency APN/TRS/OTHER 10/1/01 Permit No. MWIZI -01 Permit Date_ ****** OTUNITIO GEOLOGIC LOG VERTICAL ORIENTATION (∠) ____ HORIZONTAL _____ ANGLE ___ (SPECIFY) DRILLING METHOD FLUID DEPTH FROM SURFACE DESCRIPTION Describe material, grain size, color, etc. Ft. Ft. WELL LOCATION 20 Sand 1954 O Address . Glenn 20 60 Brown City ____ 80 60 1 Gravel Glenn County ____ 025 -9 APN Book 019 Page 110 190 80 Clay Parcel_ Brown 190 Township 1200 Codyse Section Brown 260 250 Jay NORTH WEST Latitude. DEG. MIN. 1 Longitude . SEC. DEG. MIN SEC. 260 Sand 250 LOCATION SKETCH -ACTIVITY (∠) X NEW WELL 260 410 Blue NORTH Grey 440 Sand 410 MODIFICATION/REPAIR 450 Blue _ Deepen 440 Grey Clay CoRd 39 Other (Specify) 490 San 60 480 1510 Blue DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG" Sand 510 1520 € Grave 520 930 Blue, Grey Clay PLANNED USES (∠) WATER SUPPLY 960 San 930 _ Domestic _ Public 960 1000 Blue/ Grey Clay River Irrigation ____ Industria WEST EAST MONITORING X willow 35 TEST WELL Sal CATHODIC PROTECTION Called 44 HEAT EXCHANGE DIRECT PUSH 954 Co.Rd INJECTION 44 VAPOR EXTRACTION SPARGING REMEDIATION OTHER (SPECIFY) WATER LEVEL & YIELD OF COMPLETED WELL DEPTH TO FIRST WATER ____ ___ (Ft.) BELOW SURFACE DEPTH OF STATIC WATER LEVEL _ (Ft.) & DATE MEASURED TOTAL DEPTH OF BORING 1000 (Feet) (GPM) & TEST TYPE ESTIMATED YIELD * TEST LENGTH _ __ (Hrs.) TOTAL DRAWDOWN_ . (Et.) KO_(Feet) TOTAL DEPTH OF COMPLETED WELL * May not be representative of a well's long-term yield. CASING (S) ANNULAR MATERIAL DEPTH FROM SURFACE DEPTH FROM SURFACE BORE-HOLE DIA. TYPE (스) TYPE CON-DUCTOR INTERNAL SLOT SIZE PIPE GAUGE BEN-SCREEN MATERIAL / CE-BLANK FILTER PACK DIAMETER OR WALL THICKNESS IF ANY TONITE (Inches) MENT FILL GRADE Ft. Ft. (TYPE/SIZE) Ft. to Ft. to (inches) (inches) (⊻) (⊻) $(\leq$ ΛØ bnn2 CERTIFICATION STATEMENT ATTACHMENTS (∠) I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief. Geologic Log Onc Moration \ Well Construction Diagram NAME Geophysical Log(s) Soil/Water Chemical Analyses STATE ADDRESS Other 23 16 ATTACH ADDITIONAL INFORMATION, IF IT EXISTS. Signed SIGN IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM DWR 188 REV. 11-97

Department of Water Resources G-2

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Deep Well

Ft. to Ft.	Borehole Dia.	Type	Material Grade	Internal Dia	Gauge		Slot Size
980 - 960		Blank	Steel	2"	Sch 40		
960 - 940		Screen	Steel	2"	Sch 40	•	.020
940 - +6"		Blank	Steel	2"	Sch 40		

#2 Well

Ft. to Ft.	Borehole Dia.	Туре	Material Grade	Internal Dia	Gauge	Slot Size
490 - 470		Blank	Steel	2"	Sch 40	
470 – 460		Screen	Steel	2"	Sch 40	.020
460 - 430		Blank	Steel	2"	Sch 40	
430 - 420		Screen	Steel	2"	Sch 40	.020
420 - +1		Blank	Steel	2"	Sch 40	

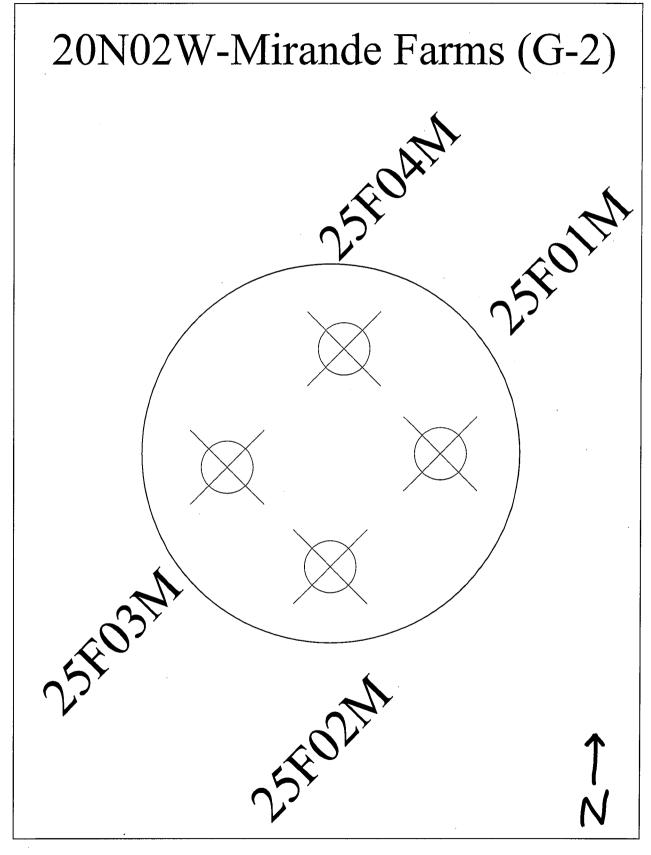
Middle Well

_	<u>Ft. to Ft.</u>	Borehole Dia.	Type	Material Grade	Internal Dia	Gauge	Slot Size
(\mathbf{y})	280 - 260		Blank	Steel	2"	Sch 40	
V	260 - 250		Screen	Steel	2"	Sch 40	.020
	250 - 200		Blank	Steel	2"	Sch 40	
	200 - 190		Screen	Steel	2"	Sch 40	.020
	190 - +2.5		Blank	Steel	2"	Sch 40	
	Shallow Well						
	Ft. to Ft.	Borehole Dia.	Type	Material Grade	Internal Dia	Gauge	Slot Size
	85 - 65		Blank	Steel	2"	Sch 40	
∇	65 – 55		Screen	Steel	2"	Sch 40	.020
	55 - +2		Blank	Steel	2"	Sch 40	

Annular Material

Ft. to Ft.	Type
985 - 925	#8 Sand
925 - 500	Cement Grout
500 - 400	#8 Sand
400 - 285	Cement Grout
285 – 170	#8 Sand
170 - 85	Cement Grout
85 – 45	#8 Sand
45 – Surface	Cement Grout



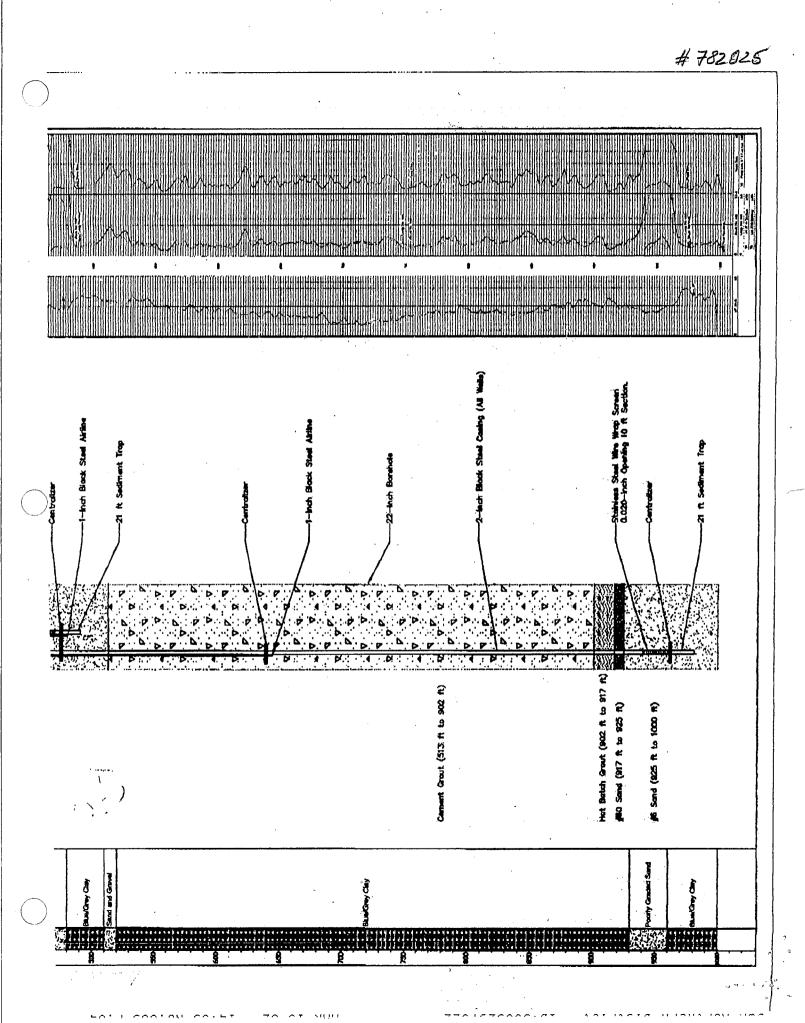


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· · · · · · · · · · · · · · · · · · ·	UTM COORDINATES LTM 165 0531134 417916	DATE COMPLETED ATZAC	LETIONS				
	CR. 52. Minore Carna. LOCATION, Sym Carrier, Carner Pa 44 and Courte Pa X.	L TOTAL DEPTH JIMOA DATE STARTED JOCAN	EMAN GROKADIM. DRUCH HELPER(S) Konner act. NUMBER OF COMPLETIONS PROJECT BURNEIMM DRIVIN 2014 COMMENTS 9.5 inch hat held storistic in sorrand materian in	Plock Steel Conductor Coning 1/4-bodh Nuclei Philomene to 35 R. Nuclei Philomene to 32 R. Nuclei Philomene to	Contraction Stand Way Screen Cutoto-Inch Operating 10 ft Sections.		Statifiene Steel Wee Wrop Screen DCC20-Huch Openhag 10 ft Sortboar.
STATE OF CALIFORNIA - RESOURCES AGENCY DEPARTMENT OF WATER RESOURCES NORTHERN DISTRICT	FEATURE CARACTER CONTINUES OF HOLE NUMBER 52	TYPE OF HOLE BANKIN MAI BOINC. TYPE OF RIG HOMENIAL	CONTRACTOR, <u>Sandrum Ecologica Inc.</u> DRUL, FOREMAN, <u>Groad A</u> INSPECTED BY <u>K. Sandr D. Sandru</u>	DESCRUPTION Comment Grout (auritees to 31 A)- Light Boom Cay Rei Cannel B Sand (31 A to 35 A) P Sand Cay Comment Grout (101 A to 163 A)	Peolo Sand (183 ft to 177 ft) Comme Gained Sand Comme Gained Sand Wei Genetict Sand Wei Genetict Sand	winsney clay Carmant Grout (283 A to 363 A)	pooly Granted Sand (383 A to 403 A) Pooly Granted Sand BlueGray Cay

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#782025



REGION		STATE OF CALIFORNIA DEPARTMENT OF WATER RESOURCES	BABIN		21.0	
COUNTY	Glenn				1232 -	33 B M
NEAR		- WELL LOG			_F - G	>
······				<u> </u>		
LOCATION	I mile west f	icon intersection of "Rd V" and "Rd 46"	and	27	<u>200'</u>	30°
of int	ersection of	"Rd 46" and irrigation road west of Le	1			
		- 10 10 - and inightion rold west of Le	wis hor	me . M	<u>est s</u>	ide of r
DRILLED BY.	Caltrons for	- OWR ADDRESS Northern Division	Red	Blu	Æ,C	<u>a.</u>
DRILLING MI	тно <u>в Ret</u>	GRAVEL PACKED VES DATE COM		8/15	רר –	8/23/7-
	10 5/8	· · · · · · · · · · · · · · · · · · ·				
SIZE OF CAS	ING DEPTH	"hole; 3" casing 0-20; 6" casing 0-320 STRUCK WAT	TER AT		<u>74'</u>	
PERFORATIO	No 100-120	-: 200 - 320 '	e [*] casin	م	_No	·
WATER LEVE				-		
		AF F F	<u> </u>			···
TEST DATA:	DIOCHARGE G. P. M.	DRAWDOWN FT	HOUR	B RUN.		
OTHER DATA	AVAILABLE: WATER	LEVEL RECORD				
	ı					
BURFACE ELE	v 103	DATUMMSLBOURCE OF INFORMATION	(Geol	oais	<u>t</u>
		GOORGE OF INFORMATION_		_	5	
DEPTH	ELEV. OF BOTTOM		тніск	ap.	.J	
DEPTH 0-8	ELEV. OF BOTTON OF STRATUM	MATERIAL	THICK		.5	······································
<u>0-8</u> 8-15'			тніск	ap.	.5	
0-8' 8-15' 15-20'	OF STRATUM	MATERIAL Sandy brown soil Brown clay Pea Grayel lense	THICK NESS	ap.		
0-8 8-15' 15-20' 20-42		MATERIAL Sandy brown soil Brown clay	THICK NESS 8'	ap.		
0-8 8-15' 15-20' 20-42 42-46		MATERIAL Sandy brown soil Brown clay Pea Grayel lense	THICK. NESS 8' 7' 5'	ap.		· · · · · · · · · · · · · · · · · · ·
0-8 8-15' 15-20' 20-42 42-46 46-70		MATERIAL Sandy brown soil Brown clay Pea Grayel lense Sandy brownish-yellow clay "Imigar gravel Brown clay, very little fine sand Sandy brown clay	THICK. NESS 8' 7' 5' 22'	ap.		
0-8 8-15' 15-20' 20-42 42-46		MATERIAL Sandy brown soil Brown clay Pea Grayel lense Sandy brownish-yellow clay "Imigar gravel Brown clay, very little fine sand Sandy brown clay Coarse sand and Dea gravel "Imigar	THICK. 8' 7' 5' 22' 4'	ap.		
0-8 8-15' 15-20' 20-42 42-46 46-70 70-84	OF STRATUM	MATERIAL Sandy brown soil Brown clay Pea Grayel lense Sandy brownish-yellow clay "Imigar gravel Brown clay, very little five sand Sandy brown clay Coarse sand and pea gravel "Imigar brown clay	THICK. NESS 8' 7' 5' 22' 4' 24'	ap.		
0-8 8-15' 15-20' 20-42 42-46 46-70 70-84 84-81	OF STRATUM	MATERIAL Sandy brown soil Brown clay Pea Grayel lense Sandy brownish-yellow clay "Iminor gravel Brown clay, very little fine sand Sandy brown clay Coarse sand and pea gravel "Iminor brown clay Brown clay	THICK. NESS 8' 7' 5' 22' 4' 24'	ap.		
$ \begin{array}{r} 0-8\\ 8-15'\\ 15-20'\\ 20-42\\ 42-46\\ 46-76\\ 70-84\\ 84-81\\ 86-92 \end{array} $	OF STRATUM	MATERIAL Sandy brown soil Brown clay Pea Gravel lense Sandy brownish-yellow clay "Iminor gravel Brown clay, very little fine sand Sandy brown clay Coarse sand and pea gravel "Iminor brown clay Brown clay Goarse sand and pea aravel	THICK. NESS 8' 7' 5' 22' 4' 24' 14'	ap.		
0-8 8-15' 15-20' 20-42 42-46 46-70 70-84 84-81 86-92 92-98	OF STRATUM	MATERIAL Sandy brown soil Brown clay Pea Grayel lense Sandy brownish-yellow clay "Imigar gravel Brown clay, very little fine sand Sandy brown clay Coarse sand and pea gravel "Imigar brown clay Brown clay Brown clay Brown clay Brown clay Sandy brown clay Sandy brown clay Sandy brown clay Coarse sand and pea gravel Brown clay Source sand and pea gravel	THICK. NESS 8' 7' 5' 22' 4' 24' 14' 14'	ap.		
0-8 8-15' 15-20' 20-42 42-46 46-70 70-84 84-81 86-92 98-120	OF STRATUM	MATERIAL Sandy brown soil Brown clay Pea Grayel lense Sandy brownish-yellow clay "Imigar gravel Brown clay, very little fine sand Sandy brown clay Coarse sand and pea gravel "Imigar brown clay Brown clay Brown clay Brown clay Brown clay Sandy brown clay Sandy brown clay Sandy brown clay Coarse sand and pea gravel Brown clay Source sand and pea gravel	THICK. NESS 8' 7' 5' 22' 4' 24' 14' 24' 14'	ap.		
0-8 8-15' 15-20' 20-42 42-46 46-70 70-84 84-81 86-92 92-98	OF STRATUM	MATERIAL Sandy brown soil Brown clay Pea Gravel lense Sandy brownish-yellow clay "Iminor gravel Brown clay, very little fine sand Sandy brown clay Coarse sand and pea gravel "Iminor brown clay Brown clay Goarse sand and pea gravel Brown silty clay Coarse sand and pea gravel Sandy clay (red-brown area-brown and	THICK. NESS 8' 7' 5' 22' 4' 24' 14' 24' 14' 24' 14' 24' 14'	ap.		
$ \begin{array}{r} 0-8\\ 8-15'\\ 15-20'\\ 20-42\\ 42-46\\ 46-76\\ 70-84\\ 84-86\\ 84-86\\ 86-92\\ 92-98\\ 98-126\\ 120-14\\ \end{array} $	OF STRATUM	MATERIAL Sandy brown soil Brown clay Pea Gravel lense Sandy brownish-yellow clay "Iminor gravel Brown clay, very little fine sand Sandy brown clay Coarse sand and pea gravel "Iminor brown clay Brown clay Goarse sand and pea gravel Brown silty clay Coarse sand and pea gravel Brown silty clay Coarse sand and pea gravel Sandy clay (red-brown, green-brown, and buff - brown, green-brown, and	THICK 8' 7' 5' 22' 4' 24' 14' 2' 6' 22' 4'	ap.		
$ \begin{array}{r} 0-8\\ 8-15'\\ 15-20'\\ 20-42\\ 42-46\\ 46-76\\ 70-84\\ 84-81\\ 84-81\\ 86-92\\ 98-126\\ 98-126\\ 120-14\\ 144-166 \end{array} $	OF STRATUM	MATERIAL Sandy brown soil Brown clay Pea Gravel lense Sandy brownish-yellow clay "Imigor gravel Brown clay, very little fine sand Sandy brown clay Coarse sand and pea gravel "Imigor brown clay Brown clay Brown clay Brown clay Goarse sand and pea gravel Brown silty clay Coarse sand and pea gravel Brown silty clay Coarse sand and pea gravel Sandy clay (red-brown green-brown, and buff-brown) Silty clay (red-brown and green-brown)	THICK. NESS 8' 7' 5' 22' 4' 24' 14' 2' 6' 22' 24' 14' 2' 4' 24' 14' 2' 4' 2' 4' 2' 4' 14'	ap.		
$ \begin{array}{r} 0-8\\ 8-15'\\ 15-20'\\ 20-42\\ 42-46\\ 46-76\\ 70-84\\ 84-81\\ 86-92\\ 98-126\\ 120-14\\ 144-166\\ 160-17 \end{array} $	OF STRATUM	MATERIAL Sandy brown soil Brown clay Pea Gravel lense Sandy brownish-yellow clay "Imigar gravel Brown clay, very little fine sand Sandy brown clay Coarse sand and pea gravel "Imigar brown clay Brown clay Brown clay Coarse sand and pea gravel Brown sitty clay Coarse sand and pea gravel Brown sitty clay Coarse sand and pea gravel Sandy clay (red-brown green-brown, and buff-brown and green-brown) Pea oraxel	THICK NESS 8' 7' 5' 22' 4' 24' 14' 2' 6' 22' 24' 14' 22' 24' 14' 10'	ap.		
$ \begin{array}{r} 0-8\\ 8-15'\\ 15-20'\\ 20-42\\ 42-46\\ 46-76\\ 70-84\\ 84-81\\ 84-81\\ 86-92\\ 98-126\\ 98-126\\ 120-14\\ 144-166 \end{array} $	OF STRATUM	MATERIAL Sandy brown soil Brown clay Pea Gravel lense Sandy brownish-yellow clay "Iminor gravel Brown clay, very little fine sand Sandy brown clay Coarse sand and pea gravel "Iminor brown clay Coarse sand and pea gravel Brown clay Coarse sand and pea gravel Brown clay Coarse sand and pea gravel Brown sitty clay Coarse sand and pea gravel Brown sitty clay Coarse sand and pea gravel Sandy clay (red-brown, green-brown, and buff-brown) Silty clay (red-brown and green-brown) Pea gravel Silty clay "Iminor fine sand (green-black	THICK. NESS 8' 7' 5' 22' 4' 24' 14' 2' 6' 22' 24' 14' 2' 4' 24' 14' 2' 4' 2' 4' 2' 4' 14'	ap.		
$\begin{array}{r} 0-8\\ 8-15'\\ 15-20'\\ 20-42\\ 42-46\\ 46-76\\ 70-84\\ 84-86\\ 84-86\\ 84-86\\ 86-92\\ 92-98\\ 98-126\\ 120-14\\ 144-166\\ 160-17\\ 170-18\\ \end{array}$	OF STRATUM	MATERIAL Sandy brown soil Brown clay Pea Gravel lense Sandy brownish-yellow clay "Iminor gravel Brown clay, very little fine sand Sandy brown clay Coarse sand and pea gravel "Iminor brown clay Coarse sand and pea gravel Brown clay Coarse sand and pea gravel Brown silty clay Coarse sand and pea gravel Brown silty clay Coarse sand and pea gravel Sandy clay (red-brown, green-brown, and buff- brown) Silty clay (red-brown and green-brown) Pea gravel Silty clay "Iminor fine sand (green-black and areen-brown)	THICK. NESS 8' 7' 5' 22' 4' 24' 14' 24' 24' 22' 24' 24' 16' 10' 10' 18'	ap.		
$\begin{array}{r} 0-8\\ 8-15'\\ 15-20'\\ 20-42\\ 42-46\\ 46-76\\ 70-84\\ 84-81\\ 84-81\\ 86-92\\ 92-98\\ 98-126\\ 120-14\\ 144-166\\ 160-17\\ 170-18\\ 188-198\end{array}$	OF STRATUM	MATERIAL Sandy brown soil Brown clay Pea Gravel lense Sandy brownish-yellow clay "Iminor gravel Brown clay, very little fine sand Sandy brown clay Coarse sand and pea gravel "Iminor brown clay Coarse sand and pea gravel Brown clay Coarse sand and pea gravel Brown clay Coarse sand and pea gravel Brown silty clay Coarse sand and pea gravel Sandy clay (red-brown, green-brown, and buff-brown) Silty clay (red-brown and green-brown) Pea gravel Silty clay "Iminor fine sand (green-black and green-brown) Greenish-brown clay	THICK. NESS 8' 7' 5' 22' 4' 24' 14' 24' 24' 24' 22' 24' 24' 16' 10' 18'	ap.		
$\begin{array}{r} 0-8\\ 8-15'\\ 15-20'\\ 20-42\\ 42-46\\ 46-76\\ 70-84\\ 84-86\\ 84-86\\ 84-86\\ 86-92\\ 92-98\\ 98-126\\ 120-14\\ 144-166\\ 160-17\\ 170-18\\ \end{array}$	OF STRATUM	MATERIAL Sandy brown soil Brown clay Pea Gravel lense Sandy brownish-yellow clay "Iminor gravel Brown clay, very little fine sand Sandy brown clay Coarse sand and pea gravel "Iminor brown clay Coarse sand and pea gravel Brown clay Coarse sand and pea gravel Brown silty clay Coarse sand and pea gravel Brown silty clay Coarse sand and pea gravel Sandy clay (red-brown, green-brown, and buff-brown) Silty clay (red-brown and green-brown) Pea gravel Silty clay "Iminor fine sand (green-black and green-brown) Greenish-brown clay Red-brown and green-brown clayer	THICK. NESS 8' 7' 5' 22' 4' 24' 14' 24' 24' 22' 24' 24' 16' 10' 10' 18'	ap.		
$\begin{array}{r} 0-8\\ 8-15'\\ 15-20'\\ 20-42\\ 42-46\\ -76\\ 70-84\\ 84-81\\ 86-92\\ -92\\ -92\\ -92\\ -92\\ -92\\ -92\\ -92\\ $	OF STRATUM	MATERIAL Sandy brown soil Brown clay Pea Gravel lense Sandy brownish-yellow clay "Iminor gravel Brown clay, very little fine sand Sandy brown clay Coarse sand and pea gravel "Iminor brown clay Coarse sand and pea gravel Brown clay Coarse sand and pea gravel Brown silty clay Coarse sand and pea gravel Brown silty clay Coarse sand and pea gravel Sandy clay (red-brown, green-brown, and buff-brown) Silty clay (red-brown and green-brown) Pea gravel Silty clay "Iminor fine sand (green-black and green-brown) Greenish-brown clay Red-brown and green-brown clayer	THICK. NESS 8' 7' 5' 22' 4' 24' 14' 24' 24' 22' 24' 14' 22' 24' 10' 10' 18' 10' 18'	ap.		
$\begin{array}{r} 0-8\\ 8-15'\\ 15-20'\\ 20-42\\ 42-46\\ 46-76\\ 70-84\\ 84-81\\ 86-92\\ 92-98\\ 98-126\\ 120-14\\ 144-166\\ 160-17\\ 170-18\\ 188-198\\ 198'-218\\ 218-22\\ \end{array}$	OF STRATUM	MATERIAL Sandy brown soil Brown clay Pea Gravel lense Sandy brownish-yellow clay "Iminor gravel Brown clay, very little fine sand Sandy brown clay Coarse sand and pea gravel "Iminor brown clay Brown clay Brown clay Coarse sand and pea gravel Brown sitty clay Coarse sand and pea gravel Brown sitty clay Coarse sand and pea gravel Sandy clay (red-brown, green-brown, and buff-brown) Sitty clay (red-brown and green-brown) Pea gravel Sitty clay "Iminor fine sand (green-black and green-brown) Greenish-brown clay Red-brown and green-brown clayey Sand "Iminor pea gravel lenses Greenish brown clay	THICK. NESS 8' 7' 5' 22' 4' 24' 14' 2' 4' 24' 14' 2' 4' 24' 14' 2' 4' 24' 14' 2' 10' 10' 10' 10' 20' 5'	ap.		
$\begin{array}{c} 0-8\\ 8-15'\\ 15-20'\\ 20-42\\ 42-46\\ 46-76\\ 70-84\\ 84-81\\ 86-92\\ 92-98\\ 98-126\\ 120-14\\ 144-166\\ 160-17\\ 170-18\\ 188-198\\ 198'-218\\ 218-223\\ 223-236\end{array}$	OF STRATUM	MATERIAL Sandy brown soil Brown clay Pea Gravel lense Sandy brownish-yellow clay "Iminor gravel Brown clay, very little fine sand Sandy brown clay Coarse sand and pea gravel "Iminor brown clay Brown clay Coarse sand and pea gravel Brown sitty clay Coarse sand and pea gravel Brown sitty clay Coarse sand and pea gravel Brown sitty clay Coarse sand and pea gravel Sandy clay (red-brown, green-brown, and buff-brown) Sitty clay (red-brown and green-brown) Pea gravel Sitty clay "Iminor fine sand (green-black and green-brown) Greenish-brown clay Red-brown and green-brown clayey Sand "Iminor pea gravel lenses Greenish brown clay Greenish brown clay	THICK. NESS B' 7' 5' 22' 4' 24' 14' 2' 4' 24' 14' 2' 4' 24' 14' 2' 4' 24' 14' 2' 4' 2' 4' 2' 4' 2' 4' 2' 4' 2' 4' 2' 5' 13'	ap.		
$\begin{array}{c} 0-8\\ 8-15'\\ 15-20'\\ 20-42\\ 42-46\\ 46-76\\ 70-84\\ 84-81\\ 86-92\\ 92-98\\ 98-126\\ 120-14\\ 120-14\\ 144-166\\ 160-17\\ 170-18\\ 188-198\\ 198'-218\\ 188-198\\ 198'-218\\ 218-223\\ 236-24\\ \end{array}$	OF STRATUM	MATERIAL Sandy brown soil Brown clay Pea Gravel lense Sandy brownish-yellow clay "Iminor gravel Brown clay, very little fine sand Sandy brown clay Coarse sand and pea gravel "Iminor brown clay Brown clay Brown clay Coarse sand and pea gravel Brown sitty clay Coarse sand and pea gravel Brown sitty clay Coarse sand and pea gravel Sandy clay (red-brown, green-brown, and buff-brown) Silty clay (red-brown and green-brown) Pea gravel Silty clay "Iminor fine sand (green-block and green-brown) Greenish-brown clay Red-brown clay Coarse sand and green-brown clayey sand winnor pea gravel lenses Greenish brown clay Greenish brown clay Sand Pea Gravel	THICK. NESS B' 7' 5' 22' 4' 24' 14' 2' 4' 24' 14' 2' 4' 22' 24' 16' 10' 18' 10' 18' 10' 18' 10' 13' 4'	ap.		
$\begin{array}{c} 0-8\\ 8-15'\\ 15-20'\\ 20-42\\ 42-46\\ 46-76\\ 70-84\\ 84-81\\ 86-92\\ 92-98\\ 98-126\\ 120-14\\ 144-166\\ 160-17\\ 170-18\\ 188-198\\ 198'-218\\ 218-223\\ 223-236\end{array}$	OF STRATUM	MATERIAL Sandy brown soil Brown clay Pea Gravel lense Sandy brownish-yellow clay "Iminor gravel Brown clay, very little fine sand Sandy brown clay Coarse sand and pea gravel "Iminor brown clay Coarse sand and pea gravel Brown clay Coarse sand and pea gravel Brown sitty clay Coarse sand and pea gravel Sandy clay (red-brown, green-brown, and buff-brown) Sitty clay (red-brown and green-brown) Pea gravel Sitty clay "Iminor fine sand (green-black and green-brown) Greenish-brown clay Red-brown and green-brown clayey sand "Iminor pea gravel lenses Greenish brown clay Greenish brown clay Servenish brown clay	THICK. NESS B' 7' 5' 22' 4' 24' 14' 2' 4' 24' 14' 2' 4' 22' 24' 16' 10' 18' 10' 18' 10' 18' 10' 13' 4'	ap.		
$\begin{array}{c} 0-8\\ 8-15'\\ 15-20'\\ 20-42\\ 42-46\\ 46-76\\ 70-84\\ 84-81\\ 84-81\\ 84-92\\ 92-98\\ 98-126\\ 120-14\\ 120-14\\ 144-166\\ 160-17\\ 170-18\\ 188-198\\ 198'-218\\ 218-22\\ 223-236\\ 236-24\\ 240-26\\ \end{array}$		MATERIAL Sandy brown soil Brown clay Pea Grayel lense Sandy brownish-yellow clay "Iminor gravel Brown clay, very little fine sand Sandy brown clay Coarse sand and pea gravel "Iminor brown clay Coarse sand and pea gravel Brown clay Coarse sand and pea gravel Brown sitty clay Coarse sand and pea gravel Brown sitty clay Coarse sand and pea gravel Sandy clay (red-brown, green-brown, and buff-brown) Silty clay (red-brown and green-brown) Pea gravel Silty clay (red-brown and green-brown) Pea gravel Silty clay "Iminor fine sand (green-black and green-brown) Greenish-brown clay Red-brown and green-brown clayey sand "Iminor pea gravel lenses Greenish brown clay Greenish brown clay Sereenish brown clay	THICK. NESS B' 7' 5' 22' 4' 24' 14' 2' 4' 24' 14' 2' 4' 22' 24' 16' 10' 18' 10' 18' 10' 18' 10' 13' 4'	ap.		
$\begin{array}{c} 0-8\\ 8-15'\\ 15-20'\\ 20-42\\ 42-46\\ 46-76\\ 70-84\\ 84-81\\ 84-81\\ 86-92\\ 92-98\\ 98-126\\ 120-14\\ 144-166\\ 160-17\\ 170-18\\ 188-198\\ 198'-218\\ 218-223\\ 223-236\\ 236-24\\ 240-26\\ 260-26\\ 260-26\\ \end{array}$		MATERIAL Sandy brown soil Brown clay Pea Gravel lense Sandy brownish-yellow clay "Iminor gravel Brown clay, very little fine sand Sandy brown clay Coarse sand and pea gravel "Iminor brown clay Coarse sand and pea gravel Brown clay Coarse sand and pea gravel Brown sitty clay Coarse sand and pea gravel Brown sitty clay Coarse sand and pea gravel Sandy clay (red-brown, green-brown, and buff-brown) Sitty clay (red-brown and green-brown) Pea gravel Sitty clay "Iminor fine sand (green-black and green-brown) Greenish-brown clay Red-brown and green-brown clayey sand "Iminor pea gravel lenses Greenish brown clay Sereenish brown clay S	THICK. NESS 8' 7' 5' 22' 4' 24' 14' 2' 4' 24' 14' 2' 4' 10' 10' 10' 10' 13' 4' 20' 13' 4' 20'	ap.		
$\begin{array}{c} 0-8\\ 8-15'\\ 15-20'\\ 20-42\\ 42-46\\ 46-76\\ 70-84\\ 84-81\\ 84-81\\ 84-92\\ 92-98\\ 98-126\\ 120-14\\ 120-14\\ 144-166\\ 160-17\\ 170-18\\ 188-198\\ 198'-218\\ 218-22\\ 223-236\\ 236-24\\ 240-26\\ \end{array}$	OF STRATUM	MATERIAL Sandy brown soil Brown clay Pea Grayel lense Sandy brownish-yellow clay "Iminor gravel Brown clay, very little fine sand Sandy brown clay Coarse sand and pea gravel "Iminor brown clay Coarse sand and pea gravel Brown clay Coarse sand and pea gravel Brown sitty clay Coarse sand and pea gravel Brown sitty clay Coarse sand and pea gravel Sandy clay (red-brown, green-brown, and buff-brown) Silty clay (red-brown and green-brown) Pea gravel Silty clay (red-brown and green-brown) Pea gravel Silty clay "Iminor fine sand (green-black and green-brown) Greenish-brown clay Red-brown and green-brown clayey sand "Iminor pea gravel lenses Greenish brown clay Greenish brown clay Sereenish brown clay	THICK. NESS B' 7' 5' 22' 4' 24' 14' 2' 4' 24' 14' 2' 4' 10' 10' 10' 10' 10' 10' 10' 10' 10' 10' 10' 10' 13' 4'	ap.		

FORM 263A

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INVESTIGATION

STATE OF CALIFORNIA DEPARTMENT OF WATER RESOURCES

NUMBER SCF-6

SHEET 2

	ELEVATION OF	WELL LOG	LOCAL D	BIGNAT	10N	
3297H	Betton AF STRATUN	MATERIAL	THICKNESS	% V0194	ABSOLUTE	TOTA VOID FEET
282-288		Silty buff clay	·++		788T	PEET
<u>-288 · 310</u>		Pea acavel and coarse said	22'		++	
<u>310 - 326</u>		Brown clayey gravel (no water)	16'		┢╸━━╾┤╴	
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		* Note: There is a 10' section of drill	+			
		pipe at the bottom of this hole.	+		┝╌╾╍╼╧┠╸	<u> </u>
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L ENGINEERING, NC. WELL LOG WELL LOG UNIT C and BLUFF, DISt. ARCE Red BLUFF, DISt. ARCE Red BLUFF, DISt. Iset Hole Me. Izu Last Hole Me. Num Num Num Num Num Num Num Num Num Num	
APPLIEDGEOLOGICAL FUGINEERING, INC. APPLIEDGEOLOGICAL FUGINEERING, INC. ELECTRICAL WELL LOG Company CALIFORNIA STATE DIVISION OF MATER RESOLARCE Red BLUFF, DIBLA. Company CALIFORNIA STATE DIVISION OF MATER RESOLARCE Red BLUFF, DIBLA. Company CALIFORNIA STATE DIVISION OF MATER RESOLARCE Red BLUFF, DIBLA. Company CALIFORNIA STATE DIVISION OF MATER RESOLARCE Red BLUFF, DIBLA. Company California State La. Elevation 120 Logenia AU Logenia fremical - 20 Location 20 Logenia AU Rister II 0 Company Logenia V Tomp Preuraen Rister II 0 COMPANY AU CALIFORNIA AU RISTER II Ster	

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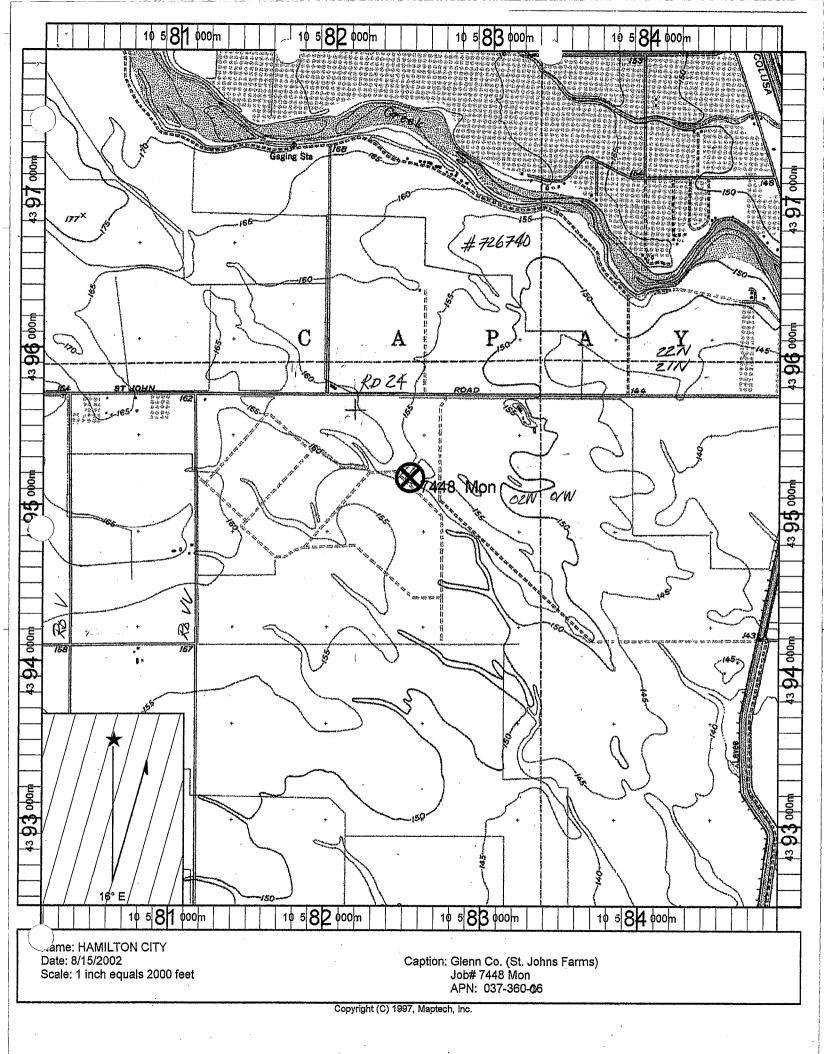
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Page 1 of 1		0400				-	nstruction	*	····	STATE		O./ STA	TION NO.
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Local P	ermit A	gency (JLEN	N CO	UNTY HEALT		4/0007				APN/TRS		
Permi		W 280-0		LOG	IC LOG —	t Date <u>5/3</u>	51/2007			01177			·
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130	140	SAND	AND	GRA	VĖL			APN Book 020		Dorra	-1 008		
140	250	YELLO	W BF	ROW	V CLAY WITH	SAND ST	REAKS	Township 20 N	Range3 W	_ Parci _ Secti			
250	260	SAND	AND	GRA	VEL								<u></u>
260	310	YELLO	W BF	ROW	N CLAY WITH	SAND ST	REAKS	DEG.		_	-	DEG.	
310	465			NOS	N CLAY WITH	SAND AN	D ,		CATION SKETCE				CTIVITY (Z) — New Well
	· ·	GRAVE										1	FICATION/REPAIR
465					VEL WITH BLU	JE CLAY							Deepen
485		SAND											Other (Specify)
500					H SAND	· · · · ·							
530	625				OW CLAY MIX	WITH SA	ND						DESTROY (Describe Procedures and Material Under "GEOLOGIC LOG
					REAKS								NNED USES (\checkmark)
625	700			GRA	VEL WITH YEL	LOW AND	O BLUE	н ,				WATE	R SUPPLY
		CLAY						WES			AST		Domestic Public rrigation Industria
700¦	865				NAND BLUE C	LAY MIX	WITH	\$			ш		
		SAND			and the second state of th	0 D 4 1 / D 1						· .	TEST WELL
865					H SAND AND	GRAVEL	STREAK						DIC PROTECTION
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1,000		GRAVE		Ovv C		ITTI SANL		Illustrate or Describe I	Distance of Well from Roads	Building	3 <i>s</i> ,]	REMEDIATION
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1000	1400			`	······			WATE	R LEVEL & YIELI	OF C	OMPL	ETED	WELL
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-		cal Log(s <u>)</u>	۰.	_		RSON, FIRM, C T KENTU C		TION) (TYPED OR PR			-		05005
	Soil/Wate Other	r Chemical	Analysi	s 	ADDRESS	MM		•	WOODLA CITY			CA STATE	95695 ZIP
ATTACH ADE		FORMATIC	N, IF IT	EXIST	S. Signed	Carts		REPRESENTATIVE		07/06/			C57 A HIC - 13378 C-57 LICENSE NUMBE
DWR 188 REV.	11-97							CONSECUTIVELY			~1100		S ST LIGENGE NUMBER

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		0/0						ICS, TUFF			īD	Illustrate or Describ Fences, Rivers, etc. a	e Distan	ce of Well	from Roads, I Use additiona	Buildings I paper	, if		OTHER (SPECIFY)
	370	380	COAR						1			necessary. PLEASE	BE A	CURATI	E & COMI	LETE.		L	
	380	450	TUSCA	N A	١N	D ME	TAN	IORPHIC I	RCK W/	SND, CL	Y.	WAT	ER L	EVEL &	& YIELD	OF C	OMPL	ETED) WELL
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			CHERT	•								DEPTH OF STAT	с 		(Ft.) & DATE	MEASL	RED _		
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	TOTAL DE						Feet)	¥.				TEST LENGTH		(Hrs.) TC	TAL DRAW	DOWN.		(Ft.)	
	TOTAL DE	PTH OF	COMPLE	TED	WE		10	(Feet)				May not be rep	presen	tative of	f a well's lo	ong-ter	m yield	d	
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,	Ft. to	Ft.	(Inches)	BLANK	REE	CON- DUCTOR		MATERIAL / GRADE	DIAMETE		ALL	IF ANY		Ft. to	. =+	CE- MENT	BEN- TONITI	FILL	FILTER PACK (TYPE/SIZE)
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		ATTAC: Geologic	HMENTS Log	(⊻)	-			I, the undersid	ned, certify	that this repo	ort is	CERTIFIC complete and accura				I. —			
()		Well Co	nstruction Di	agrar	n			NAME EA	ATON DR	RILLING	0.	ION) (TYPED OR P							·
			ical Log(s) er Chemical	Anal	ysis			20 W. KE	NTUCKY	1 Al	/			<u> </u>		1D		CA	95695
	ATTACH ADI	Other		NI 15	17 **	VICTO	-	Signed	<u> </u>	YUI						0/03/0		STATE	133783-C57A
	DWR 188 REV.		- ORWATIO	, ¥, <i>¥</i> ["				WEL	L DRILLER	AUTHORIZ		REPRESENTATIVE ONSECUTIVELY	NUMF	BERED		TE SIGI	IED		C-57 LICENSE NUMBER

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\sim	Date Wo						Ended 9/6/20	02			•		LATITUDE		4 L	LC	DNGITUDE
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	Perm	it No. <u>N</u>	<u>1W-139-0</u>	<u>)2</u>			LOG Permit	Date _8/2	1/2002			. I			-14/17(3)	OTHEN	
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										nec	essary. PLEASE BE	ACCURAT	E & COM	LETE.	ш		
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			BORING				et)			1	ST LENGTH	• •					
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	DEF	TH	BORF -				C	ASING (S)	·			DEI FROM SI	TH		ANNU		MATERIAL
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	Ft. to	Ft.	(Inches)	BLANK	SCREEN CON-		GRADE	DIAMETER (Inches)		L	IF ANY (Inches)	Ft. te	o Ft.	MENT	TONITE		FILTER PACK (TYPE/SIZE)
	0	230	12		<u>ŭ</u> <u>č</u>			ļ				0	220	(<u>∠)</u> ✓	(<u><</u>)	(⊻)	SAND SLURRY
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\frown	,	— Geologic Well Cor	: Log nstruction Di	ladram	1		I, the undersig	ned, certify th	at this report i	is com).	nplete and accurate t				ellef.		
\bigcirc	" -	Geophys	ical Log(s)	-			(PER	SON, FIRM, C	RCORPORA	ATION	I) (TYPED OR PRIN			חו		CA	95695
		Soil/Wate 	er Chemical	Analy	sis					1		V	VOODLAN CITY			CA STATE	ZIP
	ATTACH AL		NFORMATIO	N, IF I	T EXIS	STS.		L DRILLER/A		REP	RESENTATIVE		<u>1</u>	0/03/0	VED		133783-C57A C-57 LICENSE NUMBER
	DWR 188 RE	V. 11-97			IF A	DDIT	IONAL SPACE IS	NEEDED,	USE NEXT	CON	SECUTIVELY NU	MBERED	FORM				



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File with DWR	WELL COMPLETIC		1	
Page 1 of 2	Relief to Instruction :		STATE WALLAN	o státich féo 👘 👘
Owner's Well Nn, 7448-2	^{No.} 726	741 /-		
	ndei 9/6/2002	, - r i	Éconocé.	LONG TUDE
Local Fernit Agency GLERN ONTY F				
Format No. MW-139-02			AP5 1765	OFWER
GEOLOGIC L	Percat Date 8/21/2002			
G201003C I.		•		
ORENTALEN (*) VERTEA - ORE	ZORITAL ADOLE (SPECIEN)			
DRILLING ROTARY DEPT-FOOL METHOD ROTARY	=cue MUD			
SURFACE DES	CRIPTION			
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0 20 WELL GRADED SAN		City CA		
20 50 POORLY GRADED S		County GLENN		
50 60 POORLY GRADED S	ND AND GRV1 WITAN CLY	AFN Book 037	Page 360 Parcel 050	
60 70 POORLY GRADED S	AND WITH GRAVEL	Fownship 22 N	Range 2 W Nection 25	
70 80 PCORLY GRADEO G	RAVEL	Labrade	hange in the hange	
50 100 GRAY/BROWN CLAY	WITH SAND ANO GRAVEL	DEO MIN		DEG MAR GEC
100 110 POORLY GRADED S.	and	LOC'A	TION SKETCH	ACTIVITY
110 120 POORLY GRADED SA	AND WITH FINE GRAVEL		101	L M NEW WEG
120 150 POORLY GRADED G	RAVEL			MODIFICATION REPAIR Device
150 160 GRAVELAND SAND	WYELLOW STICKY CLAY			 - Capaci Sovichy
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	RAVEL W/SAND AND CLÂY			CESTRON Darable Prior dynamic a Martinet
200 230 YELLOW CLAY WITH		Ì		Rister durit vich di Marchan Number 1650: 0600 0001
230 240 YELLOW SILTY CLAY				PLANNED USES(<)
240 250 YELLOW SILTY CLAY		5	-	WARER 30, PEU) Corresponde Public
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300 310 GRAVEL WITH FINE	SAND			12501.00
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LOCAL DEPOLOCIÓN MEDIO WELL 124	(Live)		apples of a cell's hong-required.	
0E210 8086 -	CASING (S)			LAR MALFRING
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이유 방법 전문 (Although Hold Real (Although Hold Real) (Although Hold Real) (Althoug	SRADE DAMETER OF WAL	. E A57	DEN BENA MENT TOUTS	E Four FRITE FRITE
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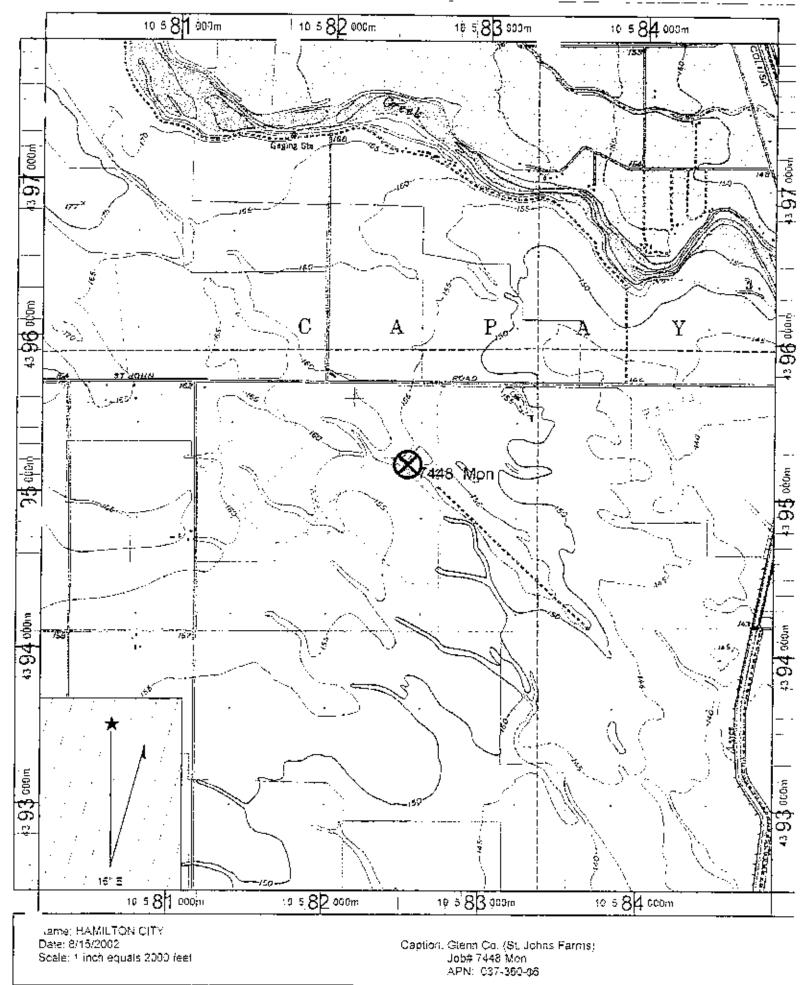
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				Refer to Instru		•		ATE WELL NO	/ STATION NO.
Page 9 of 1 Owner's `	.2 Well No.	7987			E044	112			
Date Work	Began	7/12/2006	Ended 7/28/2	006	<u> </u>			1 1 1	
Local P	ermit Ag	ency GLENN COUR	<u>TY HEALIE</u> Permit	<u>1 DEPI</u>	2006			APN/TRS/	DTHER
Permi	t No. 101	GEOLOGIC	LOG						
ORIENTAT	'ION (⊻)				PECIFY)				
DEPTH	rrow	DRILLING ROTARY	ESCRIPTION						
SURF/ Ft. to	Ft.	Describe mater		e, color, etc.			WELL LO	CATION	
0		TOP SOIL	······································				OF RD 24 & .67 M	TEOF RD	<u>S</u>
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110		YELLOW BROWN				County GLENN APN Book 023	Dogo 220	Parcel 005	
150	290	YELLOW BROWN	CLAY WITH	SAND AND	:	Township 21 N	$- \operatorname{Range}^2 W$	Section A	18
		GRAVEL				Latitude		_	<u> </u>
290		LOOSE GRAVEL W				DEG. MI	N. SEC. ATION SKETCH -		DEG. MIN. SEC. ──ACTIVITY (⊻) ──
330		SOFT GRAY CLAY					NORTH		
460	500	BRITTLE YELLOW	AND GRAY	CLAY MIX V	MIH		•		MODIFICATION/REPAIR
500	600	COARSE SAND BRITTLE YELLOW			<u> </u>				Other (Specify)
500	020	GRAVEL							
620	920	BRITTLE GRAY CL	AY WITH SA	AND AND GI	RAVEL				 DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG"
920		SOFT SILTY GRAY							PLANNED USES (\checkmark)
									WATER SUPPLY
	<u>.</u>					WEST		EAST	Irrigation Industrial
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					. 1				SPARGING
	1					Illustrate or Describe D	SOUTH	Buildings,	
						Fences, Rivers, etc. and necessary. PLEASE BH	attach a map. Use additiona	LETE.	OTHER (SPECIFY)
		· · · · · · · · · · · · · · · · · · ·	,		[WATER	LEVEL & YIELD	OF COMPL	ETED WELL
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						DEPTH OF STATIC	··· .		
							(Ft.) & DATE	MEASURED -	
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		COMPLETED WELL 94		ļ			esentative of a well's l		
Г						·]		ANN	ULAR MATERIAL
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Page 10 of						•	j	Refer to Insi	ruction P	°am,			S	TATE W	ELL NO	./ STATI	ON NO.
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Page 12 of 12		Refer to Instruction F		STA	TE WELL NO	D./ STAT	10N NO.
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	GEOLOGIC LOG		ľ				
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	OFT GRAY CLAY WITH SAN	O AND GRAVEL		CATION SKETCH -			CTIVITY (🗹) —
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						VAP	OR EXTRACTION
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			Illustrate or Describe.	SOUTH	uildings,	1	REMEDIATION
				attach a map. Use additional BE ACCURATE & COMPL			DTHER (SPECIFY)
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EDOM CUDEAOE DV	DRE - TYPE (<u><</u>)			DEPTH FROM SURFACE		TY	PE
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				964 977	V		BENTONITE C
				977 1200		×	NATIVE FILL
ATTACHME				TION STATEMENT			
Geologic Log Well Construct	tion Diagram	signed, certify that this report ATON DRILLING CO	is complete and accura	te to the best of my knowledg	e and belief.		
Geophysical L	.og(s) (PE	RSON, FIRM, OR CORPORA			、	~~	05805
	emical Analysis	T KENTUCKKAVE	•	WOODLANE CITY	/	CA STATE	<u>95695</u> ZIP
Other ATTACH ADDITIONAL INFOR	Signed	Marh Danu		09/	/05/06		<u> 257 A HIC - 1337</u> 83
DWR 188 REV. 11-97	IF ADDITIONAL SPACE I	ELL DRILLER/AUTHORIZED			E SIGNED		C-57 LICENSE NUMBER

OB.GINAL File with DWR. WULL COMPLETION REPORT <u>21 IN ELGA SMA-</u>3 $\Delta \phi = 0.61$ № 801406⁶ × · · 77 and a charge WELL A Owner's Well No. Electric states Ser AL and deal Glenn $= |X_{i}|_{X_{i}} = 1$. . i in a traing GEOLUGIE THE otary_ OF SCREEKSON **FLOCATION** Grey Sand admission and to a Soll lover Million \odot 2.0 aQ 12.05 Sand & Gravel 7.0 1.000 3.0 40 Glenn 1.72.535 Ηo HSClay_ MARGER DIST. ්න්ඩ 📖 🗧 Gravelly Sand Gravelly Sand Kan Sutty Clay. 45 58 Yesad pe<u>n</u> :. .<u>..</u>. 94 SS. l traite in i cherie й 4-і -98 -dayiy gand TOUATION SKEWER Z. J. J. LINESS **P**•9 122 134 genvel. 122 132 138 . Ear Clay_ Sindy growly clay 139 14% In Clay_ 何效 1.69 176 :169 <u>جامعہ ہے</u> وہ رو<u>ان</u> 176 19.2 Zan, 🛆 PEANNED. X ت 13 . 704 <u>er an S y</u> 227 232 Chay you find the and the second the 48 6 ନ୍ତ୍ର Rd25 Special Sec. ...X Sundy grand chay 304 .. 202 316 304 316 342 Gravel & sand with day. 342 344 Sand 366 Clayer Sand 428 62. Yellow Brown Clay 434 Sound Clay 442 Le Yellow Brown Clay 344 366 ···· · 42.8 HUNCH YOURSHELCOMPUTE 434 . WARREN WEATHER OF COMPLETED WITE 1442 452 Grove 452 518 Lt yellow Benna Clay 11.68.64 1. Eripte Co. plation and Indep Zamideride 32 Shallot 20102-02 presidente de la pa . . - . . - . a part of the state 520 463 · · · · HAG al an ang EASING IS WVCUR MALIRAY i ser te 1660 - Saltta di ± 2.46 • -) i $(1,1,\dots,N)$ یں اور اور اور اور اور اور اور اور اور 23 - 2-Marta Real ··· / [*. 1.¹7 1 * Com 1. 473,482 452, Sular H & Sind Stell <u>े 5 म</u> 52440 423 0.52 . 2.9 452 442 . 5.5 423 161 24 2. 153/22/32, Sulace Hy Sund Stad 161 105 132. 7-2. 2.4 5.5 185 73 002 # & Swed 73 3 75,44 54, Subin Stud . 7" .34 Sch46 34 0 54 44 $C \in \mathbb{Z}$ 5.3. VITV. CERTIFICATION NEAR MENT CAUND there there are an international state of the work of the second state of the second s Line da ectrum. Exploration) CA 95698 ZAMOTA, 471 5/2261 25/00 20 ALCONTRACTORS ALCONDATIONAL CONCERSION ASSAULTED FOR ACCOMPANY AND A 1999 (2011) FOR ACCOMPANY AND A 1999 (2011)

Department of Water Resources Jasper Deep

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Deep Well

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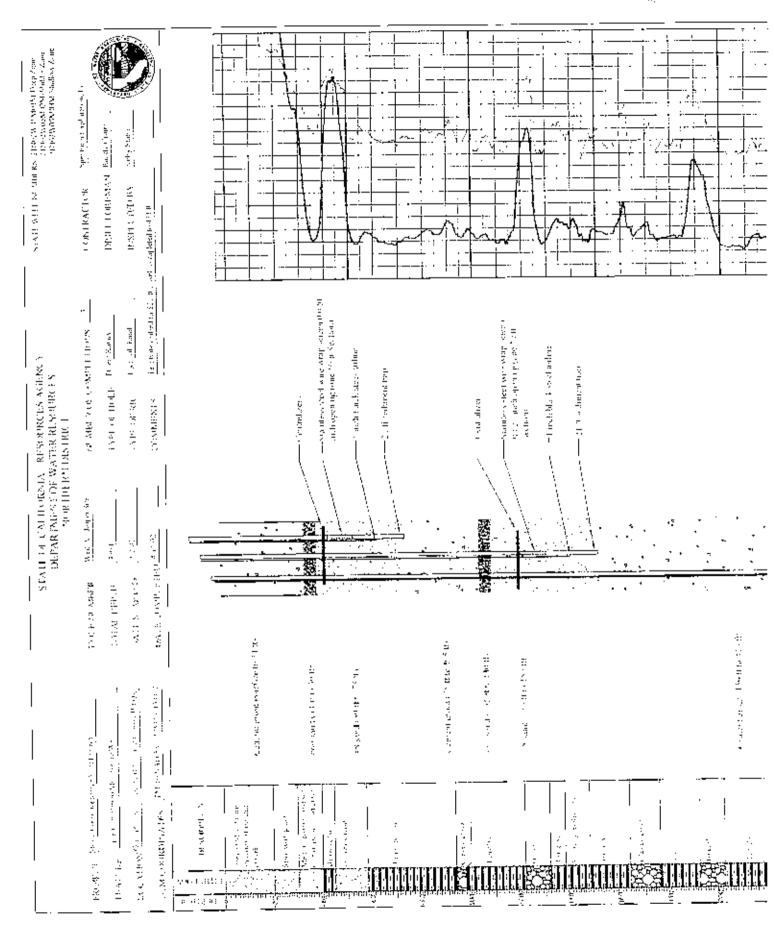
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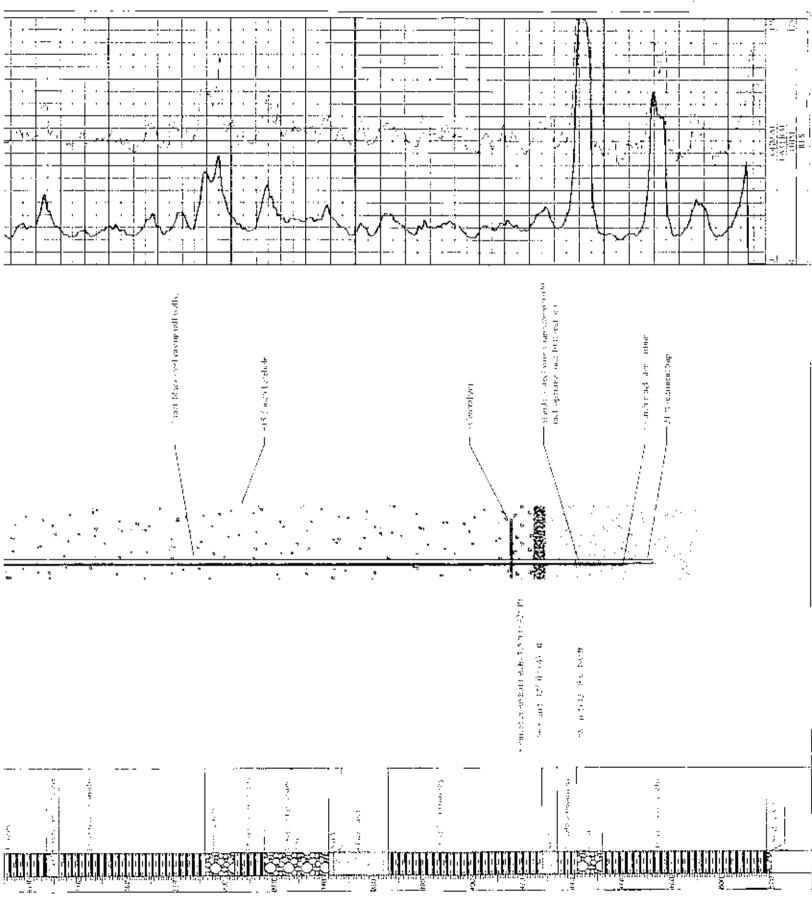
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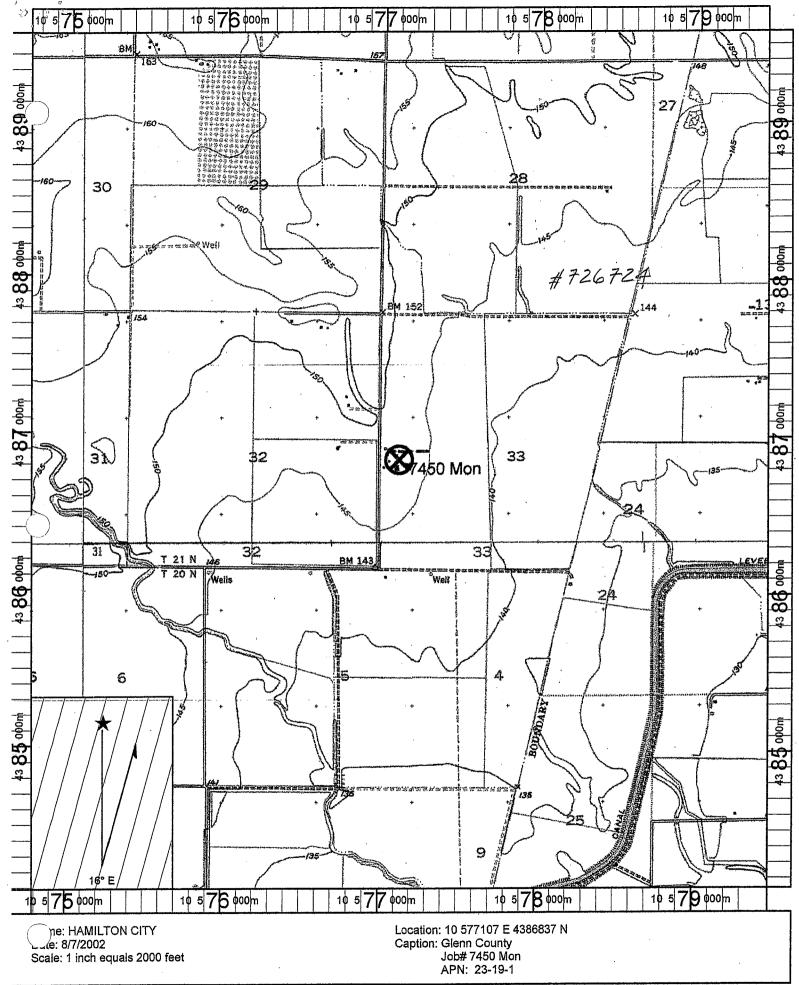
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ا	-	Geophysic	struction Di al Log(s)	agra	11				ON, FIRM, O	R CORPORA		N) (TYPED OR PRI				, , , , , , , , , , , , , , , , , , , ,		
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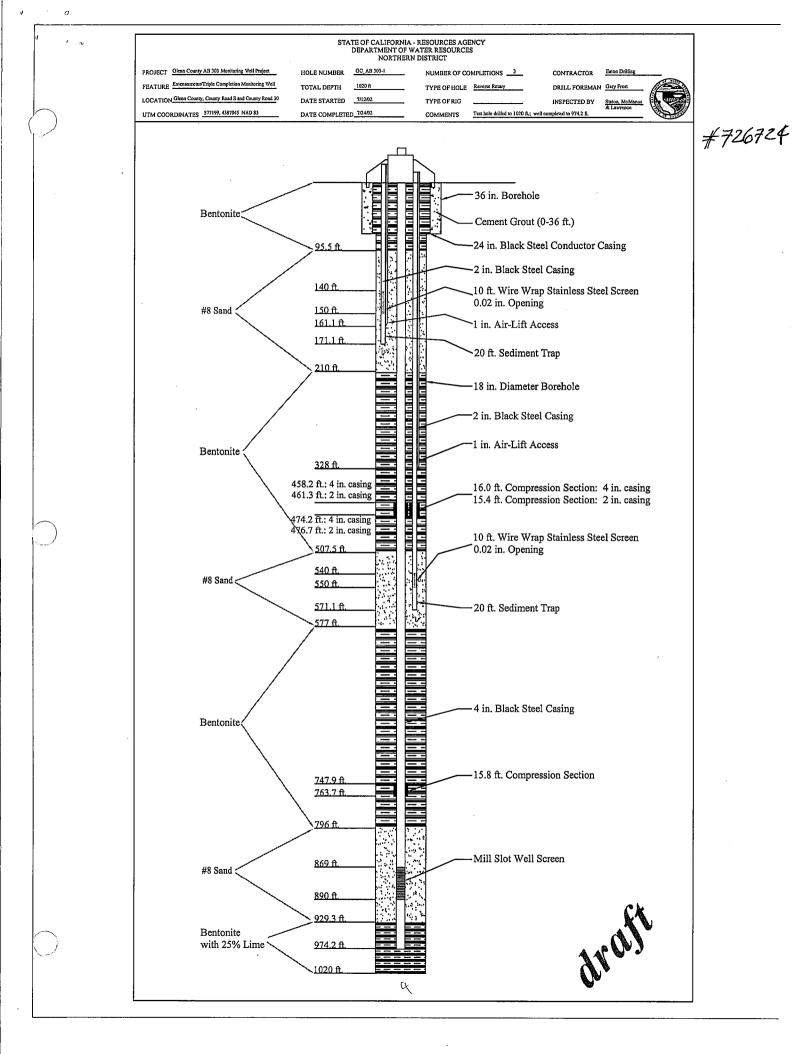
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l		ATTACT	IMENTS									- CERTIFICA					<u> </u>	<u> </u>	
I		 ATTACE Geologic 		(⊻.	, .			I, the undersi	gned, certify th	at this report	is co	 CERTIFICA omplete and accurate 					ellef.		
ا	l, —		struction D cal Log(s)	iagrai	n			NAME E	ATON DRI	LLING CC). ATIO	N) (TYPED OR PRI	INTER))		·			
) コ			Anal	ysis			20 W. KE	ENTUCKY						OODLAI	ND		CA	95695
		Other						ADDRESS Signed	Macht	ani	_		·			08/07/0	02		133783-C57A
l	ATTACH AL	DITIONAL IN	IFORMATIO	in, IF				WE				PRESENTATIVE NSECUTIVELY N			D	ATE SIG			C-57 LICENSE NUMBE



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21N/02W-36M

ORIGINAL File with DWR

STATE OF CALIFORNIA THE RESOURCES AGENCY DEPARTMENT OF WATER RESOURCES WATER WELL DRILLERS REPORT

Do not fill in

No. 315494

e of Intent No.	State Well No.
Local Permit No. or Date <u>B5768</u>	Other Well No90215-1
	(12) WELL LOG: Total depth <u>155</u> ft. Completed depth <u>145</u> ft.
	from ft. to ft. Formation (Describe by color, character, size or material)
	0 - 15 Brn sandy clay
(2) LOCATION OF WELL (See instructions): 447	15 - 25 Brn sandy clay and gravel
	25 - 34 Grey clay and sand
	34 - 40 Clay
Well address if different from above Township $2 \sim N$ Range Section Section	40 - 55 Clay sand and gravel
•	55 - 68 Gravel
Distance from cities, roads, railroads, fences, etc APN#: 23-08-041	68 - 130 Gravel and Cray
AFN#: 23-00-041	130 - 155 Gravel
	-
(3) TYPE OF WORK: See Attached New Well X Deepening	- (\ \
	- ^ //
Reconstruction	
Reconditioning	
Horizontal Well	\wedge \rightarrow (α, \forall)
Destruction (Describe destruction materials and pro-	AL AS
cedures in Item 12)	
(4) PROPOSED USE.	
Domestic	
Irrigation	
Industrial	
Test Well	
Municipal	
Other X	
(5) EQUIPMENT:	
Rotary X Reverse C No X No Size	
Cable Air Cable Air	
Other D Bucket Racked from 110 to 155 (
(7) CASING INSTALLED: (8) PERFORATIONS:	Ð
Steel Plastic Concrete Type of performion or size of series	-
From To Dia Gage or to Store tt.	
0 120 6 3/16 120 40 0.050	
140 145 6 3/16	_
(9) WELL SEAL: Was surface sanitary seal provided? Yes ↓ No □ If yes, to depth <u>110</u> ft	
	Work started 3-22 19 89 Completed 3-24 19 89
Method of sealing	
(10) WATER LEVELS: Depth of first water, if known f	
Standing level after well completionf	This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief \mathcal{I}
	1 Aller D Marin
(11) WELL TESTS: Was well test made? Yes No 🕱 If yes, by whom?	Signed
Turne of test Pump Bailer Air lift	NAME Maggiora Bros. Drilling, Inc.
to water at start of test ft. At end of test f	595 Air Bor, firm, Brrow Gation) (Typed or printed)
Discnarge gal/min after hours Water temperature	Watsonville, CA 95076
Chemical analysis made? Yes 🗌 No 🖾 If yes, by whom?	
Was electric log made Yes 🗌 No 🔯 If yes, attach copy to this report	License No. 249957 Date of this report $6-30-89$

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

Page 1 of 1					⁰⁴ well	Rejer to In	struction r	ampniei		\$	TATE V		D/STAT	TION NO.
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DWR 188 REV. 11-97

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

ORIGINAL STATE OF CALIFORNIA File with DWR WELL COMPLETION REPORT Refer to Instruction Pamphlet Page ____ of WELL №. 8014044 TPCIPCE PLET TOP. Owner's Well No. _______ Date Work Began ______ WET LONGITUDE LATITUDE 10 ___. Ended Glenn Co Ith Local Permit Agency NO APN/TRS/OTHER 3/12/0'= Permit No. -Permit Date GEOLOGIC LOG ORIENTATION (∠) HORIZONIAL ANGLE (SPECIEY) VEBTIGAL-DRILLING Kotar METHOD FLUID _ DEPTH FROM DECRIPTION SUBFACE Describe material, grain size, color, etc •••• Et Et. to Every Location Sand O 120 med CONVCE Address to. 20 30 Artois City_ Ordve 1 fine 38 20 Sand grave GL 30 6401 Codise County ____ _Parcel_0/4-9 APN Book 024 Page 050 38 139 ardvel Sand and 39 :40 Clay Township 🔿 🖄 Range Section Sand 40 60 to NORTH 9rdv Carrie Latitude. WEST Longitude. DEG. MIN DEG. MIN. SEC SEC 60 70 Sand <u><u>arave</u></u> LOCATION SKETCH ACTIVITY (∠) 80 NEW WELL 70 andve ેલા Sanc Clay - NORTH 80 140 Rrow Clay 7+ W Grave MODIFICATION/REPAIR 150 _ Deepen 14 O Same UNAVO _ Other (Specify) 160 150 Grave Sana odinse m 60 170 Clay avive TAN DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG", 170 180 Bret Zan 長 GVOVE d 190 80 Clay 6 Sana Grav PLANNED USES (∠) Clay WATER SUPPLY 220 140 Grave たるい _ Domestic _ 220 320 Winnor Clór Irrigation ____ Industria p. Rd 30 العمو بالموالك EAST 330 Clay 320 tran Brown 1 arrive MONITORING day 330 340 Gravel Brock Zan TEST WELL ٠N Clai 360 340 CATHODIC PROTECTION HEAT EXCHANGE 370 4, 360 Clay grave viner amounts F Sand DIRECT PUSH 460 Clay 370 MINON grave w amounts of INJECTION 460 1500 Clay Savy grave h. minor amounts VAPOR EXTRACTION SPARGING SOUTH REMEDIATION Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. PLEASE BE ACCURATE & COMPLETE. OTHER (SPECIFY) 3 Thic 400 completions Con structed 32 Shallow 120 = moderate WATER LEVEL & YIELD OF COMPLETED WELL 191.5 93.51 393. DEPTH TO FIRST WATER _____ (Ft.) BELOW SURFACE DEPTH OF STATIC WATER LEVEL (Ft.) & DATE MEASURED ESTIMATED YIELD * ____ ____ (GPM) & TEST TYPE 420 TOTAL DEPTH OF BORING (Feet) TEST LENGTH _ (Hrs.) TOTAL DRAWDOWN (Ft.) TOTAL DEPTH OF COMPLETED WELL 393 .5 (Feet) * May not be representative of a well's long-term yield. CASING (S) ANNULAR MATERIAL DEPTH DEPTH BORE FROM SURFACE FROM SURFACE TYPE(⊻) TYPE HOLE GAUGE OR WALL THICKNESS CON-DUCTOR FILL PIPE SLOT SIZE DIA. INTERNAL SCREEN MATERIAL / CE-BEN-BLANK DIAMETER FILTER PACK (inches) GRADE MENT TONITE FILL Com Et. to Et. (Inches) (Inches) Ft. to Ft (TYPE/SIZE) (≤) (ビ) (⊻) #8 Sand 393, 363 373, Sonace Stee if 420 339 52240 1 73 1 363 <u>3</u>39 5 1200 2 0. 020 2" 11,142,160-152,142,0 ch40 #8 Sand tee 200 127 24 70, 152, 160, 14 1 0.020 127 184 21 Sch 40 # 8 Sand 3 84 33 13,42 72, Sur Stee 24 0.020 33 142 is <u>00</u>2 ATTACHMENTS (∠) CERTIFICATION STATEMENT the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief. I. Geologic Log Exploration trum 2 _ Well Construction Diagram NAME CORPORATION) (TYPED OR PRIN (PER Geophysical Log(s) 95698 AMOTA Soil/Water Chemical Analyses ADDRESS CITY STATE Other /8 5 02 ATTACH ADDITIONAL INFORMATION, IF IT EXISTS LER/AUTHORIZED REPRESENTATIV DWR 188 REV. 11-97 IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

Department of Water Resources Van Tol Deep

801404

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Deep Well

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	Ft. to Ft.	Borehole Dia.	Туре	Material Grade	Internal Dia	Gauge	Slot Size
	393.5-373		Blank	Steel	2"	Sch 40	
-	373 – 363		Screen	Steel	2"	Sch 40	.020
	363 - +1'		Blank	Steel	2"	Sch 40	

Middle Well

	Ft. to Ft.	Borehole Dia.	Туре	Material Grade	Internal Dia	Gauge	Slot Size
	191.5 - 170		Blank	Steel	2"	Sch 40	
	170 - 160		Screen	Steel	2"	Sch 40	.020
>	160 - 152		Blank	Steel	2"	Sch 40	
/	152 - 142		Screen	Steel	2"	Sch 40	.020
	142 - +1.5'		Blank	Steel	2"	Sch 40	

Shallow Well

	Ft. to Ft.	Borehole Dia.	Type	Material Grade	Internal Dia	Gauge	Slot Size
,	93.5 - 72 72 - 42 42 - +2		Blank Screen Blank	Steel Steel Steel	2" 2" 2"	Sch 40 Sch 40 Sch 40	.020

Annular Material

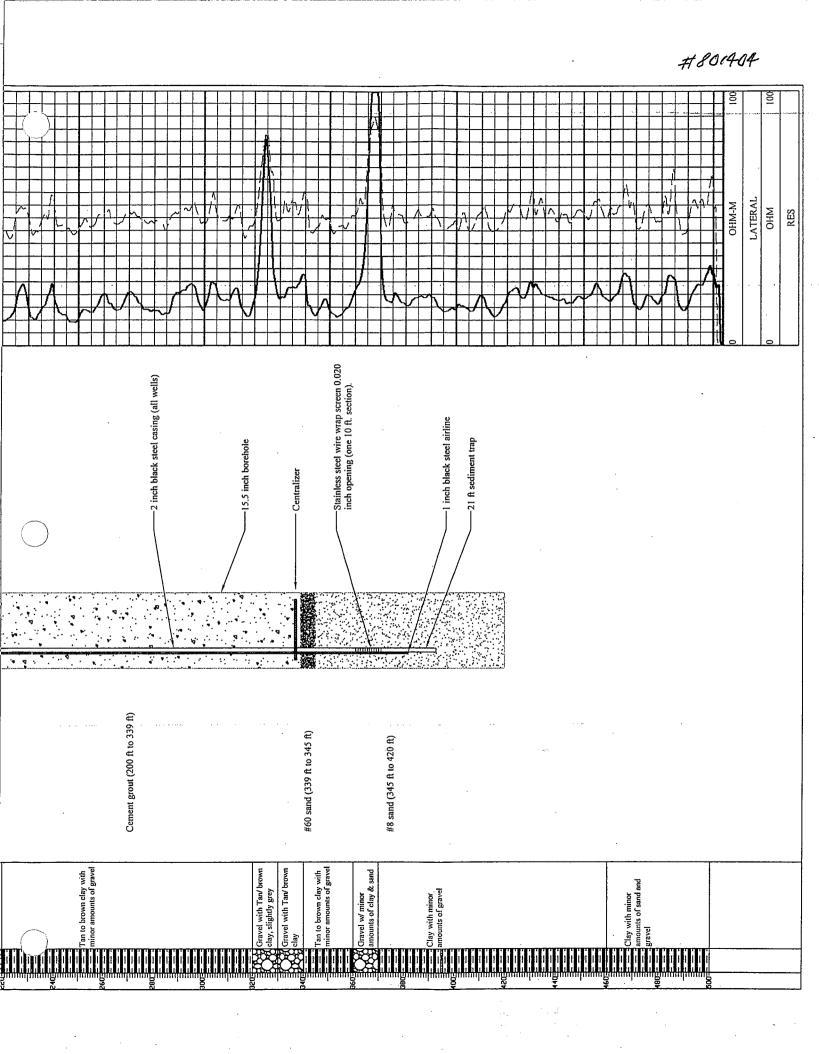
Ft. to Ft.	Type
393.5 - 353	#8 Sand
353 - 345	#60 Sand
345 - Surface	Cement Grout

STATE WELL NUMBERS: 21N03173D01M-Dec	CONTRACTOR Spectrum Exploration, Inc. DRILL FOREMAN Randy Criner INSPECTED BY Kelly Staton			
STATE OF CALIFORNIA-CRESOURCES AGENCY DEPARTMENT OF WATER RESOURCES NORTHERN DISTRICT	MBER Well A - Van Tol Site NUMBER OF COMPLETIONS 3 EPTH 420 ft TYPE OF HOLE Direct Rotary 4 ARTED 3/20/02 TYPE OF RIG Insert Rotary 1 ARTED 3/29/02 COMMENTS Test hole drilled to 500 ft. 1	Upper borehole reamed out to 16 inch diameter and 40 ft. depth Samitary grout seal to 40 ft. depth Black steel conductor casing 1 inch wall thickness to 40 ft. Stainless steel wire wrap screen 0.020 inch opening (three 10 ft. sections). Centralizer	1 inch black steel airline 21 ft sediment trap Borehole reamed to 15.5 inch diameter from 40 ft. to 420 ft. Stainless steel wire wrap screen 0.020 inch opening (two 10 ft. sections).	Centralizer — I inch black steel airline — 21 ft sediment trap
	PROJECT Stony Creek Recharge Pilot Project HOLE NUMBER FEATURE Triple Completion Monitoring Well TOTAL DEPTH LOCATION Glenn County, County Rd 27 and County Rd M DATE STARTED UTM COORDINATES UTM 10 NAD 83 570561, 4391143 DATE COMPLET	DESCRIFTION DESCRIFTION Poorly graded medium sand, sub-angular to sub-rounded Vini fine to med, sand of mean origin, sub-rounded clasts Month fine to Clay Clay<	and with gravel and sand Cement grout (84 ft to 127 ff) transform L1, brown to tan clay with gravel and sand Cement grout (84 ft to 127 ff) transform #60 sand (127 ft to 132 ff) transform fieldy fieldy fieldy for ourse sand #8 sand (127 ft to 132 ff) for ourse sand fieldy for ourse sand fieldy for ourse sand fieldy for ourse sand fieldy for ourse sand fieldy	Recrementary with Becommendary with Franknown clay with Bravel and med. sand Clavel with tan to brown clay brown clay

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801 404



ORIGINAL File with DWR				WELL	STATE O	F CALIFOR		DR		03 h		NOT FILL
Page 1 of 6	1AY 3]	200	15		Refer to Ins	truction Pa	mphlet		- Is	TATE WELL	NO./ STA	TION NO.
Owner's Well No					No.	8162	24					
Date Work Began				, Ended 3/14/20	005				LATITUDE		L	ONGITUDE
Local Permit A		ENN	cou	NTY HEALTH	DEPT				.] [₄┶┷┷┙
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		TICAL	— н	IORIZONTAL	ANGLE	(SPECIFY)						
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33 40	STREA		WIN C				APN Book 0	24	Page <u>130</u>	Parcel U	09	<u> </u>
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IF ADDITIONAL SPACE IS NEEDED,

DWR 188 REV. 11-97

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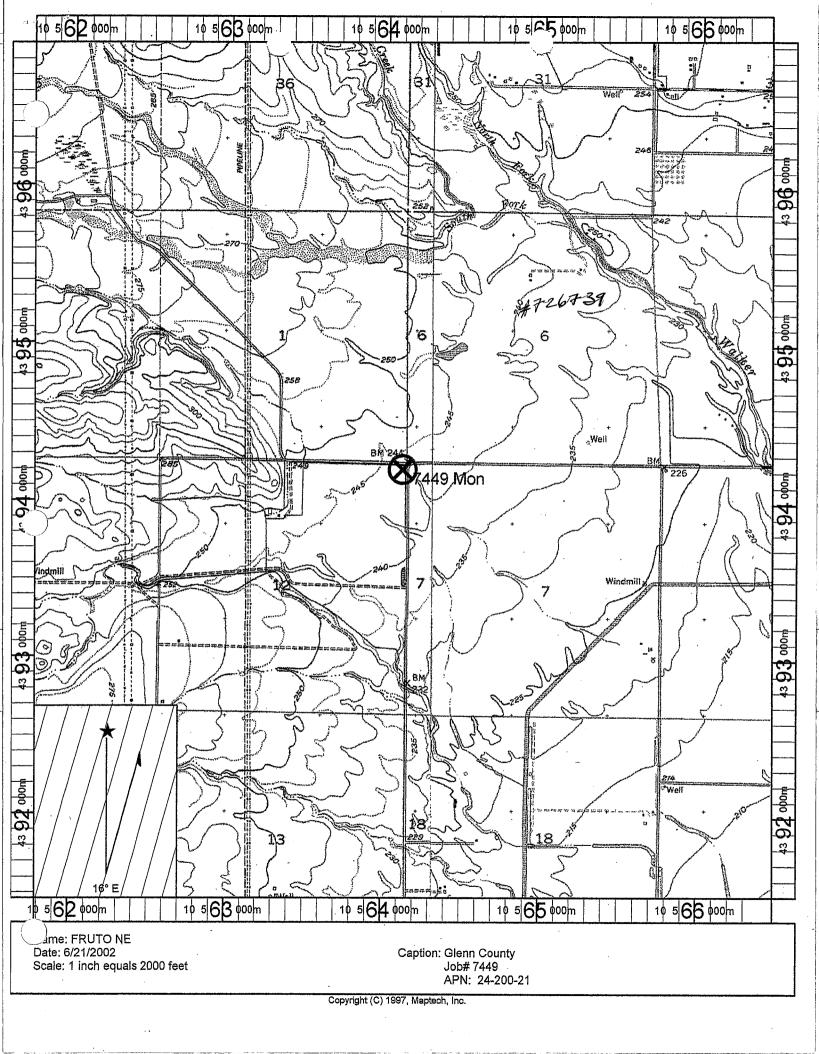
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			struction Dia cal Log(s)	agram				SON, FIRM, O	R CORFORA) (TYPED OR PR	(INTED)						
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	ATTACH ADI	DITIONAL IN	IFORMATIO	v, IF IT	EXISTS.					REP	RESENTATIVE			TE SIG			C-57 LICENSE N	

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

DWR 188 REV. 11-97

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	Page 2 of 2									nstruction .			•	S	TATE V	VELL NO	D/STAT	TION NO.
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	540		<u></u>					ARSE SAND				PN Book 024						
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											11	Illustrate or Describe L Fences, Rivers, etc. and	attach a map.	Use additiona	l paper	r, if		OTHER (SPECIFY)
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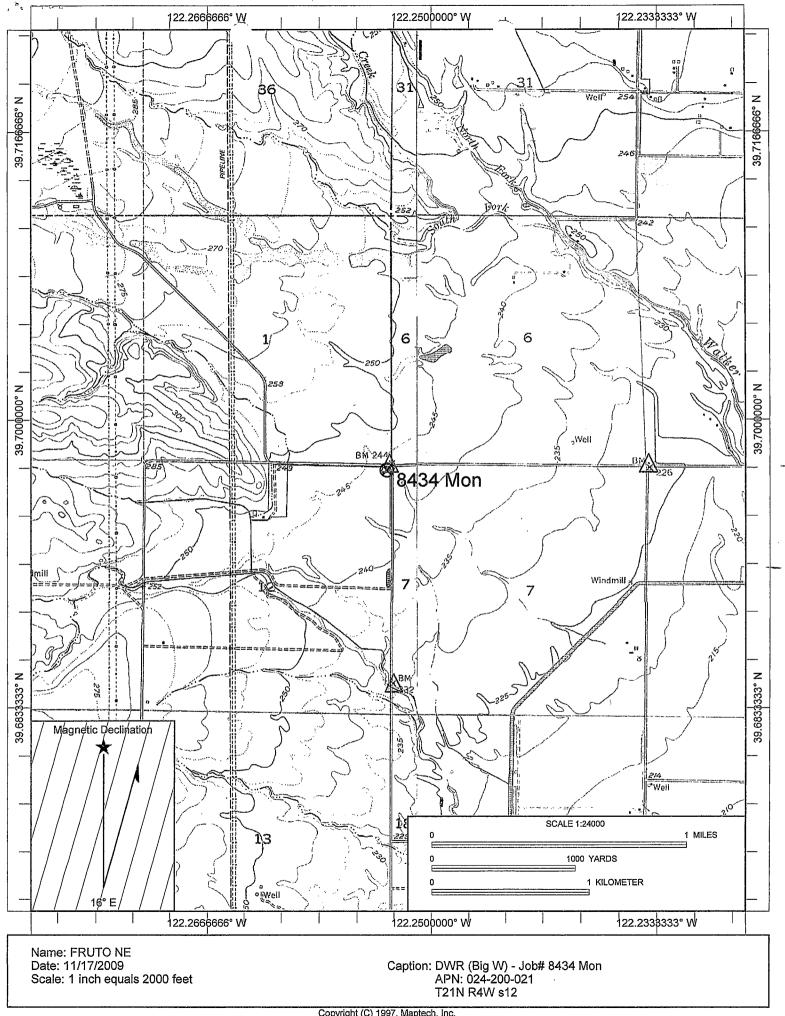


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TOTAL D	EPTH OF	COMPLE	TEC	W ('ELI	<u>, 1(</u>	070	(Feet)				May not be repr	re.	sentative of a well's l	ong-te	rm yiel	d.	
1				-									۱ſ					
DEP FROM SU	PTH	BORE -			E (⊻	\sim		C	ASING (S)	1		1		DEPTH FROM SURFACE		ANNU		MATERIAL
		HOLE DIA.		z	<u> </u>	12		MATERIAL /	INTERNAL	GAUGE	F	SLOT SIZE		FROM SURFACE	CE-	BEN-	<u> </u>	'PE
Ft. to	Ft.	(Inches)	BLANK	SCREEN	CON-	LP		GRADE	DIAMETER		LL	IF ANY		Ft. to Ft.	MENT	TONIT	E FILL	FILTER PACK (TYPE/SIZE)
			m	ŝ	Ĕ				(Inches)	THICKNE	:55	(Inches)			<u>(工)</u>	(<u>~</u>)	(<u>~</u>)	(1192/3/22)
Zone	1	40.07										ļ	l	0 265	✓	, I		Sand Slurry
0;		10-3/4	\checkmark		_			VC	2.5					<u>265 285</u>		 ✓ 	· 	Bentonite Seal
520		10-3/4		√				VC	2.5				l	285 480			✓	SRI#8 Sand
530¦		10-3/4			_			VC	2.5				l	480 496		✓	,	Bentonite Seal
590¦		10-3/4		~					2.5	SCH				496 658			✓	SRI#8 Sand
600¦	I	10-3/4					P	VC	2.5	SCH	80		۱L	658 675		✓		Bentonite Seal
		IMENTS	(⊻)) •				<u>.</u>						FION STATEMENT				
1 _	— Geologic — Well Coi	Log nstruction E)iaora	m				I, the undersig	aned, certify ti ATON DRI	nat this repor	ntis D.	complete and accura	ite	to the best of my knowled	ige and	belief.		
_	Geophysi	cal Log(s)	•					(PERS	SON, FIRM, O	OR CORPOR		ON) (TYPED OR PF	RIN				~ ~	0.500 -
-		r Chemical	Ana	lysis	5			ADDRESS	<u>KENTUC</u>					WOODLAN CITY	U.		CA STATE	95695 ZIP
	— Other		ON. //	= 17	EXI	STS	-	Signed	Mark	Dam				1	2/31/0		<u>(</u>	<u>C57 A HIC - 1337</u> 8
DWR 188 REV			, 11					-				EPRESENTATIVE	NP.		TE SIG	NED	(C-57 LICENSE NUMBER
100 AE Y				1		וטכ		INE OF AUE 10	$\square \square $			SHOLOU HVEL (P	A C					

ORIGINAL	JAN 0 8 2009		OF CALIFO				<u>DO</u>	NOT_FILL_IN
	WE WE		Struction P					
Page 2 of 3 Owner's Well No	8434	•		03388				
	11/23/2009 , Ended	_ 12/3/2009		00000		└───┴───┤ └──┘ द	<u> </u>	
	gency Glenn County Health						1	
Permit No.		Permit Date 11/	/19/2009			APN/TR	S/OTHER	λ
	GEOLOGIC LOG				_			
ORIENTATION (⊥)		AL ANGLE	_(SPECIFY)					
DEPTH FROM	DRILLING ROTARY							
SURFACE	DESCRI	PTION						
Ft. to Ft.	<i>Describe material, gr</i> Top soil	ain, size, color, el	ic.	701.00	f Road 25 & 70' W	OCATION-		
	Sand and gravel			Address <u>70 So</u> City <u>CA</u>	1 R0au 25 & 70 W	OI ROAD D		<u> </u>
	Sandy brown clay			County GLENN	1	11-10-0		
	Sand and gravel			•	Page <u>200</u>	Parcel 021		
	Sandy brown clay				Range4_W			
	Sand and gravel			Latitude	1			l
	Sandy brown clay			DEG.	MIN. SEC. CATION SKETCH		DEG.	MIN. SEC. CTIVITY (🗹)
	Sand and gravel		ł		NORTH			NEW WELL
	Sandy brown clay							FICATION/REPAIR
	Sand and gravel Sandy blue clay		<u>-</u>					Deepen Other (Specify)
	Sand with small gravel							
	Sandy blue clay with small	aravel						DESTROY (Describe Procedures and Materials
	Sandy blue clay	3						Under "GEOLOGIC LOG"
	Small gravel							NNED USES (\checkmark)
	Sandy blue clay			WEST		EAST	— I	Domestic Public Irrigation Industrial
950 1080	Black sand			3		E		
								DIC PROTECTION
i								HEAT EXCHANGE DIRECT PUSH
							VAP	OR EXTRACTION
	· · · · · · · · · · · · · · · · · · ·				SOUTH		_	SPARGING REMEDIATION
l				Illustrate or Describe	Distance of Well from Roads, d attach a map. Use addition	<i>Buildings,</i> al paper if		OTHER (SPECIFY)
				necessary. PLEASE I	d attach a map. Use addition BE ACCURATE & COMI	PLÉTE.		
				WATE	R LEVEL & YIELD	OF COMPI	ETED	WELL
				DEPTH TO FIRST	WATER- (Ft.) BE	LOW SURFAC	Έ	
	L			DEPTH OF STATIC	: (Ft.) & DATE			
					* (GPM) & `			
TOTAL DEPTH OF					(Hrs.) TOTAL DRAV			
TOTAL DEPTH OF	COMPLETED WELL <u>1070</u>	(Feet)		May not be rep	resentative of a well's l	ong-term vie	ld.	
DEDTU		CASING (S)				ANN	TILAR	MATERIAL
DEPTH FROM SURFACE	BORE - TYPE (<u>✓</u>)		[DEPTH FROM SURFACE	Aut		/PE
		RIAL / INTERNAL DIAMETER	GAUGE OR WALL	SLOT SIZE		CE- BEN-		FILTER PACK
Ft. to Ft.	DIA. NATE (Inches) BI ANK (Inches) BI ANK BI	(Inches)	THICKNES		Ft. to Ft.	MENT TONII (<u>√</u>) (<u>√</u>)	FILL	(TYPE/SIZE)
630 640	10-3/4 V PVC	2.5	SCH 8	.030	675 870		$\overline{\checkmark}$	SRI#8 Sand
640 660	10-3/4 V PVC	2.5			870 911	V		Bentonite Seal
Zone 2					977 1080		V	SRI#8 Sand
0, 955	10/8 V PVC	2.5	SCH 8					
955 975 975 1030	8-3/4 V PVC 8-3/4 V PVC	2.5 2.5	SCH 8 SCH 8				<u> </u>	
		. 2.3						
ATTACH		e undersigned, certify th	nat this report i	is complete and accura	ATION STATEMEN?			
	struction Diagram	AME EATON DRI	LLING CO.	•				
		WEST KENTUC		TION) (TYPED OR PF	WOODLAN	D	CA	95695
Other		DRESS	Day		CITY 1	2/31/09	STATE	<u>=</u> ZIP C57 A HIC - 13378
L	VPORMATION, IPTIEXISTS.			REPRESENTATIVE	DA	TE SIGNED		C-57 LICENSE NUMBER
DWR 188 REV. 11-97	IF ADDITIONAL S	PACE IS NEEDED,	USE NEXT (CONSECUTIVELY N	NUMBERED FORM			

	OF CALIFO			SE ONLY	DO	NOT FILL IN
	PLETIO				NOVET	
		03388				
Date Work Began <u>11/23/2009</u> , Ended <u>12/3/2009</u>	LOI	03300		⊑ [[[[_	
Local Permit Agency Glenn County Health Dept						
Permit No. <u>MW 319-09</u> Permit Date <u>11</u>	/19/2009	· · · · · · · · · · · · · · · · · · ·		APN/T	RS/OTHEI	R
GEOLOGIC LOG						
ORIENTATION () VERTICAL HORIZONTAL ANGLE	_(SPECIFY)					
DRILLING DEPTH FROM METHOD ROTARY FLUID MUD)					
SURFACE DESCRIPTION	to					
Ft. to Ft. Describe material, grain, size, color, et 0 5 Top soil		Address 70' Sof	Road 25 & 70' W	OCATION of Road	D	
5 65 Sand and gravel		City CA				
65 170 Sandy brown clay		County GLENN				
170 180 Sand and gravel			Page <u>200</u>	Parcel 02	21	
180 230 Sandy brown clay		Township 21 N	Range4 W	Section 1	2	
230 260 Sand and gravel		Latitude			DEG.	I I
260 275 Sandy brown clay 275 280 Sand and gravel			ATION SKETCH			ACTIVITY (🕐) —
280! 370! Sandy brown clay			NORTH		┨ᠽ	NEW WELL
370 380 Sand and gravel					MOD	IFICATION/REPAIR
380 515 Sandy blue clay						Other (Specify)
515¦ 540 Sand with small gravel						DESTROY (Describe
540; 650; Sandy blue clay with small gravel						DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG"
650 Sandy blue clay						ANNED USES(∠)
879 900 Small gravel 900 950 Sandy blue clay		31				ER SUPPLY Domestic Public
950 1080 Black sand		WEST				Irrigation Industrial
					CATHO	
						HEAT EXCHANGE
						DIRECT PUSH
					VAF	POR EXTRACTION
						SPARGING
		Illustrate or Describe Di.	SOUTH — stance of Well from Roads, ittach a map. Use addition	Buildings,		REMEDIATION OTHER (SPECIFY)
		necessary. PLEASE BE	ACCURATE & COM	PLETE.		
		WATER	LEVEL & YIELD	OF COM	PLETEI	D WELL
		DEPTH TO FIRST W	ATER (Ft.) BE	LOW SURF.	ACE	
		DEPTH OF STATIC	(Ft.) & DATI			
			(FL) & DATI			
TOTAL DEPTH OF BORING 1080 (Feet)			(Hrs.) TOTAL DRAV)
TOTAL DEPTH OF COMPLETED WELL <u>1070</u> (Feet)		May not be repre.	sentative of a well's	long-term y	ield.	
DEPTH BODE CASING (S)			DEDTU	AN	NULAR	MATERIAL
FROM SURFACE BORE TYPE (1)			DEPTH FROM SURFACE			YPE
HOLE I I I I I DIAL Image: Stress of the stress	GAUGE OR WALL			CE- BE		FILTER PACK
Ft. to Ft. (Inches)	THICKNES		Ft. to Ft.	(⊻) (⊻		(TYPE/SIZE)
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1050 1070 8-3/4 V PVC 2.5	SCH 8	30				
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ATTACHMENTS (\leq)	· ···	- CERTIFICA	FION STATEMEN	r		
Geologic Log I, the undersigned, certify the undersigned certify the NAME_EATON DRI	hat this report	is complete and accurate	to the best of my knowle	dge and belie	f.	
Geophysical Log(s) (PERSON, FIRM, C	OR CORPORA	TION) (TYPED OR PRIN			~	05005
Soil/Water Chemical Analysis Other		-	WOODLAI CITY	<u>uu</u>	<u>CA</u> STAT	95695 E ZIP
ATTACH ADDITIONAL INFORMATION IF IT EXISTS Signed	<u>UTHORIZED</u>	REPRESENTATIVE		12/31/09		C57 A HIC - 13378 C-57 LICENSE NUMBER
DWR 188 REV. 11-97 IF ADDITIONAL SPACE IS NEEDED,						

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	Page 1 of (CONT Refer to In						STATE	VELL NO	J STAT	TON NO.
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	Permi	t No M	W207-0	4					Permit	Date 5/3	/2004		``````````````````````````````````````			A	PN/TRS/	OTHER	
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	800								BLUE CLAY			┞			— south ———				SPARGING
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	ATTACH AL		NFORMATIC	ON, II	FΠ	ΤEX	(IST:	S .	Signed			DRF	PRESENTATIVE		.	06/01/			C57 A HIC - 133783 C-57 LICENSE NUMBER
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nor's Well No. 10/1 WOIN				
e Work Began <u>5/6/2004</u>	Ended5/14/2004		APN	TRS/OTHER
1 Domnit Agency GLEINIS Conten	Permit Date 5/3/2004			
Permit No. <u>MW207-04</u> GEOLOGIC				
	ORIZONTAL ANGLE (SPECIFY)			
	FLUID MUD			
	RECEIPTION	СПҮ		N CIR P
SURFACE Describe mater	rial, grain, size, color, etc.	Address 75 FT N OF	C/R 18 & 9 MIE C	DF_C/R F
A 20 SAND AND GIVIN	<u></u>	City CA		
20 60 TAN SILTY CLAY	=	County GLENN		060
60 70 SAND AND GRAV	· / · · ·	APN Book 046 F	Page 310 Parcel Range 2 W Section	n 30
70 120 TAN SILTY CLAY 120 160 SAND AND GRAV		Township 22 N I	Range ² W Section	
TAN/PROWN SIL	TY CLAY	Latitude DEG. MIN.	SEC.	DEG. MIN. SEC. ACTIVITY (1)
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		CLY		
360 380 POORLY SRTD S	AND AND GRAVEL			— DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")
360 380 POORLY SRTD C 380 400 POORLY GRD S/	SAND AND GRAVEL WICLAY			PLANNED USES (1)
400 480 POORLY SRTD 480 520 MED-CRS SAND	WITH CLAY			JAVATER SUPPLY
THE FOOD V GRD S	AND			Domestic — Public Industrial
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	AND AND GRAVEL	[TEST WELL
				CATHODIC PROTECTION HEAT EXCHANGE
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A CDS SAN) WIME ANNOW THE			INJECTION
760 BI UE CLAY W	SAND AND GIVAVE			VAPOR EXTRACTION SPARGING
760 780 TAN/BROWN C		24	SOUTH	REMEDIATION
	ID W/BI LIE CLAY	Illustrate or Describe Di	istance of Well from Roads, Build	dings, per if OTHER (SPECIFY)
		Fences, Rivers, etc. and	ACCURATE & COMPLE	E.
820 900 MED-CRS BLA	AND ASH W/SOME FINE SA	ND WATER	LEVEL & YIELD OF	COMPLETED WEEL
		DEPTH TO FIRST W	ATER	W SURFACE
		DEPTH OF STATIC	(Ft.) & DATE Mi	
The second second	the state of the s	WATER LEVEL	(GPM) & TES	ST TYPE
	· · · · · · · · · · · · · · · · · · ·	ESTIMATED YIELD	(UTAL DRAWDO	DWN (Ft.)
TOTAL DEPTH OF BORING 920	(Feet)	May not be repr	resentative of a well's lon	g-term yield.
TOTAL DEPTH OF BOMINE TOTAL DEPTH OF COMPLETED WE	LL <u>900</u> (Feet)	May no. et a		ANNULAR MATERIAL
	CASING (S)		DEPTH FROM SURFACE	TYPE
DEPTH BORE - TYPE		GAUGE SLOT SIZE		CE- BEN- MENT TONITE FILL (TYPE/SIZE)
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000 000		at this report is complete and acc LING CO.	CATION STATEMEN	edge and belief.
ATTACHMENTS (⊥) Geologic Log	I, the undersigned, certify th NAMEEATON_DRII	LING CO. ICORPORATION) (TYPED OR	PRINTED)	
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DWR 188 REV. 11-97

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- ATTACHMENTS (∠) -____ Geologic Log Malt Con h-----

- CERTIFICATION STATEMENT -I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.