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# LAKE TAHOE BASIN SPECIAL FRAMEWORK GROUNDWATER STUDY

## INTERIM STUDY UPDATE

May 2002

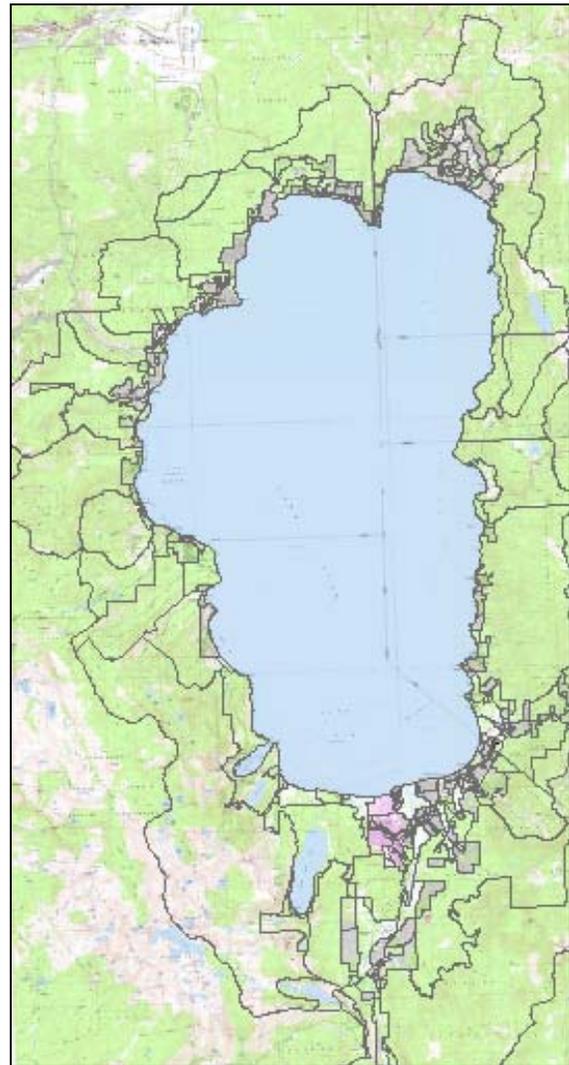
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**Summary:** The Lake Tahoe Basin Special Framework Groundwater Study being conducted by the U.S. Army Corps of Engineers is well underway. Significant progress has been achieved with data collection and compilation, and GIS development. Early evaluation indicates that only broad analysis of nutrient loading can be performed in many areas of the basin where data is not as readily available. South Lake Tahoe has the most complete set of available data. No data interpretation has occurred yet as a more complete data set is required.

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**Background:** The U.S. Army Corps of Engineers is conducting a Lake Tahoe Basin Special Framework Groundwater Study. The study will be conducted through March 2003. The goal of the study is to estimate nutrient loading (nitrogen and phosphorus) to Lake Tahoe via groundwater, determine known and potential nutrient sources, and recommend potential nutrient reduction alternatives. This information will be used by the Corps to determine potential projects that could be executed to reduce the nutrient loading to the lake from groundwater, by Tahoe Regional Planning Agency (TRPA) to meet its management goals and by the Lahontan Regional Water Quality Control Board to determine Total Maximum Daily Loads (TMDLs). This study will increase our understanding of nutrient cycling in the basin and provide revised estimates of nutrient contributions through the groundwater system that are a component of the eutrophication processes reducing lake clarity.

**Literature Search/Data Collection:** The project has been initiated with a literature search and data collection effort. The study is being conducted strictly using existing data. Data is being collected from Federal, state and local agencies who have done



Lake Tahoe Basin with Watershed Boundaries

work in the basin. Two attachments are included to identify the literature and data sources that are being pursued or have already been obtained.

The first attachment contains a list of literature that pertains to the Lake Tahoe Basin. There are notations indicating which have already been received. The list is comprehensive and does not imply that a copy of each will be pursued. As the literature is reviewed, the applicability to the various subject areas will be determined and annotated. Other information such as source, individuals receiving, and data obtained will be included as well.

The second attachment contains a list of data that has already been obtained or requested. At this time, the list does not identify data that will be requested in the future. This data is being collected in electronic version where possible and hard copy if necessary.

Many other agencies in the Tahoe Basin have been contacted to determine all possible sources of data. A contact report has been prepared for each agency contacted and a master contact sheet has been developed. This list also includes agencies that were contacted, but do not have any applicable data. If no data is applicable, an annotation is included to indicate this.

All the data collected is being entered into a database. Duplicate wells are being identified to combine the most accurate information into a single site description.

**GIS:** Data has been collected from multiple agencies including TRPA, U.S. Geological Survey (USGS), Desert Research Institute (DRI) and California Department of Water Resources (California DWR). These files, particularly the digital orthoquadrangles (DOQ), have been used as base maps for our project. Coverages of wells are being created in the Tahoe Basin. Coordination with the TMDL team will ensure consistency with the land use designations chosen for the TMDL study and break down the land use designations into more detail, where necessary. An attempt is being made to obtain a GIS coverage for historic aerial photos from the late 1960's. These will be used to identify large areas of housing where septic tanks would have been in use.

**Data Interpretation:** No data interpretation has been done to date. The first step will be to develop regional groundwater flow and average depth to groundwater. This is the highest priority, as Camp Dresser & McKee (CDM) will use it in the sewer risk evaluation study.

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**Risks and Assumptions Reevaluation:** Assumptions were made when developing the scope of the groundwater study effort. These assumptions are listed with a statement regarding the validity of those assumptions.

<b>Assumption</b>	<b>Reevaluation</b>
Stakeholders already have existing well and nutrient concentration data compiled into either a database or spreadsheet format. Most of the data compilation effort for this study is assumed to be gathering the various stakeholders' information into a uniform system.	It has been determined that this varies by agency. So far, the data that has been identified has been partially electronic and partially in hard copy format.
The data needed to complete the study as scoped exists and are accessible.	There is a lot of data available in the South Lake Tahoe area; however, the data in the other parts of the basin is not as complete. Most of the data is accessible, however there is some reluctance on the part of some agencies to provide data.
Available data is manageable.	So far, the data collected is manageable. Some data is difficult to read.
A GIS system has been developed with basic information such as topographic maps of Lake Tahoe, orthophotographs, county boundaries, watershed boundaries, etc.	Layers for the listed features have been located and downloaded for use by the groundwater study team.
The information collected can be added to the current GIS as additional layers.	This assumption assumed the GIS would be contained somewhere other than the Corps. This is not true, but has not proven to be a problem. The layers that are being created can be added to the layers downloaded as base map features from other agencies.
There is a potential groundwater problem; the extent of the problem being unknown at this time.	This assumption is still valid.

Risks were projected when developing the scope of this effort. These risks are listed with a statement regarding the validity.

<b>Risk</b>	<b>Reevaluation</b>
There is a risk that enough data gaps will exist that only extremely broad evaluations can be achieved.	This risk cannot be thoroughly evaluated, but it appears that this risk may be applicable to all but the South Lake Tahoe area.
There is also a risk that the format of the data collected will not be fully compatible with the Tahoe Integrated Information Management System (TIIMS).	The data will be presented in Microsoft Access format. This appears to be compatible with TIIMS.

<b>Risk</b>	<b>Reevaluation</b>
If there is no established GIS system, there is a risk that unanticipated effort (data input, database management, etc.) will be required to adequately establish this system to meet the data presentation needs. This extra effort could require additional time, funding or change in scope.	Most of the base maps have been established for Tahoe, with the exception of land use classifications. This effort will be handled as a team effort with the rest of the TMDL team. At this time, it does not appear that this will be a true risk.
There is a risk that data available are so extensive that additional time and funding will be needed to gather and compile it all or that data collected may not be complete.	At this time, the data is manageable.
There is a risk that not all land use types have associated groundwater nutrient data. In this instance, assumptions will be required to estimate nutrient loading from specific land use types.	This risk cannot be evaluated at this time.

**Schedule & Cost Evaluation:**

Total expenditures to date are slightly below estimated values. This is primarily due to the slow inflow of data. Many of the contacts have been made but most of the data that is in house has been remotely accessed. As larger amounts of data begin to be received, specifically in hard copy, the expenditures should increase with the added data entry and interpretation needs. The first large amount of hard copy data is expected to arrive the week of 20 May 2002 from STPUD and El Dorado County Environmental Management.