



BUTTE COUNTY

DEPARTMENT OF WATER AND RESOURCE CONSERVATION

**DRAFT INITIAL STUDY/
PROPOSED MITIGATED NEGATIVE DECLARATION**

**LOWER TUSCAN AQUIFER MONITORING,
RECHARGE AND DATA MANAGEMENT PROJECT**

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ABBREVIATIONS AND ACRONYMS

Agencies, Boards, Commissions, Districts:

BCAQMD	Butte County Air Quality Management District
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CNPS	California Native Plant Society
(CV)RWQCB	(Central Valley) Regional Water Quality Control Board
DOT	(US) Department of Transportation
DFG	(California) Department of Fish and Game
DTSC	(California) Department of Toxic Substances Control
DW&RC	Department of Water and Resource Conservation
EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
TCAPCD	Tehama County Air Pollution Control District
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service

Approvals, Agreements, Permits:

CASWP	Construction Activity Storm Water Permit
ITP	Incidental Take Permit
NWP	Nationwide Permit
SAA	Streambed Alteration Agreement
SWPPP	Storm Water Pollution Prevention Plan

Guidelines, Policies, Programs, Regulations:

BMP(s)	Best Management Practice(s)
BPM	Best Practices Manual
CBC	California Building Code
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CWA	Clean Water Act
ESA	Endangered Species Act
GP	General Plan
IWRP	Integrated Water Resources Plan
IRWMP	Integrated Regional Water Management Plan
MEA	Master Environmental Assessment
NHPA	National Historic Preservation Act
NPDES	National Pollution Discharge Elimination System
PRC	Public Resources Code
SWMP	Storm Water Management Program
UBC	Uniform Building Code

Miscellaneous:

CNDDDB	California Natural Diversity Database
dB	Decibel(s)
FIRM	Flood Insurance Rate Map
LOS	Level(s) of Service
MS4	Municipal Separate Storm Sewer System
PM10 / 2.5	Particulate Matter less than 10 / 2.5 Microns
§	Section

1.0 PROJECT INFORMATION

1.0 PROJECT INFORMATION

This Project Information, Environmental Checklist and the descriptive information contained herein constitute the contents of an Initial Study in accordance with Section 15063 of the California Environmental Quality Act (CEQA) Guidelines:

1. **Project Title:**
Lower Tuscan Aquifer Monitoring, Recharge and Data Management Project
2. **Lead Agency/Project Sponsor:**
Butte County Department of Water and Resource Conservation
3. **Department Representative:**
Paul Gosselin, Director, Department of Water and Resource Conservation
4. **Staff Contacts:**
Chris Thomas, Senior Planner, Department of Development Services – (530) 538-6706
5. **Type of Project:**
Information Collection - A scientific field research and data gathering and analysis project to evaluate aquifer recharge and recovery.

6. Project Summary:

The Sacramento Valley Groundwater Basin and the Redding Groundwater Basin represent the principal groundwater basins of the broader Sacramento River Hydrologic Region. The Sacramento Valley Groundwater Basin is bound by the Coast Ranges to the west, the Cascade Range to the northeast, and the Sierra Nevada to the east, extending from the City of Red Bluff in the north to the Delta in the south. As described by California Department of Water Resources (DWR), the Sacramento Valley groundwater basin underlies approximately 4,900 square miles of the Sacramento Valley.

The Tuscan Aquifer system, a regional aquifer of the Sacramento Valley Groundwater Basin, is among the principal water bearing units in Butte County. The Tuscan Formation consists of four units, labeled A through D, with A and B defining the Lower Tuscan and C and D defining the Upper Tuscan (Helley and Harwood, 1985). The majority of the groundwater is found in the Lower Tuscan (CDM, 2005a).

The buried extent of the Lower Tuscan system spans from the Redding Basin in the north to the Sutter Buttes in the south and from the eastern margin of the valley westward ± 30 miles. This represents approximately 850 square miles of the northern Sacramento Valley. In the subsurface, the Lower Tuscan has an estimated average thickness of about 500 feet.

The Lower Tuscan Aquifer is a critical resource to the region. An increasing number of municipal, industrial, and agricultural wells rely on water from the Lower Tuscan Aquifer. As reliance on groundwater increases, the need to protect the aquifer as a groundwater resource is a regional priority. However, regional planning efforts are hampered due to incomplete data pertaining to aquifer system functions in terms of source, recharge and recovery.

1.0 PROJECT INFORMATION

Butte County has been awarded grant funds from DWR through Proposition 50 (Water Security, Clean Drinking Water, Coastal and Beach Protection Act of 2002) for implementation of the proposed Lower Tuscan Aquifer Monitoring, Recharge and Data Management Project (project). Specifically, the proposed project is a scientific study to acquire a better understanding of the parameters of the Lower Tuscan Aquifer, including its source and recharge characteristics. The project does not involve assessing specific water projects but rather improves upon the data that are appropriate for protecting the groundwater resource of the Lower Tuscan.

The proposed project constitutes a discrete research project. The study is intended to provide scientific data that will provide a greater understanding of the Lower Tuscan Aquifer; it is not a part of a larger project or sequence of projects involving the export of groundwater or the substitution of groundwater for surface waters that may be exported outside the northern Sacramento Valley. Projects involving the export of surface water and groundwater from either Butte or Tehama County are not being considered for approval by the County. Pursuant to Butte County Code Section 33-5 and 33-6, the export of groundwater or substitution of groundwater for surface water exports in Butte County would require a permit and full CEQA review. Tehama County Code (Chapter 9.4) provides for a similar permitting process when an export of groundwater is proposed.

The proposed project is comprised of seven tasks, which are the subject of this CEQA analysis, that are designed to provide a greater understanding of the following:

- The physical parameters that influence the ability of surface water to percolate to the aquifer system
- When, where and how much water from streams interact with groundwater in the Lower Tuscan Aquifer
- The current recharge contribution of other aquifer systems to the Lower Tuscan Aquifer, and how this contribution may change when gradients change from increased utilization of the resource
- Typical aquifer properties and variability of the properties over the region
- Ability to predict the natural recharge areas and source waters under current hydrologic conditions
- The ability to predict natural recharge areas and source waters with increased utilization of the aquifer system
- How pumping activities may impact the aquifer

In addition, the project would result in the development of a comprehensive GIS Geodatabase of the Lower Tuscan Aquifer with improved spatial distribution of the monitoring network and a public outreach program that will heighten public awareness and understanding of the aquifer.

This is a three-year monitoring and data gathering and analysis project that is managed by the Butte County Department of Water and Resource Conservation (DW&RC) in cooperation with the Four County Group, per the Four County Memoranda of Understanding (MOUs) between Butte, Colusa, Glenn, Tehama, and subsequently, Sutter Counties. Shasta County is in the process of joining the Four County MOU group, now called the Northern Sacramento Valley Integrated Regional Water Management Planning Group.

2.0 REGULATORY CONTEXT

2.0 REGULATORY CONTEXT

2.1 CALIFORNIA ENVIRONMENTAL QUALITY ACT

Section 21084 of the Public Resources Code requires the CEQA Guidelines to include a list of classes of projects which have been determined not to have a significant effect on the environment and which shall, therefore, be exempt from the provisions of CEQA. Among the classes of projects declared to be categorically exempt from the requirement for the preparation of environmental documents are Class 6 Information Collection projects.

Per CEQA Guidelines §15306, a Class 6 Information Collection project consists of “basic data collection, research, experimental management, and resource evaluation activities which do not result in a serious or major disturbance to an environmental resource.” These projects may be strictly for information gathering purposes, or as part of a study leading to an action, which a public agency has not yet approved, adopted, or funded.

The Lower Tuscan Aquifer Monitoring, Recharge and Data Management Project is an information collection project involving scientific studies that will provide a better understanding of: 1) the movement of groundwater within the Lower Tuscan Aquifer system, 2) the hydrogeologic properties of the aquifer, 3) areas of aquifer recharge, and 4) changes in groundwater gradients in association with groundwater use.

The Lower Tuscan Aquifer Monitoring, Recharge and Data Management Project would be considered Categorically Exempt from the provisions of CEQA, per §15306 Class 6 exemption. However, the Guidelines (§15300.2) provide the following exceptions to Categorical Exemptions:

Location. Classes 3, 4, 5, 6, and 11 are qualified by consideration of where the project is to be located -- a project that is ordinarily insignificant in its impact on the environment may in a particularly sensitive environment be significant. Therefore, these classes are considered to apply all instances, except where the project may impact on an environmental resource of hazardous or critical concern where designated, precisely mapped, and officially adopted pursuant to law by federal, state, or local agencies.

Historical Resources. A categorical exemption shall not be used for a project which may cause a substantial adverse change in the significance of a historical resource.

This Initial Study sets forth mitigation measures for air quality, biological resources, and cultural resources per CEQA standards for the adoption of negative declarations. Thus, Butte County DW&RC has prepared this Initial Study to consider environmental resources, to ensure the installation of monitoring and data collection equipment avoids potentially sensitive resources, and to identify and address all applicable federal, state and local permitting requirements.

Per CEQA Guidelines §15063, the purposes of an Initial Study are to:

- Provide the Lead Agency with information to use as the basis for deciding whether to prepare an EIR or a Negative Declaration
- Enable an applicant or Lead Agency to modify a project, mitigating adverse impacts before an EIR is prepared, thereby enabling the project to qualify for a Negative Declaration

2.0 REGULATORY CONTEXT

- Assist in the preparation of an EIR, if required
- Facilitate environmental assessment early in the design of a project
- Provide documentation of the factual basis for the finding in a Negative Declaration that a project will not have a significant effect on the environment
- Eliminate unnecessary EIRs
- Determine whether a previously prepared EIR could be used with the project

This Initial Study, with supporting environmental discussion and analysis, provides the justification for the Proposed Mitigated Negative Declaration (MND) pursuant to CEQA Guidelines §15070 (et seq.) for the Lower Tuscan Aquifer Monitoring, Recharge, and Data Management Project. Per CEQA Guidelines §15070, a public agency shall prepare or have prepared a proposed negative declaration or mitigated negative declaration for a project subject to CEQA when:

(a) The initial study shows that there is no substantial evidence, in light of the whole record before the agency, that the project may have a significant effect on the environment, or

(b) The initial study identifies potentially significant effects, but:

(1) Revisions in the project plans or proposals made by, or agreed to by the applicant before a proposed mitigated negative declaration and initial study are released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effects would occur, and

(2) There is no substantial evidence, in light of the whole record before the agency, that the project as revised may have a significant effect on the environment.

The Initial Study, prepared by Butte County DW&RC, acting as the CEQA Lead Agency, has determined that the proposed Lower Tuscan Aquifer Monitoring, Recharge, and Data Management Project would not have a significant effect on the environment pursuant to CEQA. Because the Lead Agency finds no substantial evidence that the project or any of its aspects may cause a significant impact on the environment with mitigation, a Proposed Mitigated Negative Declaration (MND) has been prepared. Written statements describing the reasons why the proposed project would not have a significant effect on the environment have been included in the Initial Study Checklist, and therefore, justifies why the project does not require the preparation of an EIR (CEQA Guidelines §15063 and §15070).

The Initial Study/Proposed Mitigated Negative Declaration has been prepared in accordance with the California Environmental Quality Act (PRC §21000, et seq.) and the CEQA Guidelines (Title 14 CCR, §15000 et seq.).

2.0 REGULATORY CONTEXT

2.2 PARTICIPATING AGENCIES

2.2.1 LEAD AGENCY

Butte County DW&RC is the Lead Agency for the proposed Lower Tuscan Aquifer Monitoring, Recharge, and Data Management Project. The Lead Agency is the public agency with primary responsibility over a proposed project. Where two or more public agencies will be involved with a project, CEQA Guidelines Section 15051 provides criteria for identifying the Lead Agency. In accordance with CEQA Guidelines Section 15051(a), “If the project will be carried out by a public agency, that agency shall be the Lead Agency even if the project would be located within the jurisdiction of another public agency.” In addition, Section 15051(d) states, “Where the provisions of subdivisions (a), (b), and (c) leave two or more public agencies with a substantial claim to the Lead Agency, the public agencies may by agreement designate an agency as the Lead Agency.”

2.2.2 RESPONSIBLE AGENCIES

“Responsible Agency” means a public agency which proposes to carry out or approve a project, for which a Lead Agency is preparing or has prepared a Negative Declaration or EIR (CEQA Guidelines Section 15381). The decision-making body of each Responsible Agency shall consider the Lead Agency’s environmental document, in this case a Mitigated Negative Declaration, prior to acting upon or approving the project. Each Responsible Agency shall certify that its decision-making body reviewed and considered the information contained in the Negative Declaration on the project (Guidelines §15050). Relative to the proposed study, participating agencies include:

- Department of Water Resources
- Regional Water Quality Control Board
- Tehama County

2.3 INTENDED USES OF THE INITIAL STUDY

Butte County DW&RC has prepared this Initial Study in consideration of environmental resources, to ensure the installation of monitoring and data collection equipment avoids potentially sensitive resources, and to identify and address all applicable federal, state and local permitting requirements. This Initial Study sets forth mitigation measures for air quality, biological resources, and cultural resources per CEQA standards for the adoption of negative declarations.

The proposed project constitutes a discrete research project. The study is intended to provide scientific data that will provide a greater understanding of the Lower Tuscan Aquifer; it is not a part of a larger project or sequence of projects involving the export of groundwater or the substitution of groundwater for surface waters that may be exported outside the northern Sacramento Valley. Projects involving the export of surface water and groundwater from either Butte or Tehama County are not being considered for approval by the County. Pursuant to Butte County Code Section 33-5 and 33-6, the export of groundwater or substitution of groundwater for surface water exports in Butte County would require a permit and full CEQA review. Tehama County Code (Chapter 9.4) provides for a similar permitting process when an export of groundwater is proposed.

2.4 APPROVALS

Other approvals, including informal consultation and permits, that may be required for the installation of scientific measuring devices/equipment for monitoring and data collection, include:

2.0 REGULATORY CONTEXT

- Informal Consultation resulting in letters of concurrence from NMFS and USFWS: Informal Consultation may be necessary with National Marine Fisheries Service (NMFS-NOAA Fisheries) and US Fish and Wildlife Service (USFWS) for actions that have no adverse effects on listed species. Department of Fish and Game consistency determination for species listed under both the federal Endangered Species Act (ESA) and California ESA.
- US Army Corps of Engineers (USACE/Corps): Clean Water Act Section 404, Nationwide Permit 5-Scientific Measuring Devices; non-notifying permit for scientific measuring device actions.
- California Department of Fish and Game (DFG): Fish and Game Code Section 1602 notification to determine if activities are subject to a Streambed Alteration Agreement (SAA).
- Department of Water Resources (DWR): maintenance or upgrades to stream gauge stations that may be used as part of this project.
- State Water Resources Control Board/Regional Water Quality Control Board (RWQCB): consultation to determine if Clean Water Act Section 401, Water Quality Certification is necessary; some actions have been pre-certified.
- Central Valley Flood Protection Board – CVFPB: permits required for portions of streams that may be designated floodways.
- County of Butte: Monitoring Well Permit, per Butte County Code, Chapter 23B.
- Temporary access easements/agreements at project sites.

3.0 PROJECT DESCRIPTION

3.0 PROJECT DESCRIPTION

3.1 OVERVIEW OF THE PROPOSED PROJECT

3.1.1 PROJECT BACKGROUND

The Sacramento Valley groundwater basin lies between the Coast Ranges to the west, the Cascade and Sierra Nevada Ranges to the east and extends from the City of Red Bluff in the north to the Delta in the south, covering 4,900 square miles. As defined by the State Department of Water Resources, the Sacramento River groundwater basin underlies the Sacramento Valley. Among the principal water bearing units in the Sacramento Valley portion of Butte County is the Tuscan Formation, which consists of four units, Units A through D. Units A and B contain the majority of the groundwater in the Tuscan Formation (CDM, 2005a), and is referred to as the Lower Tuscan Aquifer. The Lower Tuscan Aquifer system is a critical regional water resource. The Butte County Board of Supervisors has declared in Chapter 33A of the County Code:

The Board finds that the protection of the groundwater resource for beneficial use within the County is of major concern to the residents of the county for the protection of their health, welfare and safety. The Board further declares that the beneficial use and maintenance of groundwater and protection of recharge zones is of critical importance to the economy and environment of the County.

Butte County has been awarded grant funds from the Department of Water Resources (DWR) through Proposition 50, Water Security, Clean Drinking Water, Coastal and Beach Protection Act of 2002 for implementation of the Lower Tuscan Aquifer Monitoring, Recharge and Data Management Project (project). Specifically, the project is a scientific study to acquire a better understanding of the parameters of the Lower Tuscan Aquifer, including its source and recharge characteristics.

The project is comprised of seven tasks, which are the subject of this CEQA analysis. The project is consistent with the Butte County Groundwater Management Plan (CDM, 2005a), Butte County Integrated Water Resources Plan (CDM, 2005b), and other Butte County water resource planning efforts and various state-initiated regional water plans. In addition, the project also includes a public outreach and education component.

This is a three year monitoring and data gathering and analysis project that is being managed by the Butte County DW&RC in cooperation with the Four County Group, per the Four County Memorandum of Understanding (MOUs), which include Butte, Colusa, Glenn, Tehama, and subsequently, Sutter Counties. Shasta County is in the process of joining the Four County MOU group, now called the Northern Sacramento Valley Integrated Regional Water Management Planning Group.

3.2 PROJECT LOCATION

3.2.1 LOWER TUSCAN FORMATION AND AQUIFER

The Tuscan Formation is geologically divided into four units, Units A, B, C, and D (Helley and Harwood, 1985), and as an aquifer system into two primary units, the Upper and Lower Tuscan. Tuscan Formation Units C and D define the Upper Tuscan, and Units A and B define the Lower Tuscan. The Lower Tuscan Aquifer system is the focus of the proposed scientific study. **Figure 1** shows the estimated extent of the buried portion of the Lower Tuscan Aquifer in the northern Sacramento Valley.

3.0 PROJECT DESCRIPTION

The buried extent of the Lower Tuscan Aquifer system in the northern Sacramento Valley extends from the Redding Basin in the north to the Sutter Buttes in the south and from the eastern margin of the valley, westward 10 to 30 miles. In the subsurface, the Lower Tuscan Formation covers an area of about 850 square miles and has an estimated average thickness of about 500 feet. The Lower Tuscan Aquifer system is also exposed at the ground surface along the east side of the valley. In the central portion of the valley, it is found at depths ranging from 500 to 1000 feet below the ground surface.

3.2.2 PROJECT STUDY ACTIVITIES

The proposed Lower Tuscan Aquifer Monitoring, Recharge and Data Management Project would include data collection and monitoring activities in areas of Butte and Tehama Counties that are underlain by the Lower Tuscan Aquifer System. These activities would extend from southern Tehama County to south-central Butte County. **Figure 1** identifies the general vicinity of the project area, showing the outermost boundaries of where project activities will occur. Data collection and monitoring activities will occur in two areas.

1. Along the eastern edge of the Sacramento Valley, where the Tuscan Formation is exposed at the ground surface, specifically along six perennial streams that cross the exposed areas of the Tuscan Formation: Antelope Creek, Mill Creek, Deer Creek, Big Chico Creek, Butte Creek, and Little Dry Creek (north to south, respectively).
2. Within the valley area of western Butte County, east of the Sacramento River where groundwater, used for drinking water and irrigation, is drawn from the aquifer.

3.0 PROJECT DESCRIPTION

Figure 1: Lower Tuscan Aquifer and Project Study Sites

3.0 PROJECT DESCRIPTION

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3.0 PROJECT DESCRIPTION

3.3 PROJECT PURPOSE AND OBJECTIVES

The proposed Lower Tuscan Aquifer Monitoring, Recharge and Data Management Project is a study that seeks to improve the scientific understanding of the parameters of the aquifer. Pursuant to California Water Code, the counties of the Four County MOU are authorized “management agencies” (§107531) with adopted Groundwater Management Plans (§10750). The information gathered as a result of this study would provide these management agencies a better understanding of the aquifer so that management policies and programs can be developed within an increasingly well-informed framework of scientific knowledge.

The need for a more accurate characterization of the Lower Tuscan Aquifer and its recharge capacity is driven by future demand on groundwater resources and potential changes in land use that could affect those resources. Enhancing surface and groundwater monitoring stations will provide an improved ability to assess either the localized and overall effects of different rates of groundwater withdrawal or recharge. The Project’s specific purpose is to better quantify and qualify the Lower Tuscan’s characteristics in order to protect the groundwater resource of the aquifer.

The proposed project constitutes a discrete research project. The study is intended to provide scientific data that will provide a greater understanding of the Lower Tuscan Aquifer; it is not a part of a larger project or sequence of projects involving the export of groundwater or the substitution of groundwater for surface waters that may be exported outside the northern Sacramento Valley. Projects involving the export of surface water and groundwater from either Butte or Tehama County are not being considered for approval by the County. Pursuant to Butte County Code Section 33-5 and 33-6, the export of groundwater or substitution of groundwater for surface water exports in Butte County would require a permit and full CEQA review. Tehama County Code (Chapter 9.4) provides for a similar permitting process when an export of groundwater is proposed.

Ultimately, the objectives and outcome of the monitoring and recharge component of the proposed project include a greater understanding of the following:

- The physical parameters influencing the ability of surface water to percolate to the aquifer system
- How water from streams interacts with groundwater in the Lower Tuscan Aquifer
- Recharge contributions of other aquifer systems to the Lower Tuscan Aquifer
- Typical aquifer properties and variability of the properties over the region
- Natural recharge areas and source waters under current hydrologic conditions
- Natural recharge areas and source waters with increased utilization of the aquifer system
- How pumping activities may impact the aquifer

In addition, the project would develop a comprehensive Geographic Information System (GIS) Geodatabase on the Lower Tuscan Aquifer with the improved spatial data of the monitoring network. Finally, the project includes a public outreach program that will heighten public awareness and understanding of the aquifer.

3.4 SCIENTIFIC STUDY

It is hypothesized that under current hydrologic conditions, the Lower Tuscan Aquifer system recharges along the eastern margin of the northern Sacramento Valley, where the Lower Tuscan Formation is exposed (crops-out) at the ground surface (CDM, 2007), particularly where perennial streams bisect the formation. Regional studies to identify stream losses and general soil infiltration rates have been limited.

3.0 PROJECT DESCRIPTION

While the Tuscan Formation has been the subject of previous investigations, many of the earlier studies underestimate the subsurface extent of the formation. Furthermore, these studies have not concentrated on the formation's hydrologic characteristics as a regional aquifer system. Existing studies, which have helped researchers develop the current understanding of the aquifer system and its hydrology, include the widely cited Harwood and Helly (USGS Miscellaneous Field Studies Map MF-1790, 1985). The spatial extent of the Lower Tuscan Aquifer is currently represented in analytical groundwater flow models. The area west of the Sacramento River is modeled in the Stony Creek Fan Integrated Groundwater and Surface Water Model (IGSM) Model Development Calibration and Analysis (WRIME, 2003). The area east of the Sacramento River is modeled in the Butte Basin Model, which was prepared by Camp, Dresser & McKee (CDM, 2008). Together, these models contribute to an understanding of groundwater movement within the Lower Tuscan Aquifer. Thus, significant regional information on the hydrogeologic properties, including hydraulic conductivity, leakance factor, and aquifer storage terms, is lacking.

This scientific study assesses recharge along the Lower Tuscan Aquifer outcrops and fluctuations between aquifer gradients based on other hydrogeologic influences, i.e. groundwater withdrawal for irrigation. The project activities discussed below describe the selected methods/tasks that will provide the data to assess aquifer source, recharge, and recovery parameters and will provide a greater science-based understanding of the aquifer system.

3.5 PROJECT METHODS/TASKS

The Lower Tuscan Aquifer Monitoring, Recharge, and Data Management Project is comprised of eight primary tasks, as detailed in the Request for Proposal (RFP) for the scope of work for this scientific study. These tasks include:

1. Technical Steering Committee (RFP Task 1),
2. Development of a Geodatabase (RFP Task 2),
3. Soil Infiltration Testing/Infiltrometer Testing (RFP Task 3.1)
4. Stream Gauging (RFP Task 3.2)
5. Stream Aquifer Temperature Gradient Measurements (RFP Task 3.3)
6. Installation of Additional Groundwater Monitoring Infrastructure (RFP Task 4),
7. Aquifer Performance Testing (RFP Task 5),
8. Public Outreach, Education and Coordination (RFP Task 6).

Project components 1, 2, and 8 are organizational and administrative, while Tasks 3 through 7 are field-work oriented, involving scientific data collection and the installation of monitoring and assessment equipment in order to evaluate aquifer performance. As the installation of equipment could result in a physical change to the environment, albeit negligible, the primary focus of this Initial Study is to determine if implementation of the project, as listed in tasks 3 through 7, would result in potentially significant impacts under CEQA. Thus, Butte County DW&RC has prepared this Initial Study to consider environmental resources, to ensure the installation of monitoring and data collection equipment avoids potentially sensitive resources, and to identify and address all applicable federal, state and local permitting requirements.

The organizational and administrative components (Tasks 1, 2, and 8) of the project are summarized as follows:

3.0 PROJECT DESCRIPTION

SELECTION OF TECHNICAL STEERING COMMITTEE

Although project activities would primarily occur within Butte County, ultimately the results of this scientific study will provide a greater understanding of the entire Lower Tuscan Aquifer beyond the County's borders. The project involves the collection and interpretation of basic hydrologic data. The Technical Steering Committee will provide comments to Butte County DW&RC on the project to assure that the project considers scientific perspectives and presents data in a clear and complete manner so that the information obtained is of value for future studies related to the protection of the Lower Tuscan Aquifer groundwater resources. The Technical Steering Committee includes regional experts from government, academia, public agencies, agricultural and environmental interests.

GIS DATA BASE DEVELOPMENT OF LOWER TUSCAN FORMATION AQUIFER SYSTEM

A GIS database of information for the project will include data regarding transmissivity and permeability; aquifer storage values, surface and groundwater, temperature, stream infiltration capacities, monitoring well locations, and performance well locations. The purpose of the database is to provide a resource management tool for the storage of data collected for the project and assist in future refinement of the Butte Basin Groundwater Model.

LOWER TUSCAN FORMATION AQUIFER SYSTEM OUTREACH, EDUCATION AND COORDINATION

The purpose of this task is to conduct public outreach so that there is a better understanding of the activities related to the study, the information obtained, and a more complete understanding of the aquifer.

3.6 PROJECT MONITORING AND DATA COLLECTION ACTIVITIES

3.6.1 SOIL INFILTRATION TESTING

Soil infiltration testing is a measure of the rate at which soil is able to absorb water. Soil infiltration testing allows an assessment of the passive and active water infiltration capacity of the Lower Tuscan Aquifer. Passive infiltration capacity refers to the potential for water to infiltrate the exposed Lower Tuscan Aquifer soils across the study area; active infiltration capacity refers to potential for water to infiltrate areas near active streams that could serve as groundwater recharge areas (that is, areas where surface water would be spread and allowed to percolate down into the aquifer). Using double-ring infiltrometers, soil infiltration testing would be performed at up to 10 locations at Lower Tuscan Aquifer outcrop areas.

Figure 2: Dual Ring Infiltrometer (Photo)

Double ring or dual ring infiltrometer requires two rings: an inner and outer ring. An inner ring is driven into the ground, and a second bigger ring around that to help control the flow of water through the first ring.

Water is supplied either with a constant or falling head condition, and the operator records how much water infiltrates from the inner ring into the soil over a given time period.



3.0 PROJECT DESCRIPTION

SOIL INFILTRATION SITES LOCATIONS AND SETTING

Soil infiltration sites are located along the eastern edge of the valley floor and extend into the foothills. Elevations where soil infiltration sites would be located range from 300 to 1700 feet. Access to these areas is provided by existing roadways.

A total of 12 soil infiltration site areas have been identified for this project (10 sites to be installed, 2 alternative sites). For the purposes of this Initial Study analysis, depending on site specific conditions and environmental constraints, soil infiltration sites would be located within ¼ mile of the areas identified as “SI” on **Figure 1**. Aerial photos of individual soil infiltration site areas are depicted in Appendix A.

SITING CRITERIA AND SITE PREPARATION

Access to sites will be by vehicles where a road is present or by foot if no road is present. Site preparation activities include the use of hand tools to clear an 8x8 foot area to dig a test pit up to 3-feet deep to install the dual-ring infiltrometer, **Figure 2**. If access allows, a backhoe may be used to dig the 3-foot test pit for infiltrometer installation. Preparing sites for installation of the infiltrometers will involve the following:

- Clear an 8x8 foot area for site assessment (soil tests)
- Excavate a 3-foot deep test pit for infiltrometer installation
- Install one 24-inch diameter double-ring infiltrometer at each site
- Conduct soil profile from 2-inch diameter hand-augured borehole, up to five feet deep

Twelve soil infiltration sites have been identified and described in Table 1 (10 sites to be installed, 2 alternative sites). The specific 8x8 foot area test location within site will be determined by a qualified soil scientist accompanied by a qualified biologist and archaeologist to ensure that potential biological and cultural/archaeological resources are avoided, including, but not limited to: Waters of the United States; Waters of the State; wetlands and vernal pool features; riparian habitat or other sensitive communities; threatened and endangered species; candidate, sensitive or special status species; historical, archaeological or paleontological resource or site; and disturbance of human remains. In addition, the qualified biologist will assist in choosing the 8x8 test location so that sampling will not result in the dredge or fill, either direct and permanent or indirect and temporary, of Waters of the United States, nor result in the discharge of dredged or fill material in navigable waters. In following these siting criteria, a Clean Water Act Section 404 Nationwide Permit, Section 401 Water Quality Certification, and an application under California Fish and Game Code Section 1602 for a Streambed Alteration Agreement would not be necessary. In the event that these siting criteria cannot be met, then the appropriate mitigation measures as identified in Section 4.0, Initial Study Checklist, shall be applied to avoid potential environmental impacts. Due to the minimal area required for an infiltrometer, a Stormwater Pollution Prevention Plan would not be necessary.

SOIL INFILTRATION TASK DETAILS AND MONITORING

Once each of the infiltrometers are installed, the following tasks will be conducted:

- Conduct soil profile adjacent to infiltrometer
- Conduct infiltrometer test, up to 12 hours
- Perform elevation and coordinate surveys for each site

Each test location will include basic geologic outcrop mapping in the immediate vicinity of the test location. One double-ring infiltrometer test will be performed at each of the ten proposed sites following

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ASTM Standard D-3385-03. Each test will be conducted for up to a maximum of 12 hours. Each location will include clearing of up to approximately an 8x8 foot area of vegetation in the immediate vicinity of infiltrometer placement and excavation of 3-foot test pits at each site for infiltrometer installation.

A complete soil profile and soil log will be generated from a hand augured 2-inch diameter borehole immediately adjacent to the infiltrometer test location. The borehole will extend to approximately 5-feet below ground surface (bgs) and the cuttings will be placed back in the hole. The soils will be characterized by a professional soil scientist and logged in a soil profile log. One representative soil sample will be collected for mechanical sieve analysis for grain size distribution. Each test location will be located with a global positioning system (GPS) to sub-meter accuracy for incorporation into the Geodatabase.

3.6.2 STREAM REACH ACTIVITIES - STREAM GAUGE SITES

The proposed project includes activities within and adjacent to six streams located in both Butte and Tehama Counties, which include: Antelope Creek, Mill Creek, Deer Creek, Big Chico Creek, Butte Creek, and Little Dry Creek. These streams were chosen since they may have an influence on the recharge of the Lower Tuscan Aquifer. Some of these streams have active monitoring stations. The project will enhance the stream monitoring stations along the six streams consistent with accepted data standards.

For the purposes of this Initial Study environmental analysis, within each creek a “stream reach” was defined to identify the location where project activities would occur. Within each stream reach the following equipment would be installed and data collection would occur: stream gauge installation or retrofit, stream aquifer interaction site testing, which include temperature gradient analysis (piezometer well installation), seepage meter testing, and slug tests.

Stream reaches and their corresponding buffer zones vary in length and width based upon site specific characteristics, such as geology, slope, vegetation, and access. An additional ¼ mile zone surrounding each stream reach has been evaluated for potential environmental resources and factors. Each of these stream reaches incorporates the open water within the stream channel, a corridor of riparian vegetation as well as associated upland habitat characterized as annual grassland and oak woodland.

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Table 1: Soil Infiltration Sites Setting Summary

Site	General Location	Surrounding Land Uses	Vegetation	Soil Characteristics
SI-DR-1	Butte County; located south of the SR 149 and SR 70 intersection, west of SR 70, in the vicinity of Campbell Creek. Approximate elevation 360 ft.	Agricultural land uses, including grazing land. General Plan designations include GOL-Grazing and Open Land. Zoning is U-Unclassified.	Annual grasslands, not prime farmland	Haplic Palexeralfs Loam, 0 to 5% slopes
SI-DR-2	Butte County; located southwest of SR 149, in the vicinity of the Shippee and Dove Ridge Roads; north of Gold Run Creek. Approximate elevation 180 ft.	Agricultural land uses, including grazing land. Surrounding General Plan designations include AR-Agricultural Residential, GOL-Grazing and Open Land, OFC-Orchard and Field Crops. Zoning is A-160, Agricultural.	Annual grasslands, not prime farmland	Redtough-Redswale-Anita, Gravelly Duripan, Complex, 0 to 5% slopes; Lucksev-Butteside-Carhart Complex, 2 to 15% slopes
SI-DR-3	Butte County; located off SR 191, north of Durham-Pentz Road; ±3.5 miles northeast of Butte Community College, in the vicinity of Clear Creek and the West Branch of Clear Creek. ±830-ft Elevation	Open space land uses. General Plan designations include AR-Agricultural Residential. Zoning is FR-Foothill Recreational. The area along SR 191 is designated as a <i>local</i> SH-Scenic Highway.	Annual grassland, oak woodland, not prime farmland	Xerorthents, Shallow-Typic Haploxeralfs-Rock Outcrop, Cliffs Complex, 15 to 30% slopes
SI-DR-4	Butte County; located east of SR 99, near the SR 99/Durham-Pentz Road interchange. ±180-ft Elevation	Open space and grazing land. General Plan designations include GOL-Grazing and Open Land and I-Industrial. Zoning is M1-Industrial and U-Unclassified.	Annual grasslands, not prime farmland	Tuscan-Fallager-Anita, Gravelly Duripan, Complex, 0 to 3% slopes
SI-DR-5	Butte County; located near SR 32, east of Big Chico Creek; approx. 8 miles northeast of the City of Chico. ±1,700-ft Elevation.	Open space and grazing land. General Plan designations include GOL-Grazing and Open Land. Zoning is U-Unclassified. The area along SR 32 is designated as <i>local</i> SH-Scenic Highway.	Oak woodland, not prime farmland	Ultic Haploxeralfs, Mesic - Rockstripe Complex, 15 to 30% slopes; Rockstripe-Ultic Haploxeralfs-Rock Outcrop, Cliffs Complex, 70 to 100% slopes;
SI-DR-6	Butte County, within the Chico city limits and Upper Bidwell Park; located adjacent to Big Chico Creek, in the project's Big Chico Creek stream reach. ±300-ft Elevation.	Park and recreational land uses. General Plan designation is Park. Zoning is OS-1-Open Space. Adjacent lands on the ridgeline to the south are zoned residential.	Oak woodland, riparian (adjacent to Big Chico Creek), not prime farmland	Charger Fine Sandy Loam, 0 to 1% slopes; Xerorthents, Shallow-Typic Haploxeralfs-Rock Outcrop, Cliffs Complex, 15 to 30% slopes; Xerofluvents, 0 to 4% slopes frequently flooded

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Site	General Location	Surrounding Land Uses	Vegetation	Soil Characteristics
SI-DR-7	Butte County; Keefer Road in the vicinity of Missile Rose Road, approx. 3 miles east of Highway 99. Approximate elevation 300 feet.	Agricultural residential and grazing and open land. General Plan designations include AR-Agricultural Residential and GOL-Grazing and Open Land. Zoning includes SR-3-Suburban Residential and A-160-Agricultural.	Annual grassland, not prime farmland	Redtough-Redswale Complex, 0 to 2% slopes
SI-DR-8	Butte County; located near Cohasset Road; approx. 6 miles northeast of the Chico Municipal Airport. Approximate elevation 1,400 feet.	Grazing and open land. The General Plan designation is GOL-Grazing and Open Land. Zoning is U-Unclassified.	Oak Woodland, not prime farmland	Ultic Haploxeralfs, Mesic - Rockstripe Complex, 15 to 30% slopes; Ultic Haploxeralfs, Mesic - Rockstripe Complex, 15 to 30% slopes
SI-DR-9	Tehama County; located adjacent to Pine Creek, approximately 3.25 miles east of SR 99. Approximate elevation 300 feet.	Tehama County General Plan designation is G-Grazing. Zoning is UA-AP, Upland Agricultural-Agricultural Preserve Combining District. Adjacent lands are under Williamson Act contract.	Annual Grassland, riparian (adjacent to Pine Creek), not prime farmland	Keefers loam, moderately deep, 0 to 3% slopes
SI-DR-10	Tehama County; located adjacent to Pine Creek, approximately 5.5 miles east of SR 99. Approximate elevation 500 feet.	Tehama County General Plan designation is G-Grazing. Zoning is UA-AP, Upland Agricultural-Agricultural Preserve Combining District. Adjacent lands are under Williamson Act contract.	Annual Grassland, riparian (adjacent to Pine Creek), not prime farmland	Tuscan cobbly loam, 1 to 5% slopes
SI-DR-11	Tehama County; located adjacent to Mill Creek, approximately 6.5 miles east of Los Molinos. Approximate elevation 550 feet.	Tehama County General Plan designation is G-Grazing. Zoning is UA-AP, Upland Agricultural-Agricultural Preserve Combining District and UA-B, Upland Agricultural-Special Building Site. Adjacent lands, outside of the immediate stream corridor are under Williamson Act contract.	Annual Grassland, Oak Woodland, and riparian adjacent to Mill Creek	Toomes extremely rocky loam, 1 to 50% slopes
SI-DR-12	Tehama County; located adjacent to Deer Creek, approximately 8 miles southeast of Los Molinos. Approximate elevation 550 feet. Approximate elevation 500 feet.	Tehama County General Plan designation is G-Grazing. Zoning is UA-AP, Upland Agricultural-Agricultural Preserve Combining District. Adjacent lands are under Williamson Act contract.	Annual Grassland, Oak Woodland, and riparian adjacent to Deer Creek	Toomes extremely rocky loam, 1 to 50% slopes

Notes: Site Naming Conventions: the first two characters identify the type of data and project purpose, Soil Infiltration = SI; the second two characters identify the testing method Dual Ring = DR; the third character set identifies each location sequentially, 1, 2, 3 etc..

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STREAM GAUGES & MONITORING

A staff gauge is a long ruler placed semi-permanently in a stream or lake to read water depth. Temporary stream gauging, using a typical staff gauge, within perennial streams will be used to determine the volume and rate of surface water that flows within the selected reaches of each of the six streams. The resulting data will provide for the quantitative assessment of the water exchange relationship between the Lower Tuscan Aquifer system and overlying streams at selected sites.

STREAM GAUGING SITES LOCATIONS AND SETTING

The proposed project includes gathering data on area streams. Six streams have been identified as part of the project including: Antelope Creek, Mill Creek, Deer Creek, Big Chico Creek, Butte Creek, and Little Dry Creek, refer to **Figure 1**. For the purposes of this Initial Study, “stream reaches” have been designated on each of the streams where various project activities would occur. It is within these stream reaches that potential impacts associated with implementation of project activities have been evaluated. **Table 2** summarizes the location of the Stream Gauge Sites (identified as “SG” on Figure 1) and the surrounding environmental setting and characteristics. Aerial photos of individual stream reaches are included in Appendix B.

**Table 2: Stream Reach Activities
Location of Stream Gauge Sites and Stream-Aquifer Interaction Sites**

Stream Reaches	General Location	Land Use and Zoning
Antelope Creek SG-ANC-1U SG-ANC-1D	Tehama County; ± 6 miles east of Red Bluff and ±3 miles east of SR99. The stream reach extends ±1,660 feet from gauge to gauge; the CEQA reach extends ±2,100 feet.	Land Use: Grazing; Zoning: Upland Ag, Ag Preserve
Mill Creek SG-MIC-1U SG-MIC-1D	Tehama County; ±6 miles east of Los Molinos and SR99. The stream reach extends ±4,700 feet from gauge to gauge; the CEQA reach extends ±5,500 feet.	Land Use: Grazing; Zoning: Upland Ag, Ag Preserve
Deer Creek SG-DEC-1U SG-DEC-1D	Tehama County; ±6.75 miles east of Vina and SR99. The stream reach extends ±4,300 feet from gauge to gauge; the CEQA reach extends ±9,500 feet.	Land Use: Grazing; Zoning: Upland Ag, Ag Preserve
Big Chico Creek SG-BCC-1U SG-BCC-1D	Butte County, City of Chico; ±2 miles east of SR99. The stream reach extends ±10,700 feet from gauge to gauge, the CEQA reach extends ±9,700 feet (divided into two sections).	Land Use: Park; Zoning: Open Space, Residential along ridgeline
Butte Creek SG-BUC-1U SG-BUC-1D	Butte County; ±3.8 miles east of SR99, south east of Chico. The stream reach extends ±4,415 feet from gauge to gauge; the CEQA reach extends ±5,200 feet.	Land Use: Grazing/Open Land ; Zoning: Foothill Recreational, 5 and 160-acre min.
Little Dry Creek* SG-LDC-1U SG-LDC-1D	Butte County; ±2.75 miles northeast of the SR99 / SR149 intersection. The stream reach extends ±7,500 from gauge to gauge; the CEQA reach extends ±8,100 feet.	Land Use: Grazing/Open Land; Ag Residential Zoning: Unclassified; Ag 5-acre min.
<p><i>Notes:</i> Site Naming Conventions: the first two characters identify the type of data and project purpose, Stream Gauge = SG; the second two characters identify the creeks the gauge is associated with LDC = Little Dry Creek; the third two characters identifies each gauge sequentially, 1, 2, 3 (if applicable) with an U = Upstream and D = Downstream designator.</p> <p>*Two potential locations for stream gauges have been identified on Little Dry Creek.</p>		

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Project activities that would occur within each stream reach is stream gauge monitoring and stream-aquifer interaction analyses, including temperature gradient analysis (piezometer well installation) and seepage meter testing (see Section 3.6.3 below). Two stream gauges will be located in the six stream reaches, using either existing stream gauge facilities or installing staff gauges, as discussed above.

STREAM GAUGE SITING CRITERIA AND SITE PREPARATION

As stated previously, the project proposes to use existing stream gauges on each of the six streams, when practicable. However, for the purposes of this study and environmental analysis, it is assumed that two stream gauges will be established on each of the project streams within the Lower Tuscan Formation outcrop areas for a total 12 temporary stream gauging stations. Gauging stations will be established at both the upstream and downstream ends of the stream reach to observe any potential gaining or losing conditions to the aquifer within these reaches.

In the event that new staff gauges will need to be installed, hand tools will be used. The installation of staff gauges would take approximately 2 to 6 hours to complete. In the case of the more remote creeks, Antelope, Mill, and Deer Creeks, materials for the installation will be driven to the nearest access road and walked in to these locations. The siting of any new stream gauge will be conducted by a qualified hydrogeologist, accompanied by a qualified biologist and archaeologist to ensure that potential biological and cultural/archaeological resources are avoided, including, but not limited to: the life cycle movements of aquatic species, spawning areas, migratory bird breeding areas, riparian habitat or other sensitive communities; threatened and endangered species; candidate, sensitive or special status species; historical, archaeological or paleontological resource or site; and disturbance of human remains. In following these siting criteria, the project would comply with the General Conditions of the Clean Water Act Section 404 Nationwide Permit. In the event that these siting criteria cannot be met, then the appropriate mitigation measures as identified in Section 4.0, Initial Study Checklist, shall be applied to avoid potential environmental impacts.



Figure 3: Stream Gauge (Photo)

Stream gauges will consist of a surveyed post with staff gauge. The 2-inch diameter galvanized steel post will be hand driven into the stream bed or attached to existing structures such as bridges in a location that will contain flows within the channel throughout the periods that the stream is flowing.

Each gauge will also consist of a temporary stilling well, within the mounting post, in which a pressure transducer and temperature data logger will be placed for continual monitoring of stream stage.

All stream reach fieldwork will be conducted when disturbances to the stream channel can be minimized. No stream gauges would be installed and no existing gauging stations would be retrofitted when fish are spawning, during incubation, or before juveniles have emerged. The project would comply with Clean Water Act Section 404 Nationwide Permit 5 (Scientific Measuring Devices) and Section 401 Water Quality Certification for the installation or retrofit of stream gauges. An application under California Fish and Game Code Section 1600 for a Streambed Alteration Agreement (SAA) may be necessary. The

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California Department of Fish and Game (DFG) determines if a Lake or Streambed Alteration Agreement is necessary for a particular project upon submittal of an application. The DW&RC would comply with all measures detailed in the SAA, if applicable.

STREAM GAUGING TASK DETAILS AND MONITORING

The Lower Tuscan Aquifer units A and B will be mapped in the vicinity of where each of the six streams intersects the outcrops. Two stream gauges will be established on each of the listed streams within these outcrop areas. The stream gauges will consist of a surveyed post with staff gauge, **Figure 3**. The 2-inch diameter galvanized steel post will be hand driven into the stream bed or attached to existing structures such as bridges in a location that will contain flows within the channel throughout the periods that the stream is flowing. Each gauge will also consist of a temporary stilling well, within the mounting post, in which a pressure transducer and temperature data logger will be placed for continual monitoring of stream stage.

Once staff gauges are installed or existing stream gauging stations identified and, if necessary, retrofitted, the following tasks and monitoring activities would be conducted: 1) Stream cross-sectional profile survey and 2) Bi-weekly monitoring (April through November).

A stream cross-sectional profile survey will be conducted by a California-licensed surveyor to determine the cross-sectional area and develop a stage to discharge relationship for each gauging station. Each profile location will include the installation of a 12-inch long rebar marker (located outside of the streambed) to established fixed locations for subsequent cross-sectional profile surveys, if necessary.

Monitoring will occur every other week from June to November beginning in 2010 following the completion of the installation of the gauges and necessary surveys. Monitoring will occur April to November in subsequent years. It is anticipated that monitoring will consist of approximately 20- to 40-minute visits during which the staff gauge will be read visually and the transducer downloaded to the field computer.

In addition, a stream temperature gradient evaluation will be performed at one gauging station in each of the six stream gauging stations to establish a vertical profile of water temperature fluctuations within the upper 50 feet of the shallow subsurface (refer to Stream-Aquifer Interaction Sites discussion below).

3.6.3 STREAM REACH ACTIVITIES - STREAM-AQUIFER INTERACTION SITES

To analyze the interaction of surface waters with the Lower Tuscan Aquifer, temporary piezometer wells (piezometers) will be installed outside of the stream channel within the identified stream reaches.

The stream-aquifer interaction sites are the areas where measurement of the stream-aquifer temperature gradient will be inventoried. This measurement is used to determine how groundwater is influenced by the influx of surface waters to the aquifer or, conversely, the movement of groundwater towards the surface. The temperature gradient adjacent to the streams provides information regarding the vertical direction of water movement and the amount of water a stream is losing or gaining from an aquifer. The relationship of heat as a tracer is intended to provide insight to the stream-aquifer interactions throughout the water year. Data will be used to create aquifer depth-temperature tables for a report analyzing the interaction of surface waters in the stream bed with the movement of water into and out of the aquifer system to assess overall recharge. Ultimately, comparison between the surface water temperature and the

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groundwater temperature (at varying depths) will allow calculation of the stream-aquifer temperature gradient.

Temperature monitoring will also take place as part of the stream gauging and monitoring wells data collection.

STREAM-AQUIFER INTERACTION SITES LOCATIONS AND SETTING

Approximately 24 stream-aquifer interaction sites will be located outside of the stream channel within each of the project's six stream reaches (refer to **Table 3**, above). These streams include Antelope Creek, Mill Creek, Deer Creek, Big Chico Creek, Butte Creek, and Little Dry Creek. Each stream reach will contain four stream-aquifer interaction sites or piezometer wells.

STREAM-AQUIFER INTERACTION SITES SITING CRITERIA AND SITE PREPARATION

Piezometer wells will be installed by either a hand-auger and roto-hammer or small auger on a limited access mobile drill rig to depths of up to 50 feet, **Figure 4**. If a small auger drill rig is required to advance these borings the drilling will be limited only to those locations where access of a truck mounted drill rig is possible, most likely along the three southern creeks in the study, Little Dry Creek, Butte Creek, and Big Chico Creek. Preparing sites for installation of the piezometer wells may involve the following:

Figure 4: Limited Access Mobile Drill Rig (Photo)



- Clear an area of ± 225 square feet
- Drill a borehole up to 50 feet deep piezometer installation
- Install one piezometer well at each designated site (4 sites within each of the 6 stream reaches)
- Perform elevation and coordinate surveys for each site

This task also includes the performance of slug testing and seepage meter tests:

- Slug tests will be performed on a minimum of two piezometer wells within each stream reach.
- Locations for seepage meter tests will be selected where the streambed is thin and more likely in closer connection with the Lower Tuscan Formation.

The siting of each of the piezometer sites (stream-aquifer interaction areas) within the stream reaches will be conducted by a qualified hydrogeologist accompanied by a qualified biologist and archaeologist to ensure that potential biological and cultural/archaeological resources are avoided, including, but not limited to: Waters of the United States; Waters of the State; wetlands and vernal pool features; riparian habitat or other sensitive communities; threatened and endangered species; candidate, sensitive or special status species; historical, archaeological or paleontological resource or site; and disturbance of human remains. In addition, the qualified biologist will assist in finalizing sites that would not result in the dredge or fill, either direct and permanent or indirect and temporary, of Waters of the United States, nor result in the discharge of dredged or fill material in navigable waters. In following these siting criteria, a Clean Water Act Section 404 Nationwide

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Permit, Section 401 Water Quality Certification, and an application under California Fish and Game Code Section 1602 for a Streambed Alteration Agreement would not be necessary. In the event that these siting criteria cannot be met, then the appropriate mitigation measures as identified in Section 4.0, Initial Study Checklist, shall be applied to avoid potential environmental impacts. Due to the minimal area required for a piezometer well, a Stormwater Pollution Prevention Plan will not be necessary.

STREAM-AQUIFER INTERACTION SITES TASK DETAILS AND MONITORING

The Stream-Aquifer Interaction Sites are the areas in which piezometer wells would be installed to evaluate the stream-aquifer temperature gradient. Activities associated with installation and monitoring of piezometer wells includes the following:

- Installation of piezometer wells
- Elevation and coordinate surveys will be conducted by a licensed surveyor
- Temperature gradient profiles will be collected on a monthly basis
- Conduct slug tests on piezometer wells to provide an estimate of the hydraulic conductivity
- Conduct three seepage meter tests in the vicinity of each piezometer well for a total of 18 seepage rate tests
- Temporary piezometer wells will be removed when the study is completed

Piezometers will be installed by either a hand-auger and roto-hammer or hollow-stem auger on a limited access mobile drill rig to depths of up to 50 feet.

Preliminary piezometer well design would include screened intervals from the total depth to within 5 feet of land surface. A filter pack will be placed around the 2-inch diameter polyvinyl chloride (PVC) casing within the annulus of a 4- to 6-inch borehole and sealed with bentonite slurry to the surface. The piezometer wells would be completed with an irrigation-type vault box for protection. Each well will be surveyed by a licensed surveyor to establish vertical control of the top of the casings.

In support of the recharge assessment, one borehole, described above, will be used in a down-hole permeability test at three discrete depths prior to well construction. Upon reaching each depth the borehole will be filled with water and the rate of infiltration observed. These data will support the analysis of the recharge flux rates in and near the streams.

Temperature gradient profiles will be collected on a monthly basis using a Seistronix TL-300 temperature logging device. Monitoring of the temperature profiles will continue on a monthly schedule for two years following installation of the temporary wells. Monitoring equipment can be walked to each site and will not require direct vehicle access to the piezometer well.

At the conclusion of the monitoring period, temporary piezometer wells will be sealed pursuant to state and Butte County Department of Environmental Health requirements. The temporary casings will be pulled out and remaining boreholes filled with hydrated bentonite.

Slug testing will also be performed to provide an estimate of the hydraulic conductivity ranges associated with the stream channel. The slug tests will be performed using a small solid slug and pressure transducer to record the responses. The tests will be performed on a minimum of two piezometer wells within each of the six stream reaches in accordance with ASTM D 5912 for a total of 12 slug tests. These tests take approximately 1-hour to complete and require no additional instrumentation to be installed. The data will

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be used to provide guidance when developing modeled flux rates for the temperature gradient profile analysis.

Three seepage meter tests will be performed within each stream reach for a total of 18 seepage rate tests. The seepage meter is used for making a direct measurement of the flux of water across the sediment-water interface (USGS, Rosenberry). Seepage meters would consist of a small bucket (1-foot in diameter) and/or a drum (2-feet in diameter) that is submerged in the surface-water body and pressed up to 4-inches into the stream bed. The flow rate into or out of the bucket or drum from the underlying streambed is observed over approximately a 1-hour period. The bucket or drum is removed following completion of the test. Seepage meter tests will be conducted one time, when disturbance to the stream channel can be minimized. No seepage meter tests would be conducted when fish are spawning, during incubation, or before juveniles have emerged. The flux rates measured will be used to assist in the calibration of the modeled flux rates for the temperature gradient profile analysis.

3.6.4 GROUNDWATER MONITORING WELL INSTALLATION

Over the past few years dedicated groundwater monitoring infrastructure (monitoring wells) have been installed in the Northern Sacramento Valley, contributing to a better understanding and quantification of the region's groundwater drawdown and recharge characteristics. The proposed project includes the installation of additional monitoring wells to further contribute to existing groundwater monitoring databases. The purpose of this task is to:

- Establish a reliable baseline of hydrogeologic data
- Fill data gaps
- Measure drawdown during aquifer performance tests
- Monitor groundwater recharge
- Evaluate well performance and pumping impacts

Dedicated groundwater monitoring wells provide data regarding the depths of different aquifers. Small diameter PVC pipes with perforations at varying depths would be placed near an existing production well and measurements of groundwater depth and quantity are made at different times to assess local groundwater recharge and recovery.

The proposed monitoring wells cannot be used for or retrofitted for groundwater extraction or production of water. Once the monitoring project is complete, the monitoring wells will be integrated into the cooperative DWR-Butte County DW&RC groundwater monitoring network.

GROUNDWATER MONITORING WELL LOCATIONS AND SETTING

A total of seven monitoring well sites have been identified for this project. Based on existing funding and the uncertainty of the precise depth of each well, funding may not support the installation of all seven wells, however, all seven sites have been evaluated for potential environmental resources and factors. Aerial photos of individual monitoring well sites are included in Appendix C.

In addition, three existing wells have been identified that would provide additional data for modeling and recharge assessment, these wells are MW-LTR-1, MW-ESQ-w, and MW-PNZ-1, refer to **Figure 1**. These wells would be fitted with transducers, to record groundwater level and temperature data. No other changes to existing wells would be made.

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The monitoring wells are all located in Butte County, either adjacent to active agricultural land or within previously disturbed areas. **Table 3** provides general setting information for each proposed monitoring well.

Table 3: Proposed Groundwater Monitoring Well Sites Setting Summary

Monitoring Well Sites	General Location	Surrounding Land Use Designations and Zoning	Soil Characteristics
MW-ESQ-1	Located on the Esquon Ranch property; ±0.5 miles northwest of the Durham-Dayton Highway/SR99 interchange.	Land Use: OFC-Orchard and Field Crop; I-Industrial. Zoning: A-Agricultural, 40 acre minimum parcel size; M-1 Light Industrial.	Tuscan-Fallager-Anita, Gravelly Duripan, Complex, 0 to 3 percent slopes; not prime
MW-CSU-1	Located at the CSUC Farm; south of Chico; between Little Chico Creek and Comanche Creek.	Land Use: OFC-Orchard and Field Crop. Zoning: A-Agricultural, 20 acre minimum parcel size.	Chico Loam, 0 to 1 percent slopes; Almendra Loam, 0 to 1 percent slopes; prime
MW-CRL-1	Located on the M&T Ranch property; west of Chico, on Crouch Lane.	Land Use: OFC-Orchard and Field Crop. Zoning: A-Agricultural, 10 acre minimum parcel size.	Chico Loam, 0 to 1 percent slopes; prime Almendra Loam, 0 to 1 percent slopes; prime
MW-M&T-1	Located on the M&T Ranch property; southwest of Chico, east of River Road; between Little Chico Creek and Comanche Creek.	Land Use: OFC-Orchard and Field Crop. Zoning: A-Agricultural, 40 acre minimum parcel size. Adjacent lands are under Williamson Act contract.	Bosquejo Clay, 0 to 1 percent slopes; prime
MW-PIV-1 MW-PIV-2	Located ±2.25 miles west of SR99 on Wilson Landing Road.	Land Use: OFC-Orchard and Field Crop. Zoning: A-Agricultural, 40 acre minimum parcel size.	Haploxerolls Clay Loam, 0 to 2 percent slopes; prime
MW-RON-1	Located ±0.75 miles east of SR99, off Gaia Way.	Land Use: OFC-Orchard and Field Crop; GOL-Grazing and Open Land. Zoning: A-Agricultural, 40 acre minimum parcel size.	Charger Fine Sandy Loam, 0 to 1 percent slopes; prime Redtough-Fallager-Anita, Gravelly Duripan Complex, 0 to 3 percent slopes; not prime

GROUNDWATER MONITORING WELL SITING CRITERIA

Preparing sites for installation of the monitoring wells may involve the following:

- Mobilization and demobilization of drilling equipment
- Support vehicle traffic, i.e., cars, trucks, water tanker truck, dump truck, front end loader
- Clear an 100x100 foot area for drilling
- Disperse up to 35 cubic yards of drilling spoils per monitoring well

Each of the monitoring well sites is located in an area that is currently used for agricultural maintenance activities, i.e., parking areas. These sites are immediately adjacent to existing agricultural land uses, including orchards and grazing lands. Drilling spoils would be dispersed within the corresponding parcels, all of which are large enough to accommodate the additional material and currently disturbed.

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The specific well installation location within each monitoring well site will be identified by a registered geologist accompanied by a qualified biologist and archaeologist to ensure that potential biological and cultural/archaeological resources are avoided, including, but not limited to: Waters of the United States; Waters of the State; wetlands and vernal pool features; riparian habitat or other sensitive communities; threatened and endangered species; candidate, sensitive or special status species; historical, archaeological or paleontological resource or site; and disturbance of human remains. In addition, the qualified biologist will assist in locating sites that would not result in the dredge or fill, either direct and permanent or indirect and temporary, of Waters of the United States, nor result in the discharge of dredged or fill material in navigable waters. In following these siting criteria, a Clean Water Act Section 404 Nationwide Permit, Section 401 Water Quality Certification, and an application under California Fish and Game Code Section 1602 for a Streambed Alteration Agreement would not be necessary. Due to the minimal area required for monitoring wells (less than one acre) a Stormwater Pollution Prevention Plan will not be necessary.

Mobilization of equipment and installation activities may potentially disturb plant and wildlife species in the immediate vicinity of each well location. Section 4.4 of the Initial Study Checklist identifies mitigation measures that would ensure that potential environmental resources and factors are avoided.

GROUNDWATER MONITORING WELL SITES TASK DETAILS AND MONITORING

Activities associated with installation and data collection of monitoring wells includes the following activities:

- Drill a 6 to 8 inch diameter pilot borehole up to 1,000 feet deep
- If mud-rotary drilling methods are used, run a down-hole geophysical survey within the pilot borehole
- Physical characterization soil cores (boring logs) by licensed geologist
- Enlarge pilot borehole to a diameter of 12 to 16 inches; install groundwater monitoring wells, per Butte County and applicable regulatory requirements
- Drilling schedule will be approximately 1 to 2 weeks, depending on the depth of the monitoring well; monitoring wells will be installed in late summer or early fall, prior to the rainy season
- Perform elevation and coordinate surveys for each site by a licensed surveyor

Installation of up to 7 triple completion monitoring wells are planned for the proposed project. The identified locations for these wells are focused around existing groundwater irrigation production wells screened within the Lower Tuscan Aquifer.

Installation of groundwater monitoring wells requires a well construction permit from Butte County (per County Code Chapter 23B). As part of obtaining the well permit, a well construction work plan will be prepared as required by the County and the California Department of Water Resource Standards (DWR, 1981, 1991). This work plan, including the anticipated well designs, will be submitted to DW&RC for approval. Following procuring the permits and prior to drilling, the Underground Service Alert (USA) will be contacted for clearance of underground utilities.

The equipment will be arranged onsite to minimize impact to surrounding operations and site conditions. The drilling program proposes the use of the reverse circulation dual tube and/or air-rotary casing hammer (ARCH) drilling method for wells completed to depths up to 300 feet below ground surface (bgs) and borehole diameters equal to or less than 12-inches. However, the anticipated drilling depths are up to 1,000 feet bgs. The dual tube method is capable of reaching depths of 1,000 feet and allows collection of

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both depth-discrete lithologic and water samples. The dual tube method also allows estimates of water production within zones during drilling. In the case that the drilling method is incapable of achieving these depths, the drilling method will be converted to mud rotary.

In the event of mud rotary drilling the mud will be contained with a steel mud basin and recycled throughout the drilling. Formation drill cutting will be removed using a portable sand cone and shaker table. The drilling cuttings will be spread at each site within the 100x100 foot cleared area to protect the monitoring well from surface runoff. It is anticipated that a 1,000 foot deep borehole will yield approximately 35 cubic yards of material (drilling spoils). Water produced during drilling will be discharged to land surface to be utilized within the agricultural setting.

Once the desired depth of the borehole has been obtained, well installation methods will be consistent with Chapter 23B of the Butte County Code. Well casing (blank and screen) is anticipated to consist of 2.5-inch diameter (outside diameter), schedule 80 PVC. Triple completion wells screens and casing will be located in the borehole using centralizers. Monitoring wells of this size cannot be converted to production wells. Gravel pack will be placed at each screen interval and the well surged to settle the gravel pack around the well screen. Well surging will continue until the gravel pack stops settling (preliminary development). Additional gravel pack will then be added to the desired depth. A bentonite seal at least 2-feet thick will be placed immediately above the gravel pack. A volume calculation will be conducted to estimate the volume of a bentonite based grout needed to place between the lower screen and upper screen. Fine mesh sand will then be placed to 1 foot below the next screen interval and the process for placement of gravel pack and bentonite seal repeated as discussed above for the remaining completions. The upper most annular space will then be grouted with a bentonite or cement grout to approximately 2-feet bgs.

The wellhead completion will then be placed as specified by the County, **Figure 5**. No earlier than 24-hours after the grout placement, the well(s) will be developed using one or more of these methods: surging, air lifting, over pumping, and bailing. Generally, each well will be developed until it is free of suspended sediment and turbidity values are less than 10 NTU. After completion, the wells will be surveyed to provide elevation and coordinate surveys for each well site. In addition, each well will be equipped with battery operated pressure transducer-data loggers.

Figure 5: Sample wellhead completion (Photo)



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3.6.5 AQUIFER PERFORMANCE TESTING

Aquifer performance testing will collect basic aquifer data regarding transmissivity and storage in order to gain a better understanding of the vertical interformational leakage between the Lower Tuscan Formation aquifer system and other hydraulic units. Aquifer recharge and recovery will be monitored with the monitoring wells. These data will be used to assess input parameters used for the Butte Basin Groundwater Model. The aquifer performance testing will be conducted at existing irrigation and production wells – no new production wells will be constructed for this project. The purpose of the aquifer performance test is to collect data under controlled groundwater pumping conditions.

AQUIFER PERFORMANCE TESTING SITES LOCATIONS AND SETTING

A total of three performance testing well sites have been identified for this project; these are existing water production/irrigation wells. The location for the three tests will occur at Rancho Esquon, M&T Ranch, and the Shelton Property, refer to Figure 1. Irrigation Wells are identified as “IW.” **Table 4** provides summary data for existing irrigation wells that will be used for aquifer performance testing.

Table 4: Aquifer Monitoring Performance Well Testing Sites Summary

Performance Well Sites	General Location, Land Use and Zoning	Well Information
IW-RON-1	<ul style="list-style-type: none"> • Located ±0.75 miles east of SR99, off Gaia Way • Land Use: OFC-Orchard and Field Crop; GOL-Grazing and Open Land. Zoning: A-Agricultural, 40 acre minimum parcel size. 	<ul style="list-style-type: none"> • Pump Type: Electric Turbine • Pumping Rate: 1,100 gpm • Static Depth to Water: 28 • Boring Depth (bgs): 544 • Screen Intervals: 490-510 • Surface Elevation (above msl): 212
IW-M&T-1	<ul style="list-style-type: none"> • Located on the M&T Ranch property; southwest of Chico, east of River Road; between Little Chico Creek and Comanche Creek. • Land Use: OFC-Orchard and Field Crop. Zoning: A-Agricultural, 40 acre minimum parcel size. Adjacent lands are under Williamson Act contract. 	<ul style="list-style-type: none"> • Pump Type: Electric Turbine • Pumping Rate: 2,500 gpm • Static Depth to Water: 13 • Boring Depth (bgs): 640 • Screen Intervals: 150-170, 190-210, 240-260, 340-390 • Surface Elevation (above msl): 124
IW-ESQ-13	<ul style="list-style-type: none"> • Located on the Esquon Ranch property; ±0.5 miles northwest of the Durham-Dayton Highway/SR99 interchange. • Land Use: OFC-Orchard and Field Crop; I-Industrial. Zoning: A-Agricultural, 40 acre minimum parcel size; M-1 Light Industrial. 	<ul style="list-style-type: none"> • Pump Type: Electric Turbine • Pumping Rate: 1,200 gpm • Static Depth to Water: 35 • Boring Depth (bgs): 620 • Screen Intervals: 50-600 • Surface Elevation (above msl): 165

AQUIFER PERFORMANCE TESTING SITES SITING CRITERIA

Since aquifer performance tests will use existing irrigation production wells, no new wells will be constructed. No new well locations are identified.

AQUIFER PERFORMANCE TESTING TASK DETAILS AND MONITORING

Aquifer performance testing will be conducted on three existing irrigation wells. The irrigation wells to be utilized are existing groundwater pumping wells with operating pumps and are connected to irrigation distribution systems. The water extracted will be used as part of existing irrigation practices and distributed according to normal operating conditions at each location. These tests will be compliant with

3.0 PROJECT DESCRIPTION

the Regional Water Quality Control Board General Discharge Permit, where applicable and no additional permitting will be required.

Production wells identified for use during these aquifer performance tests are equipped with properly sized pumps for testing, flow meters, and have existing electrical power. Testing includes the observation of existing irrigation pumping activities associated with the irrigation or production well. Observation/testing will be conducted over a minimum of a 10-day period. The effect of the controlled and carefully monitored groundwater pumping will be observed in adjacent monitoring wells. The rate of pumping shall be determined based on the current (baseline) capability of the well and existing pump. The pumping rate will remain constant throughout the test observation duration. When the irrigation or production pumping is stopped, water level recovery will be measured for a period of approximately 10 days.

Throughout each test, water level data will be collected using submersible pressure transducers and data loggers, in particular In-Situ® Level Trolls 500 or 700 series. These transducers are capable of measuring water levels to within 0.01 feet and temperature to 0.01 °C. The logging capabilities and data storage allow for a variety of programmable solutions to observe subtleties necessary to accurately evaluate aquifer properties. Hand measurements will be made throughout the test to confirm transducer readings.

Following the completion of each constant rate test, a water sample will be collected and analyzed using a field meter for general physical parameters of pH, temperature, electrical conductivity (EC), oxidation-reduction potential (ORP), and dissolved oxygen (DO). The sample will also be submitted to a California certified analytical laboratory under chain of custody for analysis of major cations and anions, standard minerals, minor elements, nutrients, and oxygen isotopes.

For each test, the following components will be performed to characterize the aquifer being tested: background monitoring, constant rate testing (constant test), and recovery testing. Background monitoring will be performed approximately 2-weeks prior to performance of the test and will include water level information collected by the transducers. If the existing pump and well setup allow, step drawdown testing (step test) may also be conducted.

The use of existing and normally operating agricultural pumping wells minimizes the disturbance of the area and does not involve the pumping and distribution of water outside of that which normally would occur at each well location.

3.7 SUMMARY

As indicated above, the fieldwork components for the proposed project include:

- Soil Infiltration Testing
- Stream Gauge Installation and Monitoring
- Stream Aquifer Interaction / Piezometer Installation and Monitoring
- Monitoring Well Installation
- Aquifer Performance Testing

Because these tasks may involve the installation of equipment that could result in a physical change to the environment, they are the focus of Initial Study analysis. **Table 4** summarizes the fieldwork activities and their potential physical effects.

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Table 5: Summary of Fieldwork Activities

Task	Location of Activity	Activity	Potential Environmental Resources and Factors
Soil Infiltration Testing	10 locations located throughout project area (plus 2 alternative sites)	Clear 8x8 foot surface area	<ul style="list-style-type: none"> Limited vegetation clearing Temporary noise if auger used
		Dig a 3-foot hole to install infiltrometer	<ul style="list-style-type: none"> Could occur within jurisdictional riparian habitat, depending on distance from stream
Stream Gauging	2 sites on each of the 6 identified stream reaches	Some existing gauges may be retrofitted with equipment	<ul style="list-style-type: none"> None: Upgrades to existing facilities a part of normal operating and maintenance activities
		New staff gauges may be installed	<ul style="list-style-type: none"> Activities in the streambed; potential resources include fish migration and spawning habitat
Stream-Aquifer Interaction	24 piezometer wells (4 wells located within each of the 6 stream reaches)	Install piezometer wells; clear ±225 square foot area for each well	<ul style="list-style-type: none"> Could occur within jurisdictional riparian habitat, depending on distance from stream Temporary noise if auger used Disturb ±225 square foot area per site
	12 slug tests (2 for each piezometer well)	slug tests as part of piezometer well monitoring activities	<ul style="list-style-type: none"> None: part of piezometer well monitoring activities
	18 seepage meters (3 per stream reach, within each of the 6 stream reaches)	Seepage meter tests; press a 1-ft bucket or 2-ft drum, 4-inches into streambed	<ul style="list-style-type: none"> Activities would occur in the streambed; potential sensitive resources include fish migration and spawning habitat
Monitoring Well Installation	3 existing wells	Install transducers on existing wells	<ul style="list-style-type: none"> None
	7 new monitoring well locations identified east of the Sacramento River	Install monitoring wells; installation of wells is dependent on funding	<ul style="list-style-type: none"> Disturb approximately 100x100 foot area per site Temporary noise associated with installation
Aquifer Performance Testing	3 existing wells in Butte County, east of the Sacramento River	Monitor pumping of existing irrigation and groundwater extraction activities	<ul style="list-style-type: none"> None: water extraction would be part of normal operating procedures, water would be conveyed to existing irrigation systems

3.8 LOCAL GROUNDWATER MANAGEMENT

Butte County has sponsored and participated in a number of groundwater research and planning efforts for which the Lower Tuscan Aquifer Project will provide important data and analytic tools:

Butte County Code Chapter 23 B (Well Spacing Ordinance): Specifies procedures for the construction, placement and spacing of water wells, their operating capacities, and the acceptable techniques for destroying abandoned wells.

Butte County Code Chapter 33 (Groundwater Conservation Ordinance): Allows the County to better manage the County’s groundwater resources and protect against overdraft. Section 33-5 requires a permit, subject to California Environmental Quality Act (CEQA) review for the out-of-county export of groundwater. Section 33-6 similarly requires a permit and CEQA review for the substitution of groundwater for surface water that is transferred outside the County. To date, no permits have been applied for either Sections 33-5 or 33-6.

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Butte County Code Chapter 33A (Groundwater Management Ordinance): Requires the development of Basin Management Objectives (BMO's) for the monitoring of groundwater levels, groundwater quality, and land subsidence with the goal of better defining safe yields and overdraft on a sub-inventory unit level of geography. BMO's are locally developed guidelines for groundwater management that require extensive monitoring data.

Butte Basin Groundwater Model and Groundwater Management Plan (per Assembly Bill 3030): The Lower Tuscan Aquifer project will provide necessary data in support of Management Plan goals:

- Minimize the long-term drawdown of groundwater levels;
- Protect groundwater quality;
- Prevent inelastic land surface subsidence from occurring as a result of groundwater pumping;
- Minimize changes to surface water flows and quality that directly affect groundwater levels or quality;
- Minimize the effect of groundwater pumping on surface water flows and quality;
- Evaluate groundwater replenishment and cooperative management projects; and
- Coordination with neighboring jurisdictions and regional agencies through the Four County Memorandum of Understanding and membership in the Seven County Sacramento Valley Water Forum, California Irrigation Institute, Chico State Environmental Resources Program Advisory Panel and Northern California Water Association.

Many of the above efforts are components of Butte County's Integrated Water Resources Plan (IWRP), a locally-developed approach to water management policy, programs, and projects identified by stakeholders for maintaining and enhancing agricultural, environmental, and urban water uses in Butte County. The proposed project directly responds to the data requirements of several IWRP policy goals:

- Continue ongoing water resources efforts (project data will assist with Butte County Code Chapter 33 Groundwater Conservation Ordinance, update of Butte County Inventory and Analysis, Groundwater Management Plan, Groundwater Monitoring Program, etc.):
- Recommend that Basin Management Objectives support native vegetation (project data will assist in analysis of the relationship between natural vegetation above recharge zones and the underlying aquifer):
- Protect recharge areas through zoning (project will assist in identifying important recharge areas):
- Inform and educate the public about water (project includes a public outreach component); and
- Implement a Coordinated Management Program to improve flexibility and reliability of County water resources (project will provides monitoring to assess aquifer recovery over time)

3.9 PROJECT FUNDING

The Lower Tuscan Aquifer Monitoring, Recharge and Data Management Project is funded by Proposition 50, the Water Security, Clean Drinking Water, Coastal and Beach Protection Act of 2002. Included as part of Proposition 50 is the Integrated Regional Water Management (IRWM) Grant Program. This is a joint program between the Department of Water Resources (DWR) and the State Water Resources Control Board (State Water Board) which provides funding for projects to protect communities from drought, protect and improve water quality, and reduce dependence on imported water.

In the Proposition 50 Step II application process, this project was consolidated with a number of other projects. It subsequently became one of many projects identified in "Appendix A" of the Northern California Water Association's Sacramento Valley Integrated Regional Water Management Plan

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(Sacramento Valley IRWMP). Although the project is referenced with other projects in the Sacramento Valley IRWMP, the project is not related or tied to any Sacramento Valley IRWMP projects.

3.9.1 GRANT AGREEMENT

Butte County was awarded funding under the Proposition 50 Integrated Regional Water Management for two projects: the Paradise Ridge Water Supply Reliability Project and the Lower Tuscan Aquifer Monitoring, Recharge and Data Management Project. The Paradise Ridge Water Supply Reliability Project has been completed and was subjected to a separate CEQA document.

The Lower Tuscan Aquifer Monitoring, Recharge and Data Management Project grant application included a scientific investigation work plan which is to develop data and analytic tools to improve the understanding of the aquifer. This Initial Study and CEQA process describes the scientific investigation component and grant funded activities that may have an impact on the physical environment.

The grant agreement also consists of an outreach and education component that involves the Four County Memorandum of Understanding (MOU) Group. The Four County MOU Group consists of Butte, Colusa, Glenn, and Tehama Counties. In January 2006, the Counties of Butte, Colusa, Glenn, and Tehama entered into a MOU referred to as the Four County MOU. The 4 County MOU expressed a commitment to coordinate, collaborate, and communicate water resource issues. In 2009 the MOU was amended by adding Sutter County and committing to begin an Integrated Regional Water Management Planning Process. In 2010, the Four County MOU Group was renamed the Northern Sacramento Valley IRWMP Planning Group and began the process of adding Shasta County. The education and outreach activities are not part of the scientific investigation activities of Lower Tuscan Aquifer Monitoring, Recharge and Data Management Project and not subject to this Initial Study and CEQA process.

4.0 INITIAL STUDY CHECKLIST

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ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below could be potentially affected by this project; however, with the incorporation of mitigation measures, potentially significant project related impacts are reduce to a "less than significant" level (CEQA Guidelines 15382).

- | | | |
|--|--|---|
| <input type="checkbox"/> Aesthetics | <input type="checkbox"/> Agricultural/Forestry Resources | <input checked="" type="checkbox"/> Air Quality |
| <input checked="" type="checkbox"/> Biological Resources | <input checked="" type="checkbox"/> Cultural Resources | <input type="checkbox"/> Geology/Soils |
| <input type="checkbox"/> Greenhouse Gas Emissions | <input type="checkbox"/> Hazards/Hazardous Materials | <input type="checkbox"/> Hydrology/Water Quality |
| <input type="checkbox"/> Land Use/Planning | <input type="checkbox"/> Mineral Resources | <input type="checkbox"/> Noise |
| <input type="checkbox"/> Population/Housing | <input type="checkbox"/> Public Services | <input type="checkbox"/> Recreation |
| <input type="checkbox"/> Transportation/Traffic | <input type="checkbox"/> Utilities/Service Systems | <input type="checkbox"/> Mandatory Findings of Significance |

DETERMINATION

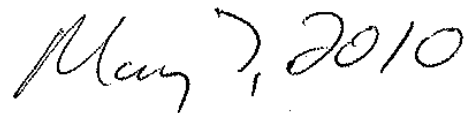
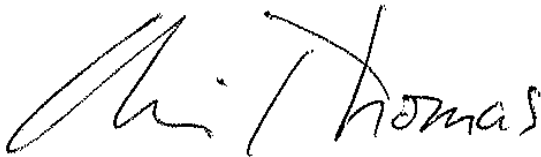
- I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

- I find that although the proposed project COULD have a significant effect on the environment, there will NOT be a significant effect in this case because revisions have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

- I find that the proposed project COULD have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

- I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

- I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.



Chris Thomas
Senior Planner
Butte County Department of Development Services

Date

4.0 INITIAL STUDY CHECKLIST

METHODOLOGY AND EVALUATION OF ENVIRONMENTAL IMPACTS

METHODOLOGY

For this analysis, a ¼ mile radius from the identified soil infiltration sites and proposed Monitoring Well Sites (**Figure 1**) was evaluated for potential sensitive environmental resources. For Stream Gauges and Stream Aquifer Interaction Sites, including piezometer wells and seepage meter tests, “stream reaches” were identified and evaluated for potential sensitive resources. Evaluating the surrounding area of sites and stream reaches allows flexibility in locating monitoring equipment and scientific measuring devices, so that potentially sensitive resources can be avoided.

Site visits to project areas were conducted to establish baseline conditions and assess the existing environmental setting. This allowed for a reconnaissance level evaluation of potential sensitive resources for each site or stream reach. The project team also reviewed existing documentation, including General Plan existing conditions reports and environmental documentation as well as other studies, reports and databases to further establish the environmental setting. This qualitative data has been incorporated into the Setting for each environmental topic area discussed in the Initial Study Checklist and serves as the basis of the Environmental Analysis.

EVALUATION

Per CEQA Guidelines Appendix G, the following criteria have been applied in the Environmental Analysis section discussed under each environmental topic area.

- 1) A brief explanation is required for all answers except “No Impact” answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A “No Impact” answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A “No Impact” answer should be explained where it is based on project-specific factors as well as general standards, (e.g., the project will not expose sensitive receptors to pollutants based on a project-specific screening analysis.)
- 2) All answers must take account of the whole action involved including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.
- 3) Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. “Potentially Significant Impact” is appropriate if there is substantial evidence that an effect may be significant. If there are one or more “Potentially Significant Impact” entries when the determination is made, an EIR is required.
- 4) “Negative Declaration: Less Than Significant With Mitigation Incorporated” applies where the incorporation of mitigation measures has reduced an effect from “Potentially Significant Impact” to a “Less Than Significant Impact.” The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from Section XVII, “Earlier Analyses,” may be cross-referenced).

4.0 INITIAL STUDY CHECKLIST

- 5) “Reviewed Under Previous Document.” Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063 (c)(3)(D). In this case, a brief discussion should identify the following:
 - a) Earlier Analysis Used: Identify and state where they are available for review.
 - b) Impacts Adequately Addressed: Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.
 - c) Mitigation Measures: For effects that are “Less Than Significant with Mitigation Measures Incorporated,” describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.
- 6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.
- 7) Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.
- 8) The explanation of each issue should identify:
 - a) The significance criteria or threshold, if any, used to evaluate each question; and
 - b) The mitigation measure identified, if any, to reduce the impact to less than significant.

4.0 INITIAL STUDY CHECKLIST

4.1 AESTHETIC/VISUAL RESOURCES:

Would the proposal:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect on a scenic vista?				X
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?				X
c) Substantially degrade the existing visual character or quality of the site and its surroundings?				X
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?				X

Setting:

The project area is located in the eastern portion of the Sacramento River Valley. The valley topography is gentle and flat, with elevations ranging from 60 to 200 feet above sea level. The foothills form a transitional area between the valley floor on the west and the mountains on the east and consist of rolling hills with elevations ranging from about 200 to 2,100 feet above sea level. The visual character of the foothills is less open than the valley, with scenic vistas along river and creek canyons and out across the Sacramento Valley.

There are no officially designated State scenic highways in Butte or Tehama County. Highway 70 north of the intersection with Highway 149 is included on the State's Master Plan and is considered an eligible State scenic highway. In the existing Butte County Zoning Ordinance, scenic routes and an area extending 350 feet from the centerline are zoned Scenic Highway. These sectors include portions of Highway 32 north of Chico, Highway 70 north of the Highway 149 intersection, Highway 191, Highway 162 near Lake Oroville, the Skyway through Butte Creek Canyon, Forbestown Road, and Lumpkin Road. The Tehama County General Plan proposes portions of Highway 32, adjacent to Deer Creek in eastern Tehama County, as a County scenic highway.

Environmental Analysis:

Butte County has not defined significant aesthetic/visual resources within the County; however, the sensitivity of a view and the visual dominance of a project may be used to evaluate impacts to visual resources. The sensitivity of a view is characterized by the visual qualities of both nearby and distant landscapes (e.g., their form, texture, color, massing, and definition) and how development might obscure, contrast with, or otherwise affect those visual qualities. Sensitive views are not expected in the vicinity of the project sites and, regardless, the proposed monitoring equipment is unobtrusive and its installation is not expected to have a significant impact upon a visual resource.

a – d) No Impact. Stream infiltration sites and stream-aquifer interaction sites, which include the installation of piezometer wells and seepage meter testing equipment would occur below ground and would not substantially degrade the existing visual character or quality of a site or its surroundings.

Existing stream gauging stations would be used when feasible. Currently, existing facilities on Butte Creek and Big Chico Creek are anticipated to be used. However, for the purposes of this analysis, it is assumed that new stream gauges would be installed in all streams. The installation of 2 staff gauges in each of the streams would either be attached to existing bridges or structures within the streambed would be installed for the duration of the project. Installation of staff gauges would not require the removal of vegetation or a substantial change to the surrounding environment.

4.0 INITIAL STUDY CHECKLIST

The proposed locations for the monitoring well sites are located within areas that are in agricultural production or are subject to agricultural activities, including agricultural equipment parking and staging areas and access roads. The areas surrounding the proposed monitoring well sites, which are located adjacent to the existing performance test wells, include agricultural land uses and agricultural infrastructure including access roads, wells, and ditches and canals for water transport.

The installation and operation of project monitoring and data collection equipment would not result in a substantial change to the existing environment as to create a significant change or obstruct or adversely affect scenic vistas. In addition, installation and operation of monitoring equipment would not substantially change or degrade the existing visual character or quality of the individual sites and their surroundings. Therefore, there are no impacts to the visual character of the area.

Additionally, project activities are not within designated state scenic highways. Monitoring facilities, including SI-DR-3, which would be located in the vicinity of Highway 191, a Butte County designated scenic highway, would be temporary, installed below ground, and would be unobtrusive. Other designated scenic highways, including Highway 70 east of the Highway 149 in Butte County and Highway 32 in Tehama County are not located adjacent to proposed project monitoring facilities. No impacts would occur within or adjacent to a state scenic highway.

The drilling of monitoring wells would occur 10 to 12 hours per day, Monday through Friday. With the exception of MW-RON-1, proposed monitoring wells would be located adjacent to existing agricultural activities and would not be located near potential sensitive receptors, such as residential homes. Monitoring well installation activities would occur during the daytime, Monday through Friday, therefore no temporary nighttime lighting would be necessary for well installation. MW-RON-1 would be located approximately 500 feet from an existing residential land use. Again, since monitoring well installation activities would occur during the daytime, Monday through Friday, and no nighttime lighting is needed, no lighting and glare impacts would occur to this residence. In addition, project facilities do not make use of any permanent lighting source and will not create any light or glare impacts.

Mitigation: None Required

4.2 AGRICULTURAL AND FOREST RESOURCES:

Would the proposal:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?				X
b) Conflict with existing zoning for agricultural use, or a Williamson Act Contract?				X
c) Conflict with existing zoning for, or cause rezoning of, forest land (Public Resources Code §12220(g)), timberland (Public Resources Code section §4526), or Timberland Production (Government Code §51104(g))?				X
d) Result in the loss of forest land or conversion of forest land to non-forest use?				X
e) Involve other changes in the existing environment which, due to their location/nature, could result in conversion of Farmland, to non-agricultural use or of forest land to non-forest use?				X

4.0 INITIAL STUDY CHECKLIST

Setting:

Butte and Tehama County are located in the Sacramento River Valley, an area subject to extensive agricultural activities. The lands that surround the Sacramento River are prime agricultural lands for irrigated crops with the foothills providing open grazing land. The majority of both Counties' farmland is located in the area between the eastern bank of the Sacramento River and the foothills of the Sierra Nevada and Southern Cascade mountain ranges (Butte County, 2010 and Tehama County, 2007).

Environmental Analysis:

Project facilities extend from sites east of the Sacramento Valley to the foothills. Soil infiltration sites are generally located in areas of open land or open grazing land. Stream gauge equipment, piezometer wells and seepage tests that evaluate the stream-aquifer interaction would be located within the six identified stream reaches. These areas are located east of the valley and extend into the foothills. Monitoring wells would be used to evaluate the recharge and recovery of the Lower Tuscan Aquifer during and after groundwater extraction for irrigation purposes. Therefore, proposed monitoring wells are located adjacent to agricultural land uses. However, proposed locations are in areas that are used for ancillary agricultural activities, such as parking areas, agricultural equipment staging and turnaround areas, irrigation preparation activities, and storage.

a – e) No Impact. Monitoring well sites located in areas where the soils are considered prime farmland include:

- MW-CSU-1 Chico Loam, 0 to 1% slopes (Prime); Almendra Loam, 0 to 1% slopes (Prime)
- MW-CRL-1 Chico Loam, 0 to 1% slopes (Prime); Almendra Loam, 0 to 1% slopes (Prime)
- MW-M&T-1 Bosquejo Clay, 0 to 1% slopes (Prime)
- MW-PIV-1; MW-PIV-2 Haploxerolls Clay Loam, 0 to 2% slopes (Prime)
- MW-RON-1 Charger Fine Sandy Loam, 0 to 1% slopes (Prime); Redtough-Fallager-Anita, Gravelly Duripan Complex, 0 to 3% slopes (Not Farmland)
- MW-ESQ-1 Tuscan-Fallager-Anita, Gravelly Duripan, Complex, 0 to 3% slopes (Not Farmland); Adjacent to prime farmland land on the Esquon Ranch

The proposed monitoring well sites would occur within areas used for agricultural support activities such as agricultural production staging, equipment parking and turnaround areas, irrigation production wells, and maintenance buildings. These sites are located adjacent to agricultural activities but are not in agricultural production. The staging area associated with the drilling, construction and installation of the monitoring wells would generally include an area less than one-quarter acre in size. Upon completion of well installation, the surrounding disturbed land would be restored to its original condition and the wellhead would occupy an area of less than 10 square feet. The installation of the monitoring wells would be for groundwater monitoring, particularly associated with the Lower Tuscan Aquifer. Once the Lower Tuscan Aquifer study is complete, the monitoring wells would become part of the DWR-DW&RC's groundwater monitoring network. Groundwater monitoring wells are an associated agricultural facility in that they monitor drawdown and recharge. There are no impacts to prime farmland.

In addition, existing monitoring wells that would be used for monitoring and data collection are located in areas that are designated either prime or not prime farmland. However, because these wells are existing no impacts would occur to prime farmland soils.

Soil infiltration sites and activities within the stream reaches (including the installation of stream gauges, piezometers and conducting seepage meter tests) are located in Butte County areas that are zoned U-

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Unclassified, Agricultural (A-20, A-160), S-H-Scenic Highway, FR-Foothill Recreational (FR-40), M-1-Light Industrial, SR-Suburban Residential, and OS1-Primary Open Space in the City of Chico and UA-AP-Upland Agricultural-Agricultural Preserve in Tehama County. Monitoring well sites are located in areas zoned Agricultural, including A-10, A-20, A-40 (Agricultural with 10, 20, and 40 acre minimum parcel sizes, respectively).

MW-M&T-1 is located adjacent to lands under Williamson Act contract. The installation and operation of groundwater monitoring wells is an allowable use within an agricultural zone that is necessary and compatible with agricultural operations and production. The wells would be located in areas that serve as agricultural production staging, equipment parking and turnaround areas, irrigation production wells, and maintenance buildings, and other similar agricultural management facilities. Therefore, the project would not result in the conversion of any farmland, does not conflict with existing zoning or a Williamson Act contract, and will not involve other changes in the existing environment that could result in the conversion of farmland to a non-agricultural use. Therefore, there are no impacts.

Project monitoring and data collection equipment will not be located in areas that are zoned as forest land, timberland, or areas zoned for timber production. The project would not result in the lost of forest land or conversion of forest land to a non-forest use because these land uses are not located adjacent to project areas. Therefore, the project has no impact on forest land resources.

As stated in the discussion items a) and b) above, the project will not result in the conversion of any farmland, does not conflict with existing zoning or a Williamson Act contract, and will not involve other changes in the existing environment that could result in the conversion of farmland to a non-agricultural use. In addition, as stated in discussion items c, d) above, the project will not result in the conversion of any forest land, timberland, or land zoned as timberland production, and will not involve other changes in the existing environment that could result in the conversion of forest land to a non-forest use. Therefore, there are no impacts to agricultural and forestland resources.

Mitigation: None Required

4.3 AIR QUALITY:

Would the proposal:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Conflict with or obstruct implementation of the applicable air quality plan?			X	
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?		X		
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?		X		
d) Expose sensitive receptors to substantial pollutant concentrations?				X
e) Create objectionable odors affecting a substantial number of people?				X

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Setting:

Both the California Air Resources Board and Environmental Protection Agency have established air pollution standards in an effort to protect human health and welfare. A geographic region may be designated as an unclassified, attainment, or nonattainment area for state and/or federal criteria pollutants. The proposed research activities would occur in Tehama and Butte Counties, which are located within the Northern Sacramento Valley Air Basin (NSVAB). As identified in the following table, both counties have been designated as nonattainment areas for ozone and particulate matter based on state and/or federal standards.

The Tehama County Air Pollution Control District (TCAPCD) and Butte County Air Quality Management District (BCAQMD), in coordination with other districts, have prepared the NSVAB Air Quality Attainment Plan (2006). Regional air pollution management is guided in large part by the Air Quality Attainment Plan, which includes a number of adopted feasible control measures. The following table lists the attainment status for both counties relative to state and federal criteria pollutants:

Table 6: Attainment Status for Criteria Pollutants

<u>County</u>	<u>Pollutant</u>	<u>State</u>	<u>Federal</u>
Tehama	1-hour Ozone	Nonattainment	--
	8-hour Ozone	Nonattainment	Attainment
	Particulates (PM10)	Nonattainment	Attainment
Butte	1-hour Ozone	Nonattainment	--
	8-hour Ozone	Nonattainment	Nonattainment
	Particulates (PM10)	Nonattainment	Attainment
	Particulates (PM2.5)	Nonattainment	Nonattainment

The *Planning and Permitting Handbook* (TCAPCD, 2009) and *CEQA Handbook* (BCAQMD, 2008) provide additional guidance during project-level analyses of potential air quality impacts. Logically, much of the discussion in the districts' handbooks is centered on ozone and particulate matter. Both districts establish comparable thresholds of significance for air quality, as identified below:

- Project emissions compared to district's emission thresholds
- Consistency with the NSVAB Air Quality Attainment Plan
- Ambient pollutant concentrations compared to State and Federal health standards
- Special conditions, such as exposure to toxic air contaminants and objectionable odors

Environmental Analysis:

As discussed previously, the proposed activities would be comprised of the following eight (8) fundamental tasks: 1) Technical Steering Committee, 2) Geodatabase Development, 3) Soil Infiltration/Infiltration Testing, 4) Stream Gauging, 5) Stream-Aquifer Temperature Gradient Measurements, 6) Install Groundwater Monitoring Infrastructure, 7) Performance Testing, and 8) Public Outreach, Education and Coordination. There would be no land use changes or developments associated with the proposed research activities and there would be no long-term emissions of criteria pollutants generated by the proposed project

As Tasks 1, 2, and 8 are organizational and administrative in nature, they would not result in emissions. Similarly, as they would involve the use of existing agricultural facilities and monitoring infrastructure, Tasks 4 and 7 would not result in emissions. Tasks 3 through 7 involve the installation of monitoring and assessment equipment, fieldwork, and scientific data collection. For example, Tasks 3 and 4 could

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require the temporary use of a powered auger if digging by hand is not feasible. The installation of groundwater monitoring wells under Task 6 would require the use of a truck-mounted drill.

b, c) Less Than Significant With Mitigation Incorporated. Relative to indirect sources, vehicular travel between sites, the use of gas-powered equipment and the use of a truck-mounted auger would result in minimal, temporary emissions.

Ground disturbances would occur during the installation of monitoring wells, infiltrometers, and piezometers. Regional climatic conditions, particularly during the summer months, can contribute to fugitive dust emissions. The work associated with the installation of monitoring equipment and drilling of monitoring wells would be temporary and involve limited areas of disturbance. For example, the proposed project would not involve grading, excavations or the use of haul vehicles to transport soils.

Mitigation Measure 4.3.1 (Air Quality)

To minimize fugitive dust, particulate matter and exhaust emissions during drilling and installation activities and ensure enforcement of policies pertaining to air quality, the following measures, to the extent they are applicable and practicable, shall be included in all plans and contracts for the project:

Fugitive Dust

- Water shall be applied as needed prior to any clearing or earth movement to minimize dust
- On-site vehicles limited to a speed which minimizes dust emissions on unpaved roads
- All visibly dry disturbed soil surface areas of operation shall be watered to minimize dust
- Existing roads and streets adjacent to the project will be cleaned as warranted
- Vehicles entering or exiting unpaved work areas shall travel at a speed which minimizes dust
- Workers shall park in designated parking areas(s) to help reduce dust
- Spoils/soil piles shall be moistened if dust is being emitted from the pile(s). Adequately secured tarps, plastic or other material may be required to further reduce dust

Equipment Exhaust

- Equipment shall be maintained in good repair and proper tune according to the manufacturer's specifications
- Unnecessary vehicle idling shall be restricted to a maximum of 5 minutes; Equipment and vehicles shall be turned off when not in use
- To the extent feasible, maximize the use of reformulated and emulsified fuels, catalyst and filtration technologies, and diesel equipment meeting CARB's 1996 or newer certification standard for off-road heavy-duty diesel engines

Plan Requirements: Measures, to the extent they are applicable and practicable, shall be included in all applicable plans and documents for the project.

Timing: Inclusion of measures in applicable plans and contracts to occur prior to installation of corresponding monitoring equipment. Implementation of applicable measures shall occur during installation of monitoring equipment.

Monitoring: Butte County Department of Development Services and Department of Water and Resource Conservation shall ensure the inclusion of applicable measures in plans and work contracts.

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The proposed scientific data collection would not result in potential long-term effects related to air quality. Mitigation Measure 4.3.1 (Air Quality) would reduce the potential short-term emissions to less than significant levels. Therefore, relative to these air quality factors, the proposal would not result in a serious or major disturbance to an environmental resource.

a, d, e) No Impact. The project would not significantly conflict with, or obstruct implementation of, the 2003 Air Quality Attainment Plan. Similarly, the proposed project would neither expose sensitive receptors to substantial pollutant concentrations nor result in objectionable odors affecting substantial numbers of people. Therefore, there would be no impact.

Mitigation: None Required

4.4 BIOLOGICAL RESOURCES:

Would the proposal:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?		X		
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?		X		
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?		X		
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?		X		
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?				X
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other local, regional, or state habitat conservation plan?				X

Setting:

Butte and Tehama Counties are located approximately midway between the City of Sacramento and the Oregon border. The west boundary of Tehama County is in the northern Coast Range while the eastern boundary is near the southern terminus of the Cascade Range. The Sacramento River bisects the county from north to south. Butte County extends from the Sacramento River to the Sierra Nevada and Cascade Ranges, where elevations exceed 8,000 feet above sea level. The climate is typical of the California Central Valley, with hot, dry summers and mild, somewhat wet winters. Agriculture, including farming, ranching, and timber production, continue to be major contributors to the regional economy.

The proposed project will occur within a variety of habitat types including annual grassland, riparian, oak woodlands, and adjacent to active agricultural/cropland, as described below:

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SI Sites: Soil infiltration testing will measure the rate at which soil is able to absorb water and will be used to assess the passive and active water infiltration capacity of the Lower Tuscan Aquifer. Passive infiltration capacity refers to the potential for water to infiltrate the exposed Lower Tuscan Aquifer soils across the study area; active infiltration capacity refers to potential for water to infiltrate areas near active streams that could serve as active groundwater recharge areas (that is, areas where surface water would be spread and allowed to percolate down into the aquifer). A total of 12 soil infiltration testing areas have been identified for this project (10 sites to be installed, 2 alternative sites). Access to sites will be by vehicles where a road is present or by foot if no road is present. Site preparation associated with installing the monitoring equipment includes the use of hand tools to clear the 8 square foot area and digging a 3-foot test hole in order to install one 24 inch diameter double-ring infiltrometer at each site. If access allows, a backhoe may be used to dig the 3-foot test hole. Once installed, the infiltrometer tests will be conducted at each site for up to 12 hours. Immediately adjacent to the infiltrometer test location, a complete soil profile and soil log will be generated from a hand augured 2-inch diameter borehole to a depth of 5-feet below the ground surface.

These designated sites are located within or in close proximity to annual grassland, oak woodland, and riparian habitats that may support wetlands. Thus, the siting of each soil infiltration site will include the presence of a qualified biologist and botanist in order to ensure the complete avoidance of wetlands and other special-status biological and natural resources.

Stream Reaches: The stream gauges and stream-aquifer interaction sites (piezometer wells) are all located within the designated stream reaches along Antelope Creek, Mill Creek, Deer Creek, Big Chico Creek, Butte Creek, and Little Dry Creek. Each of these stream reaches incorporate the open water within the stream channel, a corridor of riparian vegetation as well as associated upland habitat characterized as annual grassland and oak woodland. "Stream reaches" have been designated along each stream where project activities would occur. A stream gauge will be established at either end of each stream reach (12 in all).

Stream gauging along perennial streams will be used to determine the volume and rate of surface water that recharges into or is discharged from exposures of the Tuscan Formation. The project proposes to use existing stream gauge facilities, when available, or install temporary staff gauges to gather this data. Staff gauges consist of a long ruler attached to a mounting pole. The resulting data will provide a quantitative assessment of the water exchange relationship between the Tuscan Formation Aquifer system and overlying streams at selected sites. Six streams have been identified as part of the project including Antelope, Mill, Deer, Big Chico, Butte, and Little Dry creeks.

Access to sites will be by vehicles where a road is present or by foot if no road is present. Installation of staff gauges will consist of either hand-driving a 2-inch diameter galvanized steel post into the stream bed or attaching the gauge to an existing structure, such as a bridge. Each gauge will also consist of a temporary stilling well, within the mounting post, in which a pressure transducer and temperature data logger will be placed. The staff gauge installation process would take approximately 2 to 6 hours and will be conducted during the summer months when flows are low. Following the installation or retrofitting activities, monitoring will be conducted bi-weekly from April to November and will consist of visually reading the staff gauge and downloading the transducer data to a field computer (20 to 40 minutes).

The stream-aquifer interaction sites are areas where measurement of the stream aquifer temperature gradient will be inventoried. This measurement is used to determine how groundwater is influenced by the influx of surface waters into the aquifer or, conversely, the movement of groundwater towards the surface. The temperature gradient adjacent to the streams provides information regarding the vertical

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direction of water movement and the amount of water a stream is losing or gaining from an aquifer. Data will be used to create aquifer depth-temperature tables for a report analyzing the interaction of surface waters in the stream bed with the movement of water into and out of the aquifer system to assess overall recharge. A total of 24 stream-aquifer interaction sites will be located outside the stream channel within each of the six stream reaches. Each stream reach will contain four stream-aquifer interaction sites where piezometer wells will be installed. The piezometers will be installed either by a hand-auger and roto-hammer or small auger on a limited access mobile drill rig (only if existing access road are available) to depths of up to 50 feet. Site preparation for installation of the piezometer wells will include the clearing of an 8 square foot area, drilling a 4 to 6 inch borehole up to 50 feet in depth, and performing an elevation and coordinate survey. The piezometer wells would be removed following the conclusion of the monitoring period.

Slug testing would be performed on a minimum of two piezometer wells within each stream reach and seepage meter testing will be conducted where the streambed is thin in the vicinity of each piezometer well. The slug testing will not require additional instrumentation to be installed. Three seepage meter tests will be conducted one time during the summer months in the vicinity of each piezometer well. The seepage meter tests will consist of submerging a small bucket (1 foot in diameter) and/or a drum (2 feet in diameter) into the surface-water of the stream and pressing it up to 4 inches into the streambed to calculate the seepage rate over a period of 1 hour. The bucket or drum is removed following the completion of the test.

Monitoring Wells: The monitoring well and performance well locations are all located either within active agricultural land or within previously disturbed areas. One proposed new monitoring well, MW-RON-1 is located in close proximity to annual grassland habitat that may support vernal wet features.

Dedicated groundwater monitoring wells have been installed over the past years throughout the northern Sacramento Valley to provide data regarding the depths of different aquifers. A total of 10 monitoring wells will be used to evaluate groundwater recharge and recovery. The project has identified 7 proposed monitoring well sites and 3 existing well sites. The proposed monitoring wells cannot be used for the pumping or production of water. Small diameter PVC pipes with perforations at varying depths are placed near a production well and measurements of groundwater depth and quantity are made at different times to assess local groundwater recharge and recovery. Three of the existing monitoring wells will need to be retrofitted with transducers to monitor the groundwater level and temperature data. Once the monitoring project is complete, the newly constructed monitoring wells will be integrated into the cooperative Department of Water Resources-Butte County DW&RC groundwater monitoring network. The location of these monitoring well sites are identified as "MW" on Appendix A. Due to the lack of impacts associated with using existing wells to monitor groundwater, no further biological analysis of these sites is necessary. Where the installation of new monitoring wells is proposed, a 100 foot by 100 foot square area will be identified and a 6 to 8 inch diameter pilot borehole will be drilled up to 1,000 feet deep. The soil cores produced will be analyzed and an elevation and coordinate survey will be conducted at each site. The pilot borehole will then be enlarged to a diameter of 12 to 16 inches to install the groundwater monitoring well. Approximately 35 cubic yards of material/drilling spoils will be produced during installation activities.

Environmental Analysis:

Special-status species are plants and animals that are legally protected under applicable local, state or federal regulations, as well as species considered sufficiently rare by the scientific community to qualify

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for such listing. For the purposes of this study, special-status biological resources, which are protected to varying degrees by local, state and federal regulations, include the following:

Species

- Listed, or proposed or candidates for listing, under the Endangered Species Act (ESA) and/or the California Endangered Species Act (CESA)
- Meet the definitions of rare or endangered pursuant to CEQA
- Listed as rare under the California Native Plant Protection Act
- List 1b and List 2 plants identified by the California Native Plant Society (CNPS)
- Designated as a California Species of Special Concern (SSC) by the DFG
- Fully Protected per California Fish and Game Code (§3511, §4700, §5050, §5515)

Habitats and Communities

- Critical Habitat designated under the Endangered Species Act
- Essential Fish Habitat identified under the Magnuson-Stevens Act
- Sensitive Natural Communities (SNC) identified by the DFG
- Oak Woodlands per CEQA (PRC §21083.4)
- Waters of the US per the federal Clean Water Act

A project would have a potentially significant impact on biological resources if it were to: 1) Have a substantial adverse effect on a plant or animal population, or essential habitat, defined as a candidate, sensitive or special-status species, 2) Have a substantial adverse effect on riparian habitat or other sensitive natural community, 3) Have a substantial adverse effect on federally-protected wetlands as defined by Section 404 of the Clean Water Act, 4) Interfere substantially with the movement of any native resident or migratory fish or wildlife species, their wildlife corridors or nursery sites, or 5) Conflict with an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or any local ordinances or policies protecting biological resources.

a – d). Less Than Significant With Mitigation Incorporated. Due to the potential for special-status biological resources to occur throughout the project area, a Biological Resources Assessment/Biological Assessment (BRA/BA) was prepared for the proposed project (Gallaway Consulting, April 2010). The BRA/BA identifies potentially occurring special-status biological resources within the footprint of each proposed task throughout the broader, two-county project area. The following special-status resources, including individual species as well as habitats and natural communities, have the potential to occur in the project area:

Table 7: Special-Status Biological Resources in the Project Area

<u>Special-Status Resource</u>	Status	
	Federal	State
Habitats/Communities		
Great Valley Cottonwood Riparian Forest	--	SNC
Great Valley Mixed Riparian Forest	--	SNC
Great Valley Valley Oak Riparian Forest	--	SNC
Plants		
Ahart's Dwarf Rush	--	List 1b
Ahart's Paronychia	--	List 1b
Brown Fox Sedge	--	List 2
Butte County Checkerbloom	--	List 1b

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<u>Special-Status Resource</u>	Status	
	Federal	State
Red Bluff Dwarf Rush	--	List 1b
Round-Leaved Filaree	--	List 1b
Invertebrates		
Valley Elderberry Longhorn Beetle	Threatened	--
Reptiles and Amphibians		
Northwestern Pond Turtle	--	SSC
Giant Garter Snake	Threatened	Threatened
Fish		
Central Valley Spring-Run Chinook Salmon	Threatened	Threatened
Central Valley Steelhead	Threatened	--
Hardhead	--	SSC
Birds		
Bald Eagle	Delisted	Endangered
Burrowing Owl	--	SSC
Loggerhead Shrike	--	SSC
Northern Harrier	--	SSC
Peregrine Falcon	Delisted	Fully Protected
Swainson's Hawk	--	Threatened
Yellow Warbler	--	SSC
Mammals		
Townsend's Big-Eared Bat	--	SSC
Western Red Bat	--	SSC

In addition, vegetation throughout the project area could provide nesting sites for a variety of bird species. The federal Migratory Bird Treaty Act (MBTA) protects migratory birds, their occupied nests and eggs. In addition, §3503.5 of the Fish and Game Code prohibits the take of birds in the orders Falconiformes and Strigiformes, commonly referred to as raptors. The proposed project does not require, and will not include, the removal of any trees or shrubs. Thus, no vegetation that provides nesting habitat for these special-status bird species would be removed.

Giant Garter Snake

Monitoring Well Sites MW-RON-1, MW-PIV-1, and MW-PIV-2 are located outside of the species' habitat range. Similarly, the stream reaches and soil infiltration test sites are located outside giant garter snake (GGS) habitat range. The remaining Monitoring Well Sites are located within the GGS habitat range. However, none of the proposed monitoring wells would be located within 200 feet of any potential GGS habitat. Therefore, there would be no potential direct or indirect impacts to GGS generated by the proposed project.

Regional Species and Habitats of Concern

Species that require vernal pool habitat were considered to not have potential to occur within the project areas, since wetland features will be avoided during final siting and installation activities. However, due to the close proximity of vernal features to monitoring well MW-RON-1 and soil infiltration sites SI-DR-2, SI-DR-4, SI-DR-7, and SI-DR-9, minimization measures and best management practices (BMPs) will be incorporated in these areas to ensure no indirect impacts occur to the vernal features or any vernal pool-reliant species. These minimization measures and BMPs will include, but not be limited to, installing orange barrier fencing around all vernal features to prevent access, installing silt fencing and straw wattles

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around all vernal features to prevent runoff or silt from entering the features, and limiting the project equipment installation activities to the smallest practicable area.

Sensitive Natural Communities

Project actions may occur within Sensitive Natural Communities, including Great Valley Cottonwood Riparian Forest, Great Valley Mixed Riparian Forest, and Great Valley Valley Oak Riparian Forest. As mentioned previously, the proposed project would not result in the removal of any trees or shrubs.

List 1b and List 2 Plants

The proposed project would occur in areas occupied by the following List 1b plant species: Ahart's dwarf rush, Ahart's paronychia, Red Bluff dwarf rush, round-leaved filaree, and Butte County checkerbloom. In addition the proposed project would occur in areas occupied by brown fox sedge, a List 2 plant species.

Valley Elderberry Longhorn Beetle:

The valley elderberry longhorn beetle may occur along stream banks and in riparian habitats of the stream reaches. The stream reach actions would not result in the removal of any shrubs or trees. Therefore, there would be no elderberry shrubs removed or damaged during any fieldwork activities.

Northwest Pond Turtle

The Northwest pond turtle may occur along stream reaches within the project area, although no installation activities will occur within or along the banks of the stream reaches. Access to the stream banks may occur near occupied pond turtle nests, if present.

Townsend's Big-Eared Bat and Western Red Bat

No abandoned structures or trees, which constitute suitable Townsend's big-eared bat roosting habitat, will be removed during the project activities. However, this bat species has demonstrated a marked sensitivity to human disturbances. In addition, the proposed project would occur in areas of potential western red bat roosting habitat.

Burrowing Owl

The western burrowing owl may occupy winter burrows and/or nesting burrows, depending on the season, within portions of the project area.

Swainson's Hawk

Swainson's hawk nests in the Central Valley of California are generally found in scattered trees or along riparian systems adjacent to agricultural fields or pastures. They typically soar over open country and agricultural fields in search of prey. Thus, open fields and pastures are the primary foraging areas for this species. Major prey species in the Central Valley include: voles, pocket gophers, deer mice, ground squirrels, mourning doves, pheasants, and meadowlarks as well as a variety of insects. The proposed monitoring well installation activities could occur near occupied Swainson's hawk nests. There would be no trees removed by the proposed project and, due to the locations and limited footprints of the fieldwork tasks, there would be no conversion of Swainson's hawk foraging habitat.

Bald Eagle

Suitable nesting and foraging habitat for the bald eagle is found along the stream reaches within the project site. Thus, the proposed stream reach activities could occur near occupied bald eagle nests.

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Migratory Birds, Raptors, and SSC Species (Loggerhead Shrike, Northern Harrier, Yellow Warbler)

No trees or shrubs would be removed or significantly altered during fieldwork activities. However, occupied nests could be located adjacent to installation sites, which would be subject to temporary noise increases during project activities.

Central Valley Spring-Run Chinook Salmon, Central Valley Steelhead

Typically, adult Central Valley spring-run Chinook salmon begin upstream migration from the ocean around late January to early February. Individuals normally enter the Sacramento River around March to September, with May and June being most prominent. Sexually immature specimens commonly hold in freshwater settings, often up to several months, before spawning. Maturing adults will typically hold in deep pools with cold water.

Central Valley steelhead typically enter fresh water between August and April. Individuals may hold until stream flows are high enough in tributaries to enter for spawning. They normally spawn from December through April. Peak spawning is normally between January and March in the smaller streams with year-round supplies of cool, well-oxygenated water. Incubation can take up to four months, depending on water temperatures.

Activities along Antelope, Mill, Deer, Big Chico and Butte Creeks could involve spawning, rearing and/or migratory habitat for Central Valley spring-run Chinook salmon and Central Valley steelhead.

Due to the presence of the above listed special-status biological resources within the project area, the following mitigation measure shall be implemented:

Mitigation Measure 4.4.1 (Biological Resources)

The proposed fieldwork tasks shall avoid potential impacts to special-status biological resources during all installation tasks, in all areas proposed for fieldwork tasks, and in all access routes to fieldwork areas.

In order to ensure complete avoidance of potential effects to special-status biological resources, a qualified biologist or botanist, as appropriate, shall be present during final siting and initial installation activities for fieldwork tasks.

The qualified biologist shall submit a written report to the Department of Water and Resource Conservation and Development Services providing a brief summary of installation activities with verification that no direct or indirect impacts to sensitive natural communities or plant, wildlife, and fish species and their associated habitat, as described in items 4.4.1.A through 4.4.1.I, occurred during fieldwork.

4.4.1.A (Sensitive Natural Communities)

- A qualified biologist shall be present during final siting and initial installation activities for proposed stream reach tasks and infiltrometer installations.
- Vegetation shall be avoided to the greatest extent feasible.
- All disturbances from piezometer installation activities shall be temporary. Following the completion of the scientific study, all piezometers shall be removed and the disturbed areas shall be re-vegetated, as needed, with similar native vegetation.

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- Relative to this mitigation measure, no further actions are required in any area devoid of designated sensitive natural communities, as identified by the qualified biologist.
- The qualified biologist shall submit a written report to the Departments of Water and Resource Conservation and Development Services providing a brief summary of siting/installation results, verifying that all vegetation has been avoided to the greatest extent feasible, that no trees have been removed, and that no potentially significant impacts to sensitive natural communities were generated.

4.4.1.B (List 1b and List 2 Plant Species)

- The proposed fieldwork tasks shall avoid all occurrences of the following plant species and their suitable habitat, if identified by the qualified biologist within, or in close proximity to, the action areas, or any access routes to said areas:
 - Ahart's dwarf rush
 - Ahart's paronychia
 - Brown fox sedge
 - Butte County checkerbloom
 - Butte County fritillary
 - Red Bluff dwarf rush
 - Round-leaved Filaree
- Activities shall be limited to areas of past disturbances and gravel fill wherever feasible.
- If no special-status plant species or suitable habitat for said species are identified by the qualified biologist, no further actions are required relative to this mitigation measure.
- The qualified biologist shall submit a written report to the Departments of Water and Resource Conservation and Development Services providing a brief summary of installation activities with verification that no direct or indirect impacts to CNPS List 1b or List 2 plants were identified during fieldwork.

4.4.1.C (Valley Elderberry Longhorn Beetle)

- If VELB habitat is identified by the qualified biologist in the area of proposed fieldwork tasks, at a minimum, the following protocol (consistent with those established by the US Fish and Wildlife Service for the protection of VELB) shall be implemented:
 - All elderberry plants shall be avoided to the maximum extent practicable
 - If complete avoidance within 100 feet of elderberry plant is not practicable best management practices shall be incorporated to ensure the avoidance of potential direct impacts, including barrier fencing constructed by erecting 4-foot by 8-foot sections of plywood around the dripline of the elderberry bushes and orange ESA fencing within 100 feet of all other elderberry plants
 - Worker awareness classes describing VELB life history and avoidance measures will be required for all construction workers
- If no VELB habitat is identified by the qualified biologist, no further actions are required relative to this mitigation measure.
- The qualified biologist shall submit a written report to the Departments of Water and Resource Conservation and Development Services providing a brief summary of fieldwork tasks, verifying that no direct or indirect impacts to VELB or VELB habitat have occurred.

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4.4.1.D (Northwest Pond Turtle)

- Any Northwestern pond turtles and northwest pond turtle nests identified by the qualified biologist shall be avoided in all installation areas and all access routes to said areas.
- Any identified northwestern pond turtle nests shall be avoided and access to the stream will be shifted to an adjacent location within the action area where no special-status resources are identified by the qualified biologist.
- The qualified biologist shall submit a written report to the Departments of Water and Resource Conservation and Development Services providing a brief summary of fieldwork tasks, verifying that no direct or indirect impacts to northwest pond turtles have occurred.

4.4.1.E (Townsend's Big-Eared Bat and Western Red Bat)

- Any bat roosts identified by the qualified biologist in fieldwork areas, including access routes to said areas, shall be avoided to the maximum extent practicable.
- If necessary, the installation area(s) shall be shifted to avoid potential impacts to roosts.
- The qualified biologist shall submit a written report to the Departments of Water and Resource Conservation and Development Services providing a brief summary of fieldwork tasks, verifying that no impacts to Townsend's Big-Eared or Western Red Bat roosts have occurred.

4.4.1.F (Western Burrowing Owl)

- Any occupied burrows identified by the qualified biologist in fieldwork areas, including access routes to said areas, shall be avoided with installation sites shifted, as necessary, to avoid active burrows.
- Wintering burrows shall be considered potentially present between December 1 and January 31 and nesting burrows shall be considered potentially present between April 15 and July 15
- If any occupied burrows are identified, avoidance shall be consistent with the *Staff Report on Burrowing Owl Mitigation* (DFG, 1995), as follows:
 - No disturbances shall occur within 50 meters of any occupied burrows.
 - No burrows, whether natural or artificial, shall be damaged or destroyed.
 - No foraging habitat shall be destroyed or degraded within 100 meters of occupied burrows.
- The qualified biologist shall submit a written report to the Departments of Water and Resource Conservation and Development Services providing a brief summary of fieldwork tasks, verifying that no impacts to burrowing owls have occurred.

4.4.1.G (Swainson's Hawk and Bald Eagle)

- Any occupied nests identified by the qualified biologist in the proposed fieldwork areas, including access routes to said fieldwork areas, shall be avoided by moving installation sites, as necessary, to avoid all project-related disturbances.
- Active nests shall be considered potentially present between March 1 and September 15.
- If any occupied nests are identified, avoidance shall be consistent with the *Staff Report regarding Mitigation for Impacts to Swainson's Hawks (Buteo swainsoni) in the Central Valley of California* (DFG, 1994), as follows:
 - No intensive, new disturbances shall occur within one-quarter mile, at a minimum, of any occupied nests.
 - Through consultation with the qualified biologist, the applicant shall ensure that no project-related activities result in nest abandonment, forced fledging or other forms of take.

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- The qualified biologist shall submit a written report to the Departments of Water and Resource Conservation and Development Services providing a brief summary of fieldwork tasks, verifying that no potential impacts to Swainson's hawks or bald eagles have occurred.

4.4.1.H (Nesting Migratory Birds, Raptors, and SSC Bird Species)

- Any occupied nests identified by the qualified biologist in the proposed fieldwork areas, including access routes to said fieldwork areas, shall be avoided by moving installation sites, as necessary, to avoid all project-related disturbances.
- Active nests of raptors, migratory birds, and SSC bird species shall be considered potentially present between March 1 and September 15.
- Through consultation with the qualified biologist, the applicant shall ensure that no project-related activities result in potential impacts, such as nest abandonment or forced fledging.
- The qualified biologist shall submit a written report to the Departments of Water and Resource Conservation and Development Services providing a brief summary of fieldwork tasks, verifying that no potential impacts to nesting raptors, migratory birds or SSC bird species have occurred.

4.4.1.I (Central Valley Spring-Run Chinook Salmon and Central Valley Steelhead)

- All potential direct and indirect impacts to special-status fish species shall be avoided, as determined by the qualified biologist, in all stream reach areas and any access routes to said stream reach areas, by moving installation sites, as necessary.
- All activities within creeks shall be temporary and affect the smallest surface area required for the installation of staff gauges and seepage meter tests.
- Stream reach activities shall avoid spawning habitat, as identified by the qualified biologist.
- Installation activities shall not occur when fish are spawning, during incubation, or before juveniles have emerged, as determined by the qualified biologist.
- The qualified biologist shall submit a written report to the Departments of Water and Resource Conservation and Development Services providing a brief summary of fieldwork tasks, verifying that no direct or indirect impacts to anadromous species, their critical habitat, or essential fish habitat have occurred.

Plan Requirements: These measures shall be included as attachments to any applicable plans, permits and contracts necessary for the installation of corresponding monitoring equipment. The Department of Water and Resource Conservation shall ensure that all field personnel and contractors understand said measures at the time any plans, permits and contracts for fieldwork are finalized and approved.

Timing: Biologist and/or botanist reconnaissance and, if necessary, all resource avoidance shall be implemented prior to any ground-disturbing activities and prior to the installation of any monitoring equipment.

Monitoring: Butte County Department of Development Services and Department of Water and Resource Conservation shall ensure that the above mitigation is incorporated into all applicable plans, contracts, and regulatory permit applications for the proposed project.

e – f) No Impact. The proposed project would not conflict local policies or ordinances protecting biological resources, such as tree preservation policies and ordinances. Similarly, the proposed project would not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community

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Conservation Plan, or any other local, regional, or state habitat conservation plans. Therefore, there would be no impact.

Mitigation: None required

4.5 CULTURAL RESOURCES:

Would the proposal:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?		X		
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?		X		
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?		X		
d) Disturb any human remains, including those interred outside of formal cemeteries?		X		

Setting:

Cultural resources, whether historic, proto-historic or prehistoric, consist of human-made sites, objects, features, or landscapes that define and illuminate our past. Such resources include archaeological sites as well as rock walls, water ditches, flumes, cemeteries, architectural features, and historic districts.

Public Resources Code (PRC) §5020.1 defines historical resources as “historically or archaeologically significant.” The CEQA Guidelines (§15064.5) state that “historically significant” resources are normally those that meet at least one of the four California Register of Historical Resources (California Register) listing criteria, as follows:

- Associated with events that have made a significant contribution to the broad patterns of California’s history and cultural heritage
- Associated with the lives of persons important in our past
- Embodies the distinctive characteristics of a type, period, region, or method of construction represents the work of an important creative individual, or possesses high artistic values
- Has yielded, or may be likely to yield, information important in prehistory or history

Furthermore, PRC §21083.2 defines a unique archaeological resource as “an archaeological artifact, object, or site about which it can be clearly demonstrated that...there is a high probability” the resource meets one of the following criteria: 1) It contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information, 2) It has a special and particular quality such as being the oldest of its type or the best available example of its type, or 3) It is directly associated with a scientifically recognized important prehistoric or historic event or person.

A substantial adverse change to a significant historic resource could involve its demolition or material alteration in such a way that it no longer conveys the historic or cultural significance that justifies its inclusion in the California Register or analogous local registers (CEQA Guidelines §15064.5).

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Environmental Analysis:

Genesis Society, Inc. performed a Class I Archaeological Survey (April 2010) in order to identify any resources that may have been recorded near the proposed action areas that would involve ground disturbances. Thus, the Archaeological Survey, which addresses the monitoring well, infiltration, and stream-aquifer interaction reaches, involved the following tasks:

- Records Search at the Northeast Information Center (NEIC) at CSU, Chico to determine if any previously recorded sites, archaeological districts, features or other cultural resources exist within the study area
- Cursory-level field inspection to identify especially significant resources, or evaluate the area's potential to contain especially significance resources, the presence of which might prohibit, or substantially constrain, one or more of the project components
- Class I Archaeological Report summarizing potential project effects and identifying mitigation commensurate with: 1) the goals of the Initial Study and 2) a finding that implementation of the project components can or might be reduced to less than significant levels

The Records Search identified two previous archaeological surveys in the areas of proposed infiltration testing. These previous surveys cover approximately 5% of the survey area. Four previous archaeological surveys were identified in the areas of proposed monitoring wells, representing approximately 20% of the survey area. Finally, the Records Search identified nine previous archaeological surveys in the stream reaches, representing approximately 15% of the survey area. Based on the Records Search, the following historic and prehistoric site/feature types would be expected to occur in the survey area:

Potential Historic Resources in Study Areas

- Historic homes, commercial buildings and public structures within and around the City of Chico
- Railroads and railroad-related features
- Water distribution and drainage (reclamation) systems, including ditch and canal systems
- Historic homesteads and associated features, including refuse disposals, privies, barns, and sheds
- Ranch features and associated residences, including standing structures, structural remnants, barns, equipment storage buildings, pump houses, irrigation and other features
- Historic transportation corridors and roadways
- Electrical transmission and distribution lines

Potential Prehistoric Resources in Study Areas

- Surface scatters of lithic artifacts and debitage associated with dark brown to black "midden" deposits resulting from village encampments. Typically, such sites are located adjacent or close to perennial water sources
- Surface scatters of lithic artifacts and debitage without associated middens, resulting from short-term occupation and/or specialized economic activities
- Bedrock milling stations, including both mortar holes and metate slicks, located in areas where bedrock is exposed, particularly along stream channels
- Petroglyphs, especially bedrock outcrops containing small "cupules"
- Isolated finds of aboriginal artifacts and flakes

The Archaeological Survey Report identifies the following four broad categories of potential impacts that could be generated: 1) Direct impacts to documented historic or prehistoric sites 2) Direct impacts to previously unidentified historic or prehistoric sites 3) Inadvertent impacts to previously undocumented

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and thus unknown prehistoric or historical cultural resources within the project area 4) Inadvertent impacts to human burials or scattered human remains related to prehistoric occupation of the area.

a – d) Less Than Significant With Mitigation Incorporated. The Class I Archaeological Survey identified historic and prehistoric resources that have been identified in the vicinity proposed field work tasks. Through avoidance of these documented resources, the proposed project would result in no impacts. However, the proposed project could result in potential direct and/or inadvertent impacts to undocumented historic and/or prehistoric resources. Therefore, the following mitigation shall be implemented:

Mitigation Measure 4.5.1 (Cultural Resources)

- All documented historic and prehistoric resources identified during the Class I Archaeological Survey shall be avoided pursuant to applicable regulations (PRC, CEQA Guidelines, et al.).
- A qualified archaeologist shall be present during the final siting and initial installation activities of fieldwork tasks (undertakings) to survey the project area and ensure the avoidance of undocumented cultural resources. The archaeologist's site review shall be conducted for each specific undertaking. The archaeological area of potential effect will be the land area affected by the proposed undertaking.
- If potentially significant resources are identified during the siting of any fieldwork tasks, the proponent, in consultation with a qualified professional archaeologist, shall avoid potential effects through redesign of the applicable task(s).
- If a previously undiscovered historical resource is inadvertently encountered during project activities, all work in the immediate vicinity of the resource (except that necessary to secure and protect the resource) shall cease until the project proponent can secure assistance from a professional archaeologist who will be commissioned to evaluate and, if necessary, mitigate effects to the discovery. Evaluation and mitigation shall be carried out in compliance with CEQA and professional guidelines as expeditiously as possible.

Plan Requirements: This mitigation shall be incorporated with applicable project packages (well permits, logs and completion reports, Project Assessment and Evaluation Plan, right-of-entry forms, drilling contracts, et al.).

Timing: This mitigation shall be implemented during site identification, preparation and facility installation, as applicable.

Monitoring: The Department of Water and Resource Conservation shall ensure that the above mitigation is incorporated into all applicable plans, contracts, and permit packages. In the event cultural resources are discovered, project contractors shall be responsible for notifying the Department of Water and Resource Conservation, the Department of Development Services and a qualified archaeologist. The DDS shall coordinate with the proponent and appropriate authorities to avoid impacts to cultural resources and determine appropriate actions.

While unlikely, currently unidentified human remains can be uncovered during any ground-disturbing activities. Pursuant to California Health and Safety Code (§7050.5), if previously unidentified human remains are unearthed during ground disturbances, all work must cease within 100-feet of the discovery

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and the County Coroner must be notified. No further disturbances may occur until the Coroner, in consultation with the Native American Heritage Commission, makes the necessary findings as to the origins and disposition of the remains pursuant to PRC §5097 and the Native American Graves Protection and Repatriation Act (NAGPRA). Thus, adherence to the applicable local, state and federal regulations ensures less than significant potential impacts to undocumented human remains uncovered during project activities.

All potential effects related to cultural resources would be temporary in nature. There would be no potential impacts to documented resources. Through adherence to the mitigation measures and adherence to all applicable state and federal regulations, as set forth in this document, the proposed project would result in less than significant potential impacts to undocumented cultural resources.

4.6 GEOLOGY AND SOILS:

Would the proposal:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
1. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.				X
2. Strong seismic ground shaking?			X	
3. Seismic-related ground failure, including liquefaction?				X
4. Landslides?				X
b) Result in substantial soil erosion or loss of topsoil?				X
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?				X
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?				X
e) Have Soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal system where sewers are not available for the disposal or waste water?				X

Setting:

The Cleveland Hills Fault Zone is the only Alquist-Priolo zone delineated within Butte County. The Butte County General Plan notes that the entire county is in Earthquake Intensity Zone VIII (Moderate). Depending on site-specific conditions, local intensities could vary from VII to IX (CA Division of Mines and Geology, 1995). Relative to most of the state, Tehama County is exposed to minimal seismic hazards as a result of location. The 1994 Fault Activity Map (California Geological Survey), indicates no active or potentially active faults within Tehama County. Although no active faults are mapped in Tehama County, potential earth shaking events could result from seismic activity outside the county or as a precursor to volcanic activity at Mount Lassen. Other geologic hazards associated with seismic activity, such as

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liquefaction and *seiches*, have a generally low probability of occurring in both counties. Neither county is subject to significant *tsunami* hazards.

An impact related to geologic processes (such as earthquakes, landslides, and liquefaction) can occur when developments or their occupants are significantly affected by these geologic phenomena. In addition, a project may induce a deleterious geologic process. For example, modifications to landforms and slopes may result in erosion or land instabilities. Modifications to surface and sub-surface hydrology can result in subsidence or collapse.

Environmental Analysis:

The proposed monitoring actions would not involve the construction of dwellings or structures. There would be no significant changes to the spatial distribution of humans or structures, particularly as they relate to the existing geologic hazards in Butte and Tehama Counties.

a – d) Less Than Significant. Given the nature of the proposed monitoring actions and the minimal fieldwork involved, the proposal would not expose people or structures to a significant risk of loss, injury, or death involving geologic hazards (fault rupture, seismic ground shaking, ground failure, landslides, liquefaction, subsidence, et cetera).

The limited footprints of the proposed fieldwork and the limited extent and nature of the installation and drilling work would present negligible potentials for soil erosion and loss of topsoil. The proposed wells would be subject to the permitting requirements and BMPs of the County Code, drilling personnel would be required to demonstrate compliance with the licensing requirements of the Business and Professions Code, and all actions would be conducted according the applicable standards of DWR Bulletins 74-81 and 74-90 (Water Well Standards, State of California). Therefore, relative to these Geology and Soils factors, the proposal would result in less than significant potential impacts.

Mitigation: None Required

e) No Impact. There would be no septic systems or wastewater disposal systems associated with the proposed monitoring actions. Thus, there would be no impact.

Mitigation: None Required

4.7 GREENHOUSE GAS EMISSIONS:

Would the proposal:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
<ul style="list-style-type: none"> Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? 			X	
<ul style="list-style-type: none"> Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases? 			X	

Setting:

The state has implemented an emissions reduction program for greenhouse gasses in order to achieve a Year 2020 emissions target. Energy production and fossil fuel consumption emissions are to be reduced through a series of stricter manufacturer standards, incentives and penalties. The costs of many of these

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emissions reducing programs will ultimately be transmitted to the end users (primarily energy consumers and motorists).

Environmental Analysis:

The proposed action would not result in land use changes or developments. The TCAPCD and BCAQMD recommend the consideration of vehicle trips generated when evaluating project-level conflicts with greenhouse gas emissions reduction goals. According to the agencies' CEQA Handbooks, approximately 40% of the state's greenhouse gas emissions are generated by vehicle exhaust. Installation equipment and staff vehicles used to travel between monitoring sites would be the only sources of exhaust emissions.

a – b) Less Than Significant. The emissions of greenhouse gasses generated by the proposal would be temporary and negligible when compared to regional emissions. Furthermore, as identified in the Air Quality Section, the proposed activities would be subject to the applicable Standard Mitigation Measures established by the TCAPCD and BCAQMD, many of which would further reduce the insignificant, temporary greenhouse gas emissions generated by the proposal. Therefore, relative to greenhouse gas emissions, there would be less than significant potential impacts.

Mitigation: None Required

4.8 HAZARDS/HAZARDOUS MATERIALS:

Would the proposal:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Create a significant hazard to the public or the environment through the routine transport use, or disposal of hazardous materials?				X
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?			X	
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed schools?				X
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?			X	
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?				X
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?				X
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?				X
h) Expose people or structures to a significant risk or loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?				X

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Setting:

The US EPA is primarily responsible for the regulation of hazardous waste at the federal level. In addition, the agency oversees the remediation of National Priorities List – or Superfund – sites. Federal laws that address hazardous waste and environmental contamination include the following: Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); Resource Conservation and Recovery Act (RCRA); Clean Air Act (CAA); and Clean Water Act (CWA).

The California EPA (Cal/EPA), which is primarily responsible for the regulation of hazardous waste and materials at the state level, is comprised of Department of Toxic Substances Control (DTSC), State Water Resources Control Board (SWRCB), Regional Water Quality Control Boards (RWQCBs), California Air Resources Board (CARB), and the California Integrated Waste Management Board (CIWMB). In addition, the California Occupational Health and Safety Administration (Cal/OSHA) is responsible for the enforcement of state laws and regulations pertaining to health and safety in the workplace and at contaminated sites. State laws addressing hazardous materials and environmental contamination include Water Code (Division 7 *Water Quality*) and Health & Safety Code (Division 20 *Miscellaneous* and Division 26 *Air Resources*). In addition, the following titles of the California Code of Regulations establish state regulations related to hazardous waste and environmental contamination: Title 8 (Cal/OSHA Regulations), Title 17 (Air Resources), Title 22 (Environmental Health Standards for the Management of Hazardous Waste), Title 23 (State Water Resources Control Board and Regional Water Quality Control Boards), and Title 27 (Solid Waste).

These regulations require emergency response from local agencies to contain hazardous materials. The Butte County Interagency Hazardous Materials Team responds to hazardous materials emergencies in the project area. The Butte County Multi-Jurisdictional All Hazard Pre-Disaster Mitigation Plan was adopted by the Board of Supervisors. Chapter 8 of the County Code establishes a system of coordination between the County Office of Emergency Management and Operational Area Constituents, such as cities and special districts. Similarly, the Tehama County Emergency Management Plan identifies coordination efforts between various responding agencies throughout the county’s jurisdiction. Emergency response and management operates under the Standardized Emergency Management System (SEMS), as required by for response management during multi-agency and multi-jurisdictional emergencies (Government Code §8607).

Environmental Analysis:

According to DTSC, Butte County contains six (6) Military Evaluation, three (3) Federal Superfund, and 25 State Response sites. Seven of the documented sites in Butte County include land-use restrictions related to their history of contamination. In addition, the DTSC has identified eight groundwater plumes of industrial solvents, all of which are located inside or directly adjacent to the City of Chico. There are no actions proposed in the lands overlaying these documented plumes.

Table 8: Butte County Federal Superfund and State Response Sites

Superfund and State Response Sites		
Federal Superfund (Priority)	Status	Restricted
Koppers Industries, Inc. (Yes)	Cert. Operation/Maintenance	Yes
LA Pacific, Oroville (Delisted)	Certified	No
Western Pacific RR Co. (Delisted)	Certified	Yes

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State Response	Status	Restricted
Nor Cal Recycling	Active	No
LA Pacific Corp. Chico	Cert. Operation/Maintenance	Yes
Chico Scrap Metal – South	Active	No
Sierra Pacific Oroville	Backlog	No
Chico Scrap Metal - 20th Street	Active	No
Scott Property	Refer: RWQCB	No
Johnson Property	Refer: RWQCB	No
Rosellini Property	Refer: RWQCB	No
Humboldt Road Burn Dump	Refer: RWQCB	No
Dunn Property	Refer: RWQCB	No
Chico Development Inc.	Refer: RWQCB	No
West Property	Refer: RWQCB	No
Mulkey Property	Refer: RWQCB	No
Esplanade Cleaners	Backlog	No
First Avenue Cleaners	Active	No
Flair Custom Cleaners	Backlog	No
Norge Village Cleaners	Backlog	No
North Valley Plaza Cleaners	Active	No
World Radiator and A.C.	Active	No
Skyway Subdiv. Groundwater Plume	Active	No
Chico SW Groundwater Plume	Active	Yes
Chico Central Groundwater Plume	Active	No
Victor Industries – 20 th Street	Active	Yes
Chico Municipal Airport	Active	Yes
Ophir Road Property	Active	No

Table 9: Butte County Sites with Land-Use Restricted

Site Name	Site Type
LA Pacific Corp. Chico	State Response
Chico SW Groundwater Plume	State Response
Victor Industries – 20 th Street	State Response
Chico Municipal Airport	State Response
Koppers Industries, Oroville	Federal Superfund
Western Pacific RR Co.	Federal Superfund
PG&E, Chico #1	Voluntary Cleanup

Based on DTSC records, five (5) Military Evaluation, two (2) State Response, zero (0) Federal Superfund and zero (0) Land-Use Restricted sites are located within Tehama County.

Table 10: Tehama County State Response Sites

Name	Status	Restricted
Triple R Boys Ranch	Active	No
Sobex Ranch	De-listed	No

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Relative to naturally occurring asbestos (NOA), ultramafic rocks have been mapped in Tehama County, west of Paskenta along the Coast Ranges. Similarly, ultramafic rocks have been mapped in Butte County, east of Paradise and Magalia along the Sierra Nevada. There would be no activities in these areas of potential naturally occurring asbestos.

Proposed MW-RON-1 would be installed on a ±38-acre parcel. The drilling spoils would be dispersed within the western area of the parcel, which is currently disturbed. Proposed MW-PIV-1 and MW-PIV-2 would be installed on approximately 155 acres. The drilling spoils would be dispersed within the site, which consists of existing processing facilities, graded areas and orchards. Proposed MW-CRL-1 and MW-M&T-1 would be installed on the M&T Ranch. The drilling spoils would be dispersed within the site, which consists of existing orchards, processing facilities and graded areas. Proposed MW-CSU-1 would be installed at the CSUC Farm on a parcel measuring approximately 331 acres. The drilling spoils would be dispersed within the site, which consists of existing classroom and processing facilities, graded areas and various orchards, fields, and pastures. Proposed MW-CSU-1 would be installed at the Esquon Ranch on a parcel measuring approximately 273 acres.

If mud rotary drilling is utilized, the mud will be contained with a steel mud basin and recycled throughout the drilling. Formation drill cutting will be removed using a portable sand cone and shaker table. The drilling cuttings will be spread at each site, exclusively within the 100 by 100 foot cleared area, if possible, to protect the monitoring well from surface runoff. A 1,000-foot-deep borehole will yield approximately 35 cubic yards of material (drilling spoils). Under these circumstances, the surplus drilling spoils and water produced during drilling will be incorporated into the remainder of the parcel and utilized within the existing agricultural setting.

a, c, e - h) No Impact. There would be no increased likelihood of the routine transport of toxic materials or substances associated with the proposal. The proposed action would not result in facilities that would generate or emit hazardous materials.

The proposed actions would not block or restrict a designated evacuation route or access to an emergency facility. The County Code and CBC address emergency vehicle access to, and passage through, work sites. Potential emergency response impacts during construction activities would not be significant.

Proposed data acquisition activities and soils infiltration testing would occur approximately seven miles east of the Red Bluff Municipal Airport and approximately one mile north of the Chico Municipal Airport. Due to the nature of the proposal, there would be no potential hazards related to air traffic or airport land use plans.

The proposed actions involve areas identified by California Department of Forestry and Fire Protection (CalFire) as Local Responsibility Areas (LRA) and State Responsibility Areas (SRA). However, due to the nature of the proposed research and data acquisition activities, the project would not involve increased risks of loss, injury or death due to wildfire hazards.

Mitigation: None Required

b, d) Less than Significant. The proposed monitoring and data acquisition activities would be required to avoid disturbances within all hazardous materials sites, as documented per state Government Code (§65962.5).

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Installation activities associated with the project could include refueling and minor onsite maintenance of equipment, which could lead to minor fuel and oil spills. The potential to release hazardous materials into the environment is subject to a variety of federal, state and county laws. The use and handling of hazardous materials during installation activities would be subject to the applicable federal, state, and local laws including California Occupational Health and Safety Administration (CalOSHA) regulations and the County Code.

Therefore, relative to these environmental factors, the proposed project would result in less than significant potential impacts.

Mitigation: None Required

4.9 HYDROLOGY AND WATER QUALITY:

Would the proposal:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Violate any water quality standards or waste discharge requirements?				X
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of preexisting nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?				X
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?				X
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?				X
e) Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?				X
f) Otherwise substantially degrade water quality?				X
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?				X
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?			X	
i) Expose people or structures to a significant risk or loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam?				X
j) Inundation by seiche, tsunami, or mudflow?				X

Setting:

The proposed action is a data acquisition and monitoring project. Some of the proposed monitoring equipment would be installed within 100-year floodplains. While some monitoring sites may be within a 100-year flood hazard area, these sites were chosen because of the need to measure the recharge relationship between stream and aquifer under varying flow conditions.

4.0 INITIAL STUDY CHECKLIST

Environmental Analysis:

The proposal does not involve housing or structures. The pads and well caps associated with the proposed monitoring wells represent a negligible increase in impervious surface area. The proposed actions would not interfere with recharge. Rather, the proposed project would improve upon the existing data collection and monitoring network for groundwater. There would be no new, or increased, groundwater extraction and no extraction infrastructure is proposed. Table 4 in the Project Description provides a summary of the existing irrigation wells that will be used for performance testing.

h) Less than Significant. The proposed monitoring equipment would be installed per all applicable standards, including those established by DWR and the County Code. The proposal would not result in new facilities that would impede or redirect flood flows. Thus, there would be less than significant potential impacts related to this environmental factor.

Mitigation: None Required

a – g, i, j) No Impact. The proposal would neither require nor violate any waste discharge requirements. There would be no alterations to drainage patterns or watercourses. The proposal would not result in significant increases in runoff. The proposed monitoring and data acquisition project would not deplete or interfere with groundwater supplies. The proposed project would not increase risks associated with flooding, levee or dam failure, *seiches*, *tsunami* or mudflows. Relative to these environmental factors, there would be less than significant potential impacts.

Mitigation: None Required

4.10 LAND USE:

Would the proposal:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Physically divide an established community?				X
b) Conflict with an applicable land use plan, policy, or regulations of an agency with jurisdiction over the project (including, but not limited to, the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?				X
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?				X

Setting:

The proposed project would result in the installation of monitoring and data collection equipment within the central portions of Butte and Tehama Counties, to the east of the Sacramento River extending the edge of the foothills. Land uses adjacent to individual project sites, include agricultural activities such as orchards, field crops and grazing land, recreation, open space, single-family residential and agricultural residential. Communities within a three to five mile radius of project activities include Oroville, Durham, Chico, Paradise, Vina, Los Molinos, and Red Bluff.

Environmental Analysis:

The soil infiltration sites and activities that would occur within the stream reaches are located east of State Route 99 (SR 99). With the exception of monitoring well MW-RON-1, which is located east of SR 99, all other proposed monitoring well sites are located between the Sacramento River and SR 99. Communities

4.0 INITIAL STUDY CHECKLIST

in the vicinity of data collection and monitoring sites include: Durham, Chico, and Los Molinos. The nearest communities within approximately three miles of any monitoring or data collection site are the City of Chico and the residential community within Butte Creek Canyon. These sites include: the Big Chico Creek stream reach, Butte Creek stream reach and monitoring wells southwest of Chico. Specific sites include: soil infiltration site SI-DR-6; stream gauges SG-BCC-1U, SG-BCC-1D, SG-BUC-1U, SG-BUC-1D; and monitoring wells MW-CSU-1 and MW-CRL-1. In addition to the stream gauge monitoring, other activities that would occur within the identified stream reaches include the installation of piezometer wells and seepage meter tests.

Preparation of the Draft Butte Regional Habitat Conservation Plan/Natural Community Conservation Plan (HCP/NCCP) began in 2007. The HCP/NCCP is being coordinated by the Butte County Association of Governments (BCAG) on behalf of the Cities of Biggs, Chico, Gridley, Oroville, and the County of Butte. The HCP/NCCP will provide opportunities for comprehensive species, wetlands and ecosystem conservation and contribute to the recovery of endangered species within the plan area, while also providing a more streamlined process for environmental permitting. As of the writing of this initial study, a Draft of the HCP/NCCP has not yet been released. The preparation and approval of the HCP/NCCP is expected to be completed in mid-2010, depending upon the issues that will be addressed and the duration of the State/Federal approval process.

a – c) No Impact. The proposed locations of monitoring and data collection equipment, including monitoring wells are outside of established communities and residential neighborhoods. In addition, the field activities that would be required for the installation of monitoring equipment and drilling of monitoring wells are minor and temporary. The proposed project would not displace or divide an established community.

The proposed project would not conflict with any land use plan, policy, or regulations of Butte or Tehama County or any other applicable responsible agency.

This project would not have impacts on any sensitive biological resources that would require mitigation under the future habitat conservation plan. Section 4.4, Biological Resources, identifies Mitigation Measures that would be implemented as part of this project. These Mitigation Measures meet the requirements of all current applicable regulations and standards for candidate, sensitive or special status species, riparian habitat or other sensitive natural community, wetlands, and migratory fish or wildlife.

Mitigation: None required

4.11 MINERAL RESOURCES:

Would the proposal:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?				X
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?				X

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Setting:

The predominant mineral resources in the region include aggregate and stone resources. Aggregate resources, such as sand and gravel, are used extensively in all types of construction, including residential, commercial, industrial, roads and highways, dams, and bridges. There are generally three categories of rock and aggregate resources in the region: in-channel resources or gravel present in stream channels; off-channel resources or terraces, comprising sands and gravels; and hard-rock operations, comprising consolidated rock materials from higher elevation mountains.

According to the Butte County General Plan 2030 Draft EIR, the State Mining and Geology Board (SMGB) classified two areas as Mineral Resource Zones (MRZ), these are the Martin Marietta Materials Table Mountain Quarry near Oroville and a portion of the M&T Chico Ranch, which was a previously-proposed mining site (2001) located adjacent to Little Chico Creek. In Tehama County, gravel mining activities occur west of SR99.

Environmental Analysis:

As noted in the Project Description above, proposed project activities would consist of minimal ground disturbances. Based on the locations of existing quarry and mining operations, the proposed project would not occur within or limit access to identified mineral resources.

a, b) No Impact. The minimal disturbance involved with the proposed project would not result in either the loss of availability of a known mineral resource that would be of value to the region and the residents of the state or in a locally-important mineral resource recovery site. Proposed monitoring well MW-M&T-1 is located approximately 0.5 miles from the eastern boundary of the M&T MRZ. However, project activities would not limit access to nor result in a loss of known mineral resources.

Mitigation: None required

4.12 NOISE:

Would the proposal result in:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?			X	
b) Exposure of persons to or generation of excessive ground borne vibration or ground borne noise levels?				X
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?				X
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?			X	
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?				X
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?				X

4.0 INITIAL STUDY CHECKLIST

Setting:

As an environmental impact, noise may be defined as unwanted sound that may be a by-product of normal (day-to-day, regular) or atypical (sporadic, unusual) activities. Sound becomes unwanted when it interferes with normal activities, causes physical harm, or has adverse effects on health. Noise is measured on a logarithmic scale of sound pressure level known as a decibel (dB). Noise generally diminishes (attenuates) at a rate of 6.0 dB per doubling of distance for acoustically “hard” sites (dominated by concrete, multiple hard surfaces, lack of vegetation) and 7.5 dB per doubling of distance at “soft” sites (dominated by natural land forms, vegetation, etc.) such as the monitoring sites.

Environmental Analysis:

The Butte County General Plan Noise Element (1977) sets a normally acceptable threshold for residential areas of 60 dB and a conditionally acceptable (e.g., during periods of construction) threshold of 70 dB. The Noise Element of the Tehama County General Plan (2009) establishes noise exposure thresholds for new land uses affected by transportation noise and non-transportation noise, as follows:

Table 11: Tehama County Noise Standards for New Uses

New Land Use	<u>Transportation</u>		<u>Non-Transportation</u>		
	Outdoor	Interior	Outdoor		Interior
			Day	Night	Day/Night
All Residential	60-65	45	50	45	35
Transient Lodging	65	45	55	---	40
Hospitals & Nursing Homes	60	45	50	45	35
Theaters & Auditoriums	---	35	---	---	35
Churches, Schools, Libraries, etc.	60	40	55	---	40
Office Buildings	65	45	55	---	45
Commercial Buildings	65	50	55	---	45
Playgrounds, Parks, etc.	70	---	65	---	---
Industry	65	50	65	65	50

a, d) Less Than Significant Impact. Installation of the 3-foot deep infiltrometer test pits are expected to dug by hand, if access allows, a backhoe will be used. Installation of piezometers would be installed using a hand-auger; however, where the soil is intractable, a roto-hammer or small auger on a limited access mobile rig will be used. The drilling of monitoring wells in rural areas of the Central Valley could exceed 70 dB intermittently. However, such noise would be temporary, in rural locations, distant from occupied residences, and subject to the applicable hours of operation requirements of the General Plan.

Mitigation: None required

b – c, e – f) No Impact. The proposal involves no permanent sources of noise. Proposed data acquisition activities and soils infiltration testing would occur approximately seven miles east of the Red Bluff Municipal Airport and approximately one mile north of the Chico Municipal Airport. Due to the nature of the proposal, there would be no potential effects related to airport noise. There would be no new land uses. Therefore, relative to these factors, there would be no impact.

Mitigation: None required

4.0 INITIAL STUDY CHECKLIST

4.13 POPULATION AND HOUSING:

Would the proposal:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?				X
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?				X
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?				X

Setting:

The proposed project would result in the installation of monitoring and data collection equipment within the central portions of Butte and Tehama Counties, to the east of the Sacramento River extending the edge of the foothills. Land uses adjacent to individual project sites, include agricultural activities such as orchards, field crops and grazing land, recreation, open space, single-family residential and agricultural residential. Communities within a three to five mile radius of project activities include Oroville, Durham, Chico, Paradise, Vina, Los Molinos, and Red Bluff.

The proposed monitoring wells would be installed within the valley area of western Butte County, east of the Sacramento River where groundwater, used for drinking water and irrigation, is drawn from the aquifer. The majority of the data collection equipment would be installed along the eastern edge of the Sacramento Valley, where the Tuscan Formation is exposed at the ground surface.

Environmental Analysis:

The proposed locations of monitoring and data collection equipment, including monitoring wells are outside of established communities and residential neighborhoods. In addition, the field activities that would be required for the installation of monitoring equipment and drilling of monitoring wells are minor and temporary.

a-c) No Impact. There would be no homes, businesses, or structures, which could induce population growth. Similarly, the proposal would not result in the extinction of roads or infrastructure, which could indirectly induce population growth. There would be no people displaced and no need for replacement housing. Therefore, relative to population and housing, there would be no impact.

Mitigation: None required

4.14 PUBLIC SERVICES:

Would the proposal: Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services?	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Fire protection?				X
b) Police Protection?				X
c) Schools?				X

4.0 INITIAL STUDY CHECKLIST

Would the proposal: Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services?	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
d) Parks?				X
e) Other public services?				X

Setting:

Fire protection in Tehama County is provided by local districts, local volunteer fire departments, the cities of Red Bluff and Corning, the California Department of Forestry and Fire Protection (CAL-FIRE) and the U.S. Forest Service. Fire agencies have mutual aid agreements to assist each other in handling fire and other emergency calls. The Tehama County Sheriff's Office provides police protection services in the unincorporated areas of the county. The California Highway Patrol, which maintains an office in Red Bluff, provides protection services along the State Routes and major roadways.

The Butte County Fire Department (BCFD) and CAL-FIRE provide fire and emergency services in the unincorporated territory of approximately 1,600 square miles. The incorporated cities and the El Medio Fire Protection District provide services in their respective service areas. Police protection services in Butte County are provided by the Butte County Sheriff's Office and California Highway Patrol in addition to the police agencies in the various incorporated cities.

Environmental Analysis:

The proposal would result in potentially significant impacts if it were to create substantial adverse physical impacts associated with the provision of public services. Such impacts could be the result of new or physically altered governmental facilities, or creating the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts. In addition, an impact could be generated through non-compliance with adopted service ratios, response times, or other performance objectives established for the applicable public service.

a – e) No Impact. The proposed project is a series of data acquisition and groundwater monitoring actions. There would be no increased demands on these public services. Similarly, there would be no need to expand or alter facilities needed for the delivery of these services. Finally, there would be no impacts to response times, service ratios, or other adopted public service performance objectives.

Mitigation: None required

4.15 RECREATION:

Would the proposal:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?				X
b) Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?				X

4.0 INITIAL STUDY CHECKLIST

Setting:

Tehama County Parks and Recreation Department (TCPRD) is primarily responsible for the provision and maintenance of recreation facilities and services in the county. The district owns and maintains nine parks and two public access areas, which are maintained by County Parks and Recreation staff.

Recreation services and facilities in Butte County are provided by Chico Area Recreation and Park District, Feather River Recreation and Park District, Paradise Recreation and Park District, Durham Recreation and Park District, and Richvale Recreation and Park District.

Environmental Analysis:

Relative to recreation, the proposal could have a potentially significant impact if it would increase the use of parks or recreational facilities or if it were to propose the construction or expansion of recreational facilities.

a, c) No Impact. As there would be no developments or land use changes, the proposed data acquisition and monitoring actions would have no effect on recreational facilities. Therefore, relative to this environmental factor, there would be no impact.

Mitigation: None required

4.16 TRAFFIC/TRANSPORTATION:

Would the proposal:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways, freeways, pedestrian and bicycle paths, and mass transit?				X
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?				X
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?				X
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?				X
e) Result in inadequate emergency access?				X
f) Conflict with accepted policies, plans or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?				X

Setting:

Approximately 1,000 total miles and 2,100 lane miles of streets and roads are under county and city jurisdictions within Tehama County. An estimated 46,548 motor vehicles, traveling an average of 2,389,600 vehicle miles daily, use public roads in the county. Butte County roadways include over 2,000

4.0 INITIAL STUDY CHECKLIST

miles of public roads. Butte County roadways carry approximately 1.7 billion miles of travel demand annually (Caltrans California Motor Vehicle Travel Forecast, 2000).

State highways in the project area are under Caltrans jurisdiction and Interstate 5 in Tehama County is part of the National Highway System.

Environmental Analysis:

Relative to CEQA, the proposal would result in potentially significant impacts if it would result in: 1) An increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system, 2) Substantially increase hazards due to a design feature, 3) Result in inadequate emergency access, 4) Conflict with adopted policies, plans, or programs supporting alternative transportation, or 5) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.

a – f) No Impact. The proposed project does not create any new demand for any mode of transportation services. The proposal would not increase traffic volumes or significantly alter existing trip distributions within the action area. The project would involve the installation of scientific data collection equipment and groundwater monitoring wells and would not result in inadequate emergency access. There would be no increased hazards related to design features or incompatible uses. The proposal would not conflict with any alternative transportation or congestion management plans. Finally, there would be no effects on air traffic or air traffic patterns.

Mitigation: None required

4.17 UTILITIES AND SERVICE SYSTEMS:

Would the proposal:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?				X
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				X
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				X
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?				x
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?				X
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?				X
g) Comply with federal, state, and local statutes, and regulations related to solid waste?				X

4.0 INITIAL STUDY CHECKLIST

Setting:

Although the Cities of Corning and Red Bluff operate municipal domestic water systems, most of Tehama County is served by small community water systems and individual wells. Butte County is served a variety of water service providers, including several special districts and municipal systems in the incorporated territories.

Domestic wastewater is generated by toilets, sinks, showers, garbage disposals, dishwashers, washing machines, and similar facilities. Wastewater service in the project area is provided by public sewer systems and individual, on-site treatment and dispersal systems. Public systems include both municipal systems and community systems.

Solid waste management in Tehama and Butte Counties include a primary landfill (Tehama County and Neal Road Landfills, respectively) and several transfer stations. Tehama County has implemented an extensive waste stream diversion program (incorporating recycling and composting programs), and Butte County has implemented the Countywide Integrated Waste Management Plan, as mandated by state law under AB939.

Environmental Analysis:

a – g) No Impact. Due to the nature of the proposed project, there would be no new sources of wastewater or storm water runoff. Thus, there would be no potential impacts related to treatment requirements or capacities. There would be no increased demands on potable water and no impacts related to existing entitlements or commitments. The proposed project would have no effect on landfills or statutes and regulations pertaining to solid waste.

Relative to utilities and service systems, the proposed project would result in no impact.

Mitigation: None required

5.0 MANDATORY FINDINGS OF SIGNIFICANCE (SECTION 15065):

5.0 MANDATORY FINDINGS OF SIGNIFICANCE (SECTION 15065):

Would the proposal:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?		X		
b) Have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects and the effects of probable future projects)?				X
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, directly or indirectly?				X

a) Less Than Significant Impact with Mitigation Incorporated. The proposed project includes five fieldwork-oriented tasks including the installation of infiltrometers, stream gauges, piezometer wells, seepage meter testing, and monitoring well installation. These tasks would involve minor site clearance and digging to install data collection and monitoring equipment. While air quality impacts are expected to be minor due to small areas disturbed and the temporary nature of the project, Mitigation Measure 4.3.1 requires implementation of all applicable Mitigation Measures for equipment exhaust and fugitive dust.

The proposed fieldwork tasks shall avoid potential impacts to special-status biological resources during all installation tasks, in all areas proposed for fieldwork tasks, and in all access routes to fieldwork areas. In order to ensure complete avoidance of potential effects to special-status biological resources, a qualified biologist or botanist, as appropriate, shall be present during final siting and initial installation activities for fieldwork tasks. The qualified biologist shall submit a written report to the Department of Water and Resource Conservation and Development Services providing a brief summary of installation activities with verification that no direct or indirect impacts to sensitive natural communities or plant, wildlife, and fish species and their associated habitat, as described in items 4.4.1.A through 4.4.1.J, occurred during fieldwork.

Mitigation Measure 4.5.1 ensures the avoidance of newly discovered cultural resources that may be encountered during the siting of fieldwork tasks or during ground-disturbing activities.

b) No Impact. Given the temporary and limited extent of the proposed activities, no cumulatively considerable impacts would be generated. As stated in the Project Description, data generated by the proposed project will assist in understanding the Lower Tuscan's ability to recharge and recover from withdrawals of groundwater. The project does not involve the installation of production wells, groundwater pumping or the export of any water whatsoever. No individually limited but cumulatively considerable impacts would result from this research-oriented project.

c) No Impact. This Initial Study Checklist and corresponding analysis evaluates potential impacts associated with the fieldwork components of the proposed project. The proposed field work tasks would be limited in area and temporary nature. The proposed project is not expected to have either direct or indirect environmental impacts that could cause substantial adverse effects upon humans.

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6.0 ENVIRONMENTAL REFERENCE MATERIAL

6.0 ENVIRONMENTAL REFERENCE MATERIAL:

Butte County. 2010. General Plan 2030 Settings and Trends Report. Updated April 8, 2010. <http://www.buttegeneralplan.net/products/SettingandTrends/default.asp>

Butte County. January 24, 2006. Four County Memorandum of Understanding. August 4, 2008. http://www.buttecounty.net/waterandresource/4_county_dw.htm

Camp, Dresser & McKee. "Draft Needs Assessment Tuscan Aquifer Monitoring, Recharge, and Data Management Project." June 15, 2007. August 4, 2008. http://www.buttecounty.net/waterandresource/prop_50.htm

Camp, Dresser & McKee. 2004. Butte County Integrated Water Resources Plan. August 4, 2008. http://www.buttecounty.net/waterandresource/int_water_res_plan.htm

Camp, Dresser & McKee. March 30, 2001. Butte County Water Inventory and Analysis. August 4, 2008. <http://www.buttecounty.net/waterandresource/IA.htm>

Department of Water Resources, et. al. December 2, 2002. "Short-Term Agreement to Guide Implementation of Short-Term Water Management Actions to Meet Local Water Supply Needs and to Make Water Available to the SWP and CVP to Assit in Meeting the Requirements of the 1995 Water Quality Control Plan and to Resolbve Phase 8 Issues." August 4, 2008. <http://www.svwmp.water.ca.gov/>

Department of Water Resources Planning Division. 2005. "California Water Plan Update 2005." August 4, 2008. <http://www.waterplan.water.ca.gov/previous/cwpu2005/index.cfm>

Dudley, Toccoy and Allan Fulton. "Conjunctive Water Management: What Is It? Why Consider It? What Are The Challenges?" 2005. August 4, 2008. http://www.buttecounty.net/waterandresource/uc_extension.htm

Fulton, Allan, Dudley, Toccoy and Kelly Staton. "Possible Approaches to Groundwater Management in the Northern Sacramento Valley." 2004. August 4, 2008. http://www.buttecounty.net/waterandresource/uc_extension.htm

Fulton et. al. 2004. "Seeking an Understanding of the Groundwater Aquifer Systems in The Northern Sacramento Valley." August 4, 2008. http://www.buttecounty.net/waterandresource/uc_extension.htm

Harwood, D.S. and E.J. Helley. 1987. "Late Cenozoic Tectonism of the Sacramento Valley." United States Geological Survey.

Northern California Water Association. "Final Sacramento Valley Integrated Water Management Plan." December 5, 2006. August 3, 2008. http://www.norcalwater.org/int_program/irwmp.shtml

Tehama County. 2008. General Plan Draft Environmental Impact Report, 2008-2028. <http://www.tehamagp.com/html/documents.html>

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7.0 MITIGATION MEASURES AND MONITORING REQUIREMENTS

7.0 MITIGATION MEASURES AND MONITORING REQUIREMENTS:

Pursuant to CEQA (PRC §21083 and §21087) “mitigation” includes measures that:

- Avoid the impact altogether by not taking a certain action or parts of an action
- Minimize impacts by limiting the degree or magnitude of the action and its implementation
- Rectify the impact by repairing, rehabilitating, or restoring the impacted environment
- Reduce or eliminate the impact over time by preservation and maintenance operations during the life of the project
- Compensate for the impact by replacing or providing substitute resources or environments

Mitigation measures developed for this project serve to either avoid or minimize any impacts to the environment to a less-than-significant level.

Mitigation Measure 4.3.1 (Air Quality)

To minimize fugitive dust, particulate matter and exhaust emissions during drilling and installation activities and ensure enforcement of policies pertaining to air quality, the following measures, to the extent they are applicable and practicable, shall be included in all plans and contracts for the project:

Fugitive Dust

- Water shall be applied as needed prior to any clearing or earth movement to minimize dust
- On-site vehicles limited to a speed which minimizes dust emissions on unpaved roads
- All visibly dry disturbed soil surface areas of operation shall be watered to minimize dust
- Existing roads and streets adjacent to the project will be cleaned as warranted
- Vehicles entering or exiting unpaved work areas shall travel at a speed which minimizes dust
- Workers shall park in designated parking areas(s) to help reduce dust
- Spoils/soil piles shall be moistened if dust is being emitted from the pile(s). Adequately secured tarps, plastic or other material may be required to further reduce dust

Equipment Exhaust

- Equipment shall be maintained in good repair and proper tune according to the manufacturer’s specifications
- Unnecessary vehicle idling shall be restricted to a maximum of 5 minutes; Equipment and vehicles shall be turned off when not in use
- To the extent feasible, maximize the use of reformulated and emulsified fuels, catalyst and filtration technologies, and diesel equipment meeting CARB’s 1996 or newer certification standard for off-road heavy-duty diesel engines

Plan Requirements: Measures, to the extent they are applicable and practicable, shall be included in all applicable plans and documents for the project.

Timing: Inclusion of measures in applicable plans and contracts to occur prior to installation of corresponding monitoring equipment. Implementation of applicable measures shall occur during installation of monitoring equipment.

Monitoring: Butte County Department of Development Services and Department of Water and Resource Conservation shall ensure the inclusion of applicable measures in plans and work contracts.

7.0 MITIGATION MEASURES AND MONITORING REQUIREMENTS

Mitigation Measure 4.4.1 (Biological Resources)

The proposed fieldwork tasks shall avoid potential impacts to special-status biological resources during all installation tasks, in all areas proposed for fieldwork tasks, and in all access routes to fieldwork areas.

In order to ensure complete avoidance of potential effects to special-status biological resources, a qualified biologist or botanist, as appropriate, shall be present during final siting and initial installation activities for fieldwork tasks.

The qualified biologist shall submit a written report to the Department of Water and Resource Conservation and Development Services providing a brief summary of installation activities with verification that no direct or indirect impacts to sensitive natural communities or plant, wildlife, and fish species and their associated habitat, as described in items 4.4.1.A through 4.4.1.I, occurred during fieldwork.

4.4.1.A (Sensitive Natural Communities)

- A qualified biologist shall be present during final siting and initial installation activities for proposed stream reach tasks and infiltrometer installations.
- Vegetation shall be avoided to the greatest extent feasible.
- All disturbances from piezometer installation activities shall be temporary. Following the completion of the scientific study, all piezometers shall be removed and the disturbed areas shall be re-vegetated, as needed, with similar native vegetation.
- Relative to this mitigation measure, no further actions are required in any area devoid of designated sensitive natural communities, as identified by the qualified biologist.
- The qualified biologist shall submit a written report to the Departments of Water and Resource Conservation and Development Services providing a brief summary of siting/installation results, verifying that all vegetation has been avoided to the greatest extent feasible, that no trees have been removed, and that no potentially significant impacts to sensitive natural communities were generated.

4.4.1.B (List 1b and List 2 Plant Species)

- The proposed fieldwork tasks shall avoid all occurrences of the following plant species and their suitable habitat, if identified by the qualified biologist within, or in close proximity to, the action areas, or any access routes to said areas:
 - Ahart's dwarf rush
 - Ahart's paronychia
 - Brown fox sedge
 - Butte County checkerbloom
 - Butte County fritillary
 - Red Bluff dwarf rush
 - Round-leaved Filaree
- Activities shall be limited to areas of past disturbances and gravel fill wherever feasible.
- If no special-status plant species or suitable habitat for said species are identified by the qualified biologist, no further actions are required relative to this mitigation measure.
- The qualified biologist shall submit a written report to the Departments of Water and Resource Conservation and Development Services providing a brief summary of installation activities with

7.0 MITIGATION MEASURES AND MONITORING REQUIREMENTS

verification that no direct or indirect impacts to CNPS List 1b or List 2 plants were identified during fieldwork.

4.4.1.C (Valley Elderberry Longhorn Beetle)

- If VELB habitat is identified by the qualified biologist in the area of proposed fieldwork tasks, at a minimum, the following protocol (consistent with those established by the US Fish and Wildlife Service for the protection of VELB) shall be implemented:
 - All elderberry plants shall be avoided to the maximum extent practicable
 - If complete avoidance within 100 feet of elderberry plant is not practicable best management practices shall be incorporated to ensure the avoidance of potential direct impacts, including barrier fencing constructed by erecting 4-foot by 8-foot sections of plywood around the dripline of the elderberry bushes and orange ESA fencing within 100 feet of all other elderberry plants
 - Worker awareness classes describing VELB life history and avoidance measures will be required for all construction workers
- If no VELB habitat is identified by the qualified biologist, no further actions are required relative to this mitigation measure.
- The qualified biologist shall submit a written report to the Departments of Water and Resource Conservation and Development Services providing a brief summary of fieldwork tasks, verifying that no direct or indirect impacts to VELB or VELB habitat have occurred.

4.4.1.D (Northwest Pond Turtle)

- Any Northwestern pond turtles and northwest pond turtle nests identified by the qualified biologist shall be avoided in all installation areas and all access routes to said areas.
- Any identified northwestern pond turtle nests shall be avoided and access to the stream will be shifted to an adjacent location within the action area where no special-status resources are identified by the qualified biologist.
- The qualified biologist shall submit a written report to the Departments of Water and Resource Conservation and Development Services providing a brief summary of fieldwork tasks, verifying that no direct or indirect impacts to northwest pond turtles have occurred.

4.4.1.E (Townsend's Big-Eared Bat and Western Red Bat)

- Any bat roosts identified by the qualified biologist in fieldwork areas, including access routes to said areas, shall be avoided to the maximum extent practicable.
- If necessary, the installation area(s) shall be shifted to avoid potential impacts to roosts.
- The qualified biologist shall submit a written report to the Departments of Water and Resource Conservation and Development Services providing a brief summary of fieldwork tasks, verifying that no impacts to Townsend's Big-Eared or Western Red Bat roosts have occurred.

4.4.1.F (Western Burrowing Owl)

- Any occupied burrows identified by the qualified biologist in fieldwork areas, including access routes to said areas, shall be avoided with installation sites shifted, as necessary, to avoid active burrows.
- Wintering burrows shall be considered potentially present between December 1 and January 31 and nesting burrows shall be considered potentially present between April 15 and July 15
- If any occupied burrows are identified, avoidance shall be consistent with the *Staff Report on Burrowing Owl Mitigation* (DFG, 1995), as follows:

7.0 MITIGATION MEASURES AND MONITORING REQUIREMENTS

- No disturbances shall occur within 50 meters of any occupied burrows.
- No burrows, whether natural or artificial, shall be damaged or destroyed.
- No foraging habitat shall be destroyed or degraded within 100 meters of occupied burrows.
- The qualified biologist shall submit a written report to the Departments of Water and Resource Conservation and Development Services providing a brief summary of fieldwork tasks, verifying that no impacts to burrowing owls have occurred.

4.4.1.G (Swainson's Hawk and Bald Eagle)

- Any occupied nests identified by the qualified biologist in the proposed fieldwork areas, including access routes to said fieldwork areas, shall be avoided by moving installation sites, as necessary, to avoid all project-related disturbances.
- Active nests shall be considered potentially present between March 1 and September 15.
- If any occupied nests are identified, avoidance shall be consistent with the *Staff Report regarding Mitigation for Impacts to Swainson's Hawks (Buteo swainsoni) in the Central Valley of California* (DFG, 1994), as follows:
 - No intensive, new disturbances shall occur within one-quarter mile, at a minimum, of any occupied nests.
 - Through consultation with the qualified biologist, the applicant shall ensure that no project-related activities result in nest abandonment, forced fledging or other forms of take.
- The qualified biologist shall submit a written report to the Departments of Water and Resource Conservation and Development Services providing a brief summary of fieldwork tasks, verifying that no potential impacts to Swainson's hawks or bald eagles have occurred.

4.4.1.H (Nesting Migratory Birds, Raptors, and SSC Bird Species)

- Any occupied nests identified by the qualified biologist in the proposed fieldwork areas, including access routes to said fieldwork areas, shall be avoided by moving installation sites, as necessary, to avoid all project-related disturbances.
- Active nests of raptors, migratory birds, and SSC bird species shall be considered potentially present between March 1 and September 15.
- Through consultation with the qualified biologist, the applicant shall ensure that no project-related activities result in potential impacts, such as nest abandonment or forced fledging.
- The qualified biologist shall submit a written report to the Departments of Water and Resource Conservation and Development Services providing a brief summary of fieldwork tasks, verifying that no potential impacts to nesting raptors, migratory birds or SSC bird species have occurred.

4.4.1.I (Central Valley Spring-Run Chinook Salmon and Central Valley Steelhead)

- All potential direct and indirect impacts to special-status fish species shall be avoided, as determined by the qualified biologist, in all stream reach areas and any access routes to said stream reach areas, by moving installation sites, as necessary.
- All activities within creeks shall be temporary and affect the smallest surface area required for the installation of staff gauges and seepage meter tests.
- Stream reach activities shall avoid spawning habitat, as identified by the qualified biologist.
- Installation activities shall not occur when fish are spawning, during incubation, or before juveniles have emerged, as determined by the qualified biologist.
- The qualified biologist shall submit a written report to the Departments of Water and Resource Conservation and Development Services providing a brief summary of fieldwork tasks, verifying

7.0 MITIGATION MEASURES AND MONITORING REQUIREMENTS

that no direct or indirect impacts to anadromous species, their critical habitat, or essential fish habitat have occurred.

Plan Requirements: These measures shall be included as attachments to any applicable plans, permits and contracts necessary for the installation of corresponding monitoring equipment. The Department of Water and Resource Conservation shall ensure that all field personnel and contractors understand said measures at the time any plans, permits and contracts for fieldwork are finalized and approved.

Timing: Biologist and/or botanist reconnaissance and, if necessary, all resource avoidance shall be implemented prior to any ground-disturbing activities and prior to the installation of any monitoring equipment.

Monitoring: Butte County Department of Development Services and Department of Water and Resource Conservation shall ensure that the above mitigation is incorporated into all applicable plans, contracts, and regulatory permit applications for the proposed project.

Mitigation Measure 4.5.1 (Cultural Resources)

- All documented historic and prehistoric resources identified during the Class I Archaeological Survey shall be avoided pursuant to applicable regulations (PRC, CEQA Guidelines, et al.).
- A qualified archaeologist shall be present during the final siting and initial installation activities of fieldwork tasks (undertakings) to survey the project area and ensure the avoidance of undocumented cultural resources. The archaeologist's site review shall be conducted for each specific undertaking. The archaeological area of potential effect will be the land area affected by the proposed undertaking.
- If potentially significant resources are identified during the siting of any fieldwork tasks, the proponent, in consultation with a qualified professional archaeologist, shall avoid potential effects through redesign of the applicable task(s).
- If a previously undiscovered historical resource is inadvertently encountered during project activities, all work in the immediate vicinity of the resource (except that necessary to secure and protect the resource) shall cease until the project proponent can secure assistance from a professional archaeologist who will be commissioned to evaluate and, if necessary, mitigate effects to the discovery. Evaluation and mitigation shall be carried out in compliance with CEQA and professional guidelines as expeditiously as possible.

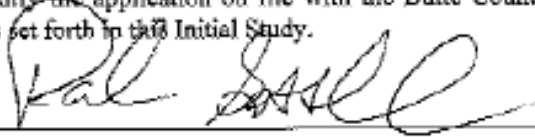
Plan Requirements: This mitigation shall be incorporated with applicable project packages (well permits, logs and completion reports, Project Assessment and Evaluation Plan, right-of-entry forms, drilling contracts, et al.).

Timing: This mitigation shall be implemented during site identification, preparation and facility installation, as applicable.

Monitoring: The Department of Water and Resource Conservation shall ensure that the above mitigation is incorporated into all applicable plans, contracts, and permit packages. In the event cultural resources are discovered, project contractors shall be responsible for notifying the Department of Water and Resource Conservation, the Department of Development Services and a qualified archaeologist. The DDS shall coordinate with the proponent and appropriate authorities to avoid impacts to cultural resources and determine appropriate actions.

8.0 PROJECT SPONSOR(S) INCORPORATION OF MITIGATION INTO PROPOSED PROJECT:

I/We have reviewed the Initial Study for the Proposition 50 Tuscan Aquifer Monitoring, Recharge, and Data Management Project (CEQA08-0002) application and particularly the mitigation measures identified herein. I/We hereby modify the application on file with the Butte County Planning Department to include and incorporate all mitigations set forth in this Initial Study.

 5/7/10

Paul Gosselin, Director
Butte County Department of Water
And Resource Conservation
Project Sponsor

Date

Project Sponsor

Date

9.0 CONSULTED AGENCIES:

- | | | |
|---|---|---|
| <input checked="" type="checkbox"/> Environmental Health | <input checked="" type="checkbox"/> Public Works | <input type="checkbox"/> Building Manager |
| <input type="checkbox"/> BCAG | <input type="checkbox"/> ALUC | <input checked="" type="checkbox"/> City of Chico |
| <input checked="" type="checkbox"/> Air Quality Management | <input type="checkbox"/> Department of Conservation | <input type="checkbox"/> City of Oroville |
| <input type="checkbox"/> City of Gridley | <input type="checkbox"/> CalTrans (Traffic) | <input type="checkbox"/> LAFCo |
| <input type="checkbox"/> CA Department of Forestry | <input checked="" type="checkbox"/> Dept. of Fish and Game | <input type="checkbox"/> City of Biggs |
| <input checked="" type="checkbox"/> Army Corps of Engineers | <input checked="" type="checkbox"/> National Marine Fisheries Service | <input type="checkbox"/> Town of Paradise |
| <input checked="" type="checkbox"/> CV Regional Water Quality | <input checked="" type="checkbox"/> US Fish & Wildlife Service | <input type="checkbox"/> Highway Patrol |