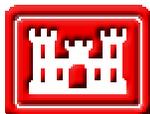

Lake Tahoe Framework Study Project Management Plan

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of Engineers®**

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**Lake Tahoe Framework Study
Project Management Plan**

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Lake Tahoe Framework Study Project Management Plan

Executive Summary: This Project Management Plan (PMP) details the scope, schedule, budget, and ancillary information necessary to produce a report to provide a framework for implementing activities to improve environmental quality of the Lake Tahoe Basin. This report must be available to the Secretary of the Army such that the Secretary may take action if desired within 30 months of enactment of this Appropriation Act. This report will not recommend specific projects. The report will present alternatives to provide the framework requested. To accomplish this task, and with scope contribution from local stakeholders, this study includes five project elements. These five elements provide both short-term and long-term benefits to the Lake Tahoe Basin. Local stakeholder participation in this scope was a primary factor in allocation of funding among the five elements of work. The five elements of work, as detailed later, include:

- Element One (Framework for Implementing Activities)
- Element Two (Groundwater Evaluation)
- Element Three (Wastewater Line Risk Evaluation)
- Element Four (Urban Storm Water)
- Element Five (Stream Erosion Evaluation)

1. Historical Context

Lake Tahoe is an extraordinary alpine lake celebrated by Mark Twain, John Muir, and Washoe Tribe elders. Lake Tahoe is an irreplaceable national treasure featuring startling clarity, extreme depth, and natural diversity. But this large alpine lake is at a crossroads. Measurements of lake clarity gathered over thirty years show a loss of over one foot of visibility per year. This represents a 30% decline during that period. The decline in water quality is strongly correlated with human activities. Scientists believe that if declining water quality is not arrested, the decrease in clarity of Lake Tahoe will be irreversible within a decade.

In 1996, Nevada Senator Harry Reid and a powerful coalition of community and agency stakeholders sought coordinated solutions to the environmental and economic dilemmas posed by Lake Tahoe. President Clinton's Lake Tahoe Forum was the major

initial success of this new partnership. President Clinton came to Lake Tahoe in July 1997 to recognize the significance of Lake Tahoe and its surroundings as a national environmental resource, and to commend local stakeholders for the innovative partnerships of government, business, and environmental interests working together to protect the Tahoe Basin. During the Presidential Forum, the President committed additional federal resources to address concerns related to the declining lake clarity, and to make improvements in transportation, air quality, and forest health. The President committed the Federal government to develop partnerships with local and state governments, the Tahoe Regional Planning Agency (TRPA), and the Washoe Tribe to coordinate all federal activities in the Basin to achieve greater environmental results. The Assistant Secretary of Army (Civil Works) was an inaugural party to these agreements and Memorandums of Understanding, including the Lake Tahoe Federal Interagency Partnership. Other significant accomplishments include:

- The Environmental Improvement Program (EIP) was adopted by TRPA in 1998 as the strategy to achieve the environmental goals for the Lake Tahoe Basin through implementation of capital improvement projects and programs. Most other agencies and community groups, including the Federal Interagency Partnership, have expressed support for the EIP as the basis for arresting further deterioration of the lake.

- The TRPA and USDA Forest Service co-sponsored Watershed Assessment (WA) was released in February 2000. The WA provides a comprehensive knowledge base that can inform a basin wide restoration and management strategy. The WA compiled and reviewed the scientific basis for the EIP. The WA stops short of defining management practices for the watershed.

- The Lake Tahoe Restoration Act (PL 106-506) was signed into law in December 2000. This act authorizes \$300 million through the Department of Agriculture for restoration activities in the basin, with emphasis on erosion control and fuels management. Actual appropriations have not kept up with the stated intent of the act.

- A qualitative prioritization for EIP including a Financial Plan was compiled initially in 2001. The Financial Plan includes a listing of existing Federal, State, and local authorities that could be used to fund projects in the EIP. As a part of the adaptive management approach to restoration, this work will be ongoing.

Current US Army Corps of Engineers (Corps) activity in the Lake Tahoe Basin relative to this effort dates from reconnaissance level activities just prior to the Presidential Forum in 1997. The Presidential Forum announced 39 specific actions to protect Lake Tahoe, at a cost of \$27.7 million. These 39 actions, known as the Presidential Commitments, included two indicating that the Corps would conduct water quality, wetlands habitat, and other restoration efforts with the local communities and TRPA. No cost share agreements have been signed to date. Two on-going Aquatic Ecosystem Restoration (Section 206) projects have not yet reached the stage of negotiating a cost share agreement. A key challenge in the Lake Tahoe Basin will continue to be joining the Corps process into an established and on-going multi-agency watershed restoration program.

2. Situational Context

- Total Watershed Area – 506 sq. mi.
 - Lake Surface Area – 192 sq. mi.
 - Avg. Lake Surface Elevation – 6,223 feet above msl.
 - 3rd Deepest Lake in North America, Maximum Depth – 1,645 feet.
 - Surrounding peaks elev. 8,000-10,000 ft.
 - 77% of the land is Federally managed, 10% state managed.
 - 70% of the watershed in California and 30% in Nevada.
 - 75% of marshlands have been filled.
 - 30% of the trees are classified as diseased or dead (997).
 - Only 10% of the of old-growth conifer forest remains.
 - 48,000 jobs representing over \$1 billion in wages.
 - Major recreational activities include gaming and entertainment, golfing, water sports, hiking, fishing, camping, bicycling and snow sports (largest concentration of ski resorts in America). 9 million visitor days and \$1.6 billion in expenditures annually.
-

3. Project Background

The 2001 Lake Tahoe “August Event” provided a forum for senior Corps leadership to gain a greater appreciation for Lake Tahoe’s regional EIP and view individual EIP successes. Follow up discussions between Senator Reid and LTG Flowers indicated an opportunity for further effort on the part of the Corps. These

discussions ultimately resulted in an FY02 appropriation for work at Lake Tahoe.

Act Language: ‘...that using \$1,000,000 of the funding provided herein, the Secretary of the Army, acting through the Chief of Engineers, is directed to conduct a comprehensive watershed study at full Federal expense to provide a framework for implementing activities to improve environmental quality of the Lake Tahoe Basin and the Secretary shall submit a feasibility level report within 30 months of enactment of this Act.’

Initial discussion regarding possible work in this regard actually predated the August Event. The Corps worked closely with TRPA staff to identify critical unfulfilled or un-sponsored needs of the EIP that fit traditional Corps subject matter. Several options were explored and a foundation set for an FY02 execution with reprogrammed funds under a proposed cost share agreement with TRPA.

Following the passage of the FY02 Appropriations Act, these previously discussed project scopes, which seemed to fit the intent of the appropriations language, were further developed. These elements of work and the format of the report were discussed in a conference call between HQ, SPD, and SPK at the end of October. At this early stage of the project, it was speculated that the requested report would be at a feasibility level of detail, but could go directly to Congressional committees rather than follow the traditional Feasibility Report or Framework Report process. The uncertain nature of continuing study funding shaped some of this early decision-making.

In mid-November 2001, it became apparent that TRPA, the stakeholder group originally coordinated with, did not sufficiently represent the entire Basin. Coincidentally, a strong environmental advocacy group disagreed strongly with some of the proposed scope developed with TRPA.

Further outreach identified a much broader stakeholder base (see later description of stakeholders). In meeting with this much broader stakeholder base, a conceptual scope was developed for the study. At this point, it was still believed that a formal Feasibility Report recommending some authorization could be secondary to the primary effort of producing a report for submission to Congress. Criteria for the framework study project options developed with the broader stakeholder base included:

- Project subject matter that was basin-wide in scope (i.e. ‘Comprehensive’).
- Projects that were either direct improvements to ‘environmental quality’ or indirectly led to improvements of ‘environmental quality’ through the

establishment of criteria for further projects.

- Projects that fit the overall Corps mission and our role as established in the original Federal Interagency Partnership/Presidential Forum documents.
- Projects that were “ripe” for execution.
- Projects that could result in a useful product to improve ‘environmental quality’ even if FY03 & FY04 funding did not materialize.
- Projects that are un-funded by other EIP and Federal Partnership sources.

The stakeholders agreed upon the conceptual scope of work for four separate but related evaluations (Element Two through Element Five, as described below) by early December 2001. The elements of the conceptual scope were communicated with SPK/SPD staffs. As no objections were raised concerning the scope material, resources were identified and work was initiated in early December.

In January 2002, continued outreach identified potential legislative intent that might not be sufficiently met by the four elements of work identified by local stakeholders. These indications also made clear that SPK uncertainties regarding FY03 & FY04 funding were not warranted. Direct communication with Appropriation Subcommittee Staff in mid January 2002 caused an additional focus of work (Element One, as described below).

In an effort to insure both legislative intent and the preference of local stakeholders are met by the framework study, local stakeholders initialed a dialogue with Senator Reid’s staff and appropriation sub-committee staff. This dialogue included a face-to-face meeting of stakeholders with Senate staff and appropriation subcommittee staff in Washington D.C. in March 2002.

A potential impasse was reached in June 2002 regarding whether or not the study report to Congress should include recommendations or present alternatives. This discussion resulted in a conference call on July 2, 2002 with SPK leadership, SPD, local stakeholders, and Congressional staff. The options presented included:

Corps Recommendations: When the Corps “recommends” an action in a report to Congress, it means that the agency has conducted a technical, economic and policy analysis, and concluded that the recommended action is compliant with the Administration’s current budgetary priorities. Since the recommendation is a decision document, an appropriate environmental document is required. A Corps report that makes a recommendation to

Congress can be viewed as **both a technical and a policy approval document**. All formal recommendations in Corps reports to Congress are reviewed and approved by the Assistant Secretary of the Army (Civil Works) and OMB before being officially transmitted to Congress.

Corps Alternatives: When the Corps “presents alternatives” in a watershed study, it means that the agency has conducted a scientific analysis, and has found a need for the additional measures in the basin. While the report may suggest the most logical parties to execute the measures, the alternative implementation strategies presented in a Corps watershed study are viewed as “findings” and not “recommendations.” Although the alternatives are evaluated and compared, no alternative is explicitly recommended. Generally there is no NEPA document required. The report in which the Corps presents alternatives can be viewed as a **technical document only**.

Following discussion, both the Corps and local stakeholders agreed that the best report alternative would look like a modified watershed framework report without a specific “recommendation,” but with “alternatives” that included:

- A report to Congress that presented maximum opportunity for enhanced Federal participation in the restoration of Lake Tahoe.
- A report that incorporated alternatives for all Federal agencies of the Lake Tahoe Federal Interagency Partnership.
- Integral participation of stakeholders in decision-making.
- Maximum flexibility on the part of the Corps process to meet the needs of local stakeholders.

It was understood that the “alternatives” might eventually result in projects to be undertaken by the Corps or other Federal Agencies under their existing or new authorities.

More coordination, brainstorming, conversations and meetings with local stakeholders regarding the study scope ensued. This resultant scope, including five elements of work, is the best fit for the combination of the complex relationships in the Lake Tahoe Basin, internal Corps instruction to ‘not be constrained by traditional processes,’ and a pragmatic appraisal of end products that meet project long-term objectives.

This Project Management Plan (PMP) reflects this latest guidance. Where appropriate, the PMP will separate major categories of PMP information by these five

elements to add clarity. Individual Technical PMPs are incorporated into the PMP by reference.

4. Summary of Project Scope

The Watershed Plan project scope includes five elements:

- Element One (Framework for Implementing Activities)
- Element Two (Groundwater Evaluation)
- Element Three (Wastewater Line Risk Evaluation)
- Element Four (Urban Storm Water)
- Element Five (Stream Erosion Evaluation)

Establishing a Partnership: The Corps participates in several informal Lake Tahoe multi-agency efforts and one formal partnership of Federal agencies. Creating new formal and informal relationships that go beyond the Lake Tahoe Federal Interagency Partnership established in 1997 will enhance the broad study described in this PMP. Planned actions include:

Memorandum of Understanding: A Memorandum of Understanding (MOU) will be signed with Tahoe Regional Planning Agency (TRPA) and the Corps of Engineers. Similar MOUs will be pursued with representative agencies for both the State of California and the State of Nevada. The MOU will provide for the same process cooperation that a cost sharing agreement provides in traditional Corps projects. An MOU is less formal than the traditional Corps cost sharing Memorandum of Agreement.

Collaborative: A critical element of this study will be the establishment of a collaborative process to provide broad community stakeholder participation in the process. This Corps study collaborative will also help set the framework for a broader collaborative process that will be undertaken in the basin to address Basin-wide planning efforts implementing the goals of the EIP. An outside party will organize and guide the collaborative so that participation and voice will be on an equal and objective basis. The organizer/facilitator may be a private consultant or a specialist with an agency outside the Corps, such as EPA. The organizer/facilitator will manage the collaborative effort including administrative efforts, but the Corps will develop the final report. The initial step of this collaborative process will be selection and contracting to a consultant acceptable to both the Corps and local stakeholders. This contract will be in

two phases. Phase One will develop a comprehensive strategy for the rest of the process. Phase Two will implement the developed strategy.

The development of this collaborative process will ultimately provide the development process for a broader collaborative in support of EIP implementation. The synergy of these overlapping collaborative end goals supports the established Lake Tahoe Federal Interagency Partnership, Federal application to develop a long-term vision and strategy for the Basin, and implementation of environmental restoration actions to achieve this vision.

There is recognition by some of the Basin leaders that the status quo communication and coordination is not enough to ensure long-range planning needs are adopted and implemented by Basin stakeholders. A collaborative approach is needed to provide an opportunity for a broader spectrum of the community to participate in the planning process. This collaborative process will be guided by key agencies and entities in the Basin with possible support from foundations and other stakeholders outside the Basin.

The Lake Tahoe agencies are beginning long-term planning processes, which will impact the environmental management of the Basin for the next twenty years. TRPA will be developing a new twenty-year Regional Plan, which will include changes to the environmental threshold standards. The Forest Service will be updating its Basin Management Plan on the same schedule in order to ensure consistency between the plans to help support the research and monitoring currently underway to support these planning efforts. The technical backbone for Basin restoration and protection is the Lake Tahoe Total Maximum Daily Load (TMDL), currently under development by the Lahontan Regional Water Quality Control Board. All of these efforts will be completed by 2007. TMDLs are considered the technical backbone for Basin restoration because the numerical values developed and apportioned through the TMDL process will drive threshold regulation in the Basin for decades into the future.

A collaborative process requires a specialized contractor. Final decision for how this collaborative effort will be contracted has not been finalized. Options include contracting thru either the US EPA or the Corps. Both options include arguments in their favor. The efforts have been budgeted at \$330,000 over 24 months.

Work-in-Kind: Corps studies executed under cost sharing agreements require a contribution from the non-Federal sponsor to support the cost of performing

the study. Generally, the cost sharing Memorandum of Agreement also includes some provision for the non-Federal Sponsor to provide work-in-kind as a substitute for cash payment. In this study, though not requiring any cost sharing agreement, the non-Federal partners are contributing significant hours of effort on a non-agreement basis to enhance the final product. This work-in-kind has included technical collaboration, management collaboration, field assistance, office space, meeting room space, public outreach, data collection and correlation, etc. This work-in-kind is heavily weighed in the collaborative effort, groundwater evaluation, and stream erosion evaluation. The fair value of this work has not been determined at this point.

4.1 Element One (Framework for Implementing Activities): This element of the Framework Study will develop and evaluate alternative institutional frameworks for implementing environmental improvement measures in the Lake Tahoe Basin, with an emphasis on enhancing the support of the federal government. Existing information regarding environmental problems and opportunities in the Lake Tahoe watershed will be reviewed and synopsisized. Existing and future (without-project) environmental conditions will be described and potential management measures will be identified based on the existing TRPA Environmental Improvement Program (EIP). The EIP is composed of over 700 measures (projects) that have been identified and evaluated based on broad input over a period of years. Because budget and schedule constraints preclude the development and evaluation of new measures as part of this study, the study will focus on the previously identified EIP measures. If additional measures are identified, they will be noted for possible consideration in future studies. The Corps will rely on TRPA to provide current information regarding the implementation status of the individual EIP projects.

The potential management measures will be evaluated and screened to identify measures that are beyond the immediate capability of non-federal interests. A detailed analysis will be performed to correlate those measures with existing Federal and non-Federal agency missions, authorities, and funding capabilities in an implementation framework. "Orphan" measures that cannot be implemented in a timely manner under existing constraints will then be identified. These orphan measures will be loosely prioritized according to the urgency of their implementation (e.g., immediate, short-term and long-term). This general ranking of orphan measures will help guide the formulation of alternative implementation frameworks.

Implementation strategies for the orphan measures will then be developed. The

implementation strategies may include increases in funding or authority for specific agencies, creation of a comprehensive interagency program, etc. These implementation strategies will be combined into several alternative implementation frameworks according to their degree of departure from existing agency missions, authorities, and funding. The alternative implementation frameworks will be evaluated for their effectiveness, efficiency, completeness and acceptability. Due to budget and schedule constraints, the evaluation of individual measures will be based on information in the EIP. EIP project benefits have been quantified in terms of their contributions toward improvements in designated environmental thresholds. These environmental thresholds are standards of measurement that are used in the Tahoe Basin to measure the effectiveness of environmental management programs and regulations. The costs of the individual EIP measures have also been estimated by TRPA. A preferred implementation framework may be selected based on stakeholder support. The resulting report will be identified as a Framework Study.

Because of the limited scope of this framework study, and because of budget and schedule constraints, the SPD study milestones must be significantly adapted. In lieu of a public workshop upon initiation of the study, a public involvement plan will be developed with TRPA to identify the most appropriate and productive approach to soliciting public input, and the best timing for public involvement in coordination with the stakeholder involvement process for this study and other TRPA activities. Rather than holding a separate Feasibility Scoping Meeting (F3 conference) and Alternative Formulation Briefing (F4 conference), an In-Progress Review (IPR) will be held during preparation of the draft report.

Sub-task 1: In-Progress Review: Plan and carry out an In-Progress Review to assure acceptance of scope of work as proposed in Project Management Plan. The IPR shall include local partners, Sacramento District, South Pacific Division and HQUSACE. This task includes funding for Planning Division to participate in the IPR and immediate follow-up activities.

Sub-task 2: Stakeholder Involvement: A critical element of this effort will be the stakeholder involvement process. This will include the broad collaborative effort described above and the development and implementation of a public involvement plan in coordination with TRPA. This task includes funding for the Planning Division to provide support in developing a detailed scope of work for a stakeholder involvement contractor and participating in stakeholder involvement meetings. Funding for the contract is displayed at the overall project level.

Sub-task 3: Review and Synthesize Existing Information: Review and synthesize existing information regarding problems, opportunities, objectives, and constraints, as well as the status of existing environmental management programs in the Basin. The four volumes of the EIP, the two volumes of the Watershed Assessment, two 905(b) reports (30 June 1997, 30 September 1998), Reconnaissance Report (Montgomery Watson, October 1998), and Federal Interagency Partnership Review of the Environmental Improvement Program for the Lake Tahoe Region (August 1999) will serve as fundamental documents in this review.

Fundamental to this framework study is the idea of capitalizing on work performed to date by other members of the greater EIP team. The Watershed Assessment is largely a USDA Forest Service document and therefore enjoys approval by that agency. The EIP does not yet have formal acceptance by any Federal agency. The EIP, Watershed Assessment and other planning documents will be reviewed for general reasonableness, but no detailed technical re-evaluations will be performed. If a need for further technical studies is identified, they will be noted for possible future investigation.

Sub-task 4: Analysis of EIP for Orphan Projects: Previously identified management measures (EIP projects) will be correlated with existing Federal and non-Federal implementation programs. It is anticipated that this process will identify specific EIP projects by number along with the most likely responsible agency (with existing authority and funding). A contractor with experience in environmental policy analysis and knowledgeable regarding a wide range of Federal, state and local environmental programs, will perform the majority of this analysis, as well as assisting with subsequent related tasks. Measures for which existing implementation programs are identified, and which are likely to be implemented even without changes in funding, authorities or institutional roles, will be considered in the estimation of the without-project future conditions for this study during Sub-task 5.

Management measures for which there is no existing Federal or non-Federal implementation program (“orphan projects”), or which are not likely to be implemented in a timely manner under existing programs, will be designated for consideration during the development of alternative implementation strategies under Sub-task 6.

Sub-task 5: Existing and Without-Project Future Conditions: Inventory existing conditions and forecast without-project future conditions based on existing

information. Forecasting of without-project future conditions will consider the likely effects of funding and other constraints on the implementation of environmental management programs in the Lake Tahoe Basin, including EIP. Risk and uncertainty regarding the forecast of future conditions will be described.

Sub-task 6: Formulate, Evaluate and Compare Alternative Implementation

Frameworks: Based on collaborative input from Federal and non-Federal agencies, implementation strategies will be developed for the management measures identified in Sub-task 4. Implementation strategies may include increases in funding or authority for specific agencies, or the creation of a more comprehensive interagency program. These implementation strategies will be combined into several alternative implementation frameworks according to their degrees of departure from existing agency missions, authorities and funding. It is anticipated that a significant part of the study effort will be directed toward developing the concept of a comprehensive interagency program in collaboration with other Federal and non-Federal agencies.

Alternative implementation frameworks will be evaluated and compared using basic planning criteria (including effectiveness, efficiency, completeness and acceptability) relative to the specific objectives of the framework. Evaluation of the alternative implementation frameworks will be largely based upon evaluation of their component management measures. The evaluation of individual measures will be based on existing information in the EIP. EIP project benefits have been quantified in terms of their contributions toward improvements in designated environmental thresholds. The costs of individual EIP measures have also been estimated by TRPA. Environmental evaluation of the alternative implementation frameworks will be limited to a general description of major environmental considerations, potential short-term and long-term effects, and probable environmental compliance requirements. Compliance with NEPA and other environmental requirements will be accomplished prior to the implementation of any specific measures or programs.

Sub-task 7: In-Progress Review: An In-Progress Review will be held with the primary partners and SPD during preparation of the draft report. This IPR will take the place of the standard Feasibility Scoping Meeting (F3 conference) and Alternative Formulation Briefing (F4 conference). The IPR will review the proposed outline and general content of the report before it reaches an advanced stage.

Sub-task 8: Prepare Draft Report: A draft framework report will be prepared and reviewed by an independent technical review team.

Sub-tasks 9-11: Submission of Draft Report/Public Review/Final Report:

The draft framework report will be submitted to South Pacific Division to obtain approval for public distribution. The draft report will then be circulated for public and agency comment. A public meeting will be held in the Basin during the comment period. Comments will be addressed in the final report, which may identify a preferred implementation framework, depending upon stakeholder response to the draft report. Public notice regarding availability of the final report will be issued by the District Engineer. Comments received in response to the District Engineer's public notice will be addressed and furnished to HQUSACE for transmittal to ASA(CW). The final report will be transmitted to Congress in accordance with the study authorization.

Non Task-Specific Effort

Engineering Division

The identified required inputs from Engineering Division in this framework study are minimal. The general scope for the Engineering Division representative will be to broadly represent an engineering interest and call attention to any issues requiring more formal engineering input. The Engineering team member included will have a strong background in hydrology and hydraulics. Tasks identified below, plus any new tasks identified following initiation of work, are expected not to exceed 10% of one journey level (minimum) staff person over 18 months. Tasks identified include:

- Review existing and newly generated (by others) information.
- No generation of new or independent data, calculations.
- Produce summary text for engineering constraints at a programmatic level applicable to Framework alternatives.
- Estimate programmatic level of engineering involvement and budget for alternatives as a percentage of total program/project cost.
- Attend team meeting and public meetings as requested by the project manager.

Civil Design Branch work is estimated at less than 10% of one staff person plus support.

Environmental Engineering Branch work is estimated at 0% at this time for this element. Additional Environmental Engineering Branch work is included in the Groundwater Evaluation portion of the study

Military Branch work is estimated at 0% at this time.

Cost Branch work is estimated at 0% at this time. The project manager and the Chief of Cost Branch reached this conclusion jointly based on the scope of effort defined at this time.

Geotechnical Branch work is estimated at 0% at this time. The project manager has reached this conclusion based on email from the Chief of Geotechnical Branch postulating possible Geotechnical inputs. These possible Geotechnical inputs do not currently fit into the scope of effort defined at this time.

Real Estate Division

The identified required inputs from Real Estate Division in this framework study are minimal. The general scope for the Real Estate Division representative will be to broadly represent real estate interests and call attention to any issues requiring more formal real estate input. The Real Estate team member included will have a strong general background in the general Corps Civil Works program and all real estate specialties. Tasks identified below, plus any new tasks identified following initiation of work, will not exceed 10% of one senior level staff person over 18 months. Tasks identified include:

- Review existing and newly generated (by others) information.
- No generation of new or independent data, calculations.
- Produce summary text for Real Estate at a programmatic level applicable to Framework alternatives.
- Estimating programmatic level of Real Estate involvement and budget for alternatives as a percentage of total program/project cost are not included in this estimate.
- Coordinate with real estate counterparts in Federal agencies with land management functions in the Lake Tahoe Basin to determine opportunities for

joint land use not currently available for programs that may be alternative from this report.

-Attend team meeting and public meetings as requested by the project manager.

Construction-Operations Division

The identified required inputs from Construction-Operations (C-O) Division in this framework study are minimal. The general scope for the C-O Division representative will be to broadly represent any wetlands interests and call attention to any issues requiring more formal wetlands input. The C-O team member included will have a strong background in wetlands permit requirements, especially under Section 404 of the Clean Water Act. Tasks identified below, plus any new tasks identified following initiation of work, will not exceed 5% of one journey level (minimum) staff person over 18 months. Tasks identified include:

-Review existing and newly generated (by others) information.

-No generation of new or independent data, calculations.

-Produce summary text for wetland and water quality constraints at a programmatic level applicable to Framework alternatives.

-Estimating programmatic level of C-O involvement and budget for alternatives as a percentage of total program/project cost are not included in this estimate.

-Attend team meeting and public meetings as requested by the project manager.

4.2 Element Two (Groundwater): Analyzes, maps, and quantifies nutrient loading impacts caused by groundwater on overall lake clarity. This element also develops possible remedial measures to reduce this nutrient loading. This will include understanding of known and potential nutrient (phosphorus and nitrogen) sources, hydrogeology and groundwater flow patterns, and recommended alternatives for potential reduction of nutrient loading to groundwater. The study will involve review and consolidation of existing data relevant to the groundwater study, identification of any data and knowledge gaps, and determination of high and low risk areas where possible. No field sampling is expected as part of this phase of the study. Recommendations on future work that will further refine the understanding of groundwater influences on Lake Tahoe water quality will be included in the study. The products for Element Two will

include both a technical appendix to the Framework Report and a stand-alone technical report for immediate use by the local stakeholders. This stand-alone technical report will be used by 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.

4.3 Element Three (Wastewater Line Risk Evaluation): Identifies and prioritizes remedial measures that can be deployed to reduce the risks of release of nutrients and other pollutants from wastewater collection facilities around Lake Tahoe. These measures will represent a toolbox of best management practices (BMPs) that can be customized to address the specific problems facing each district. BMPs may include structural measures such as pipe relining or installation of pump station improvements. BMPs may also include non-structural measures such as improved operation and maintenance and increased inspections and monitoring.

Early actions to protect Lake Tahoe's water quality included the provision of wastewater (sanitary sewer) lines to all developed areas and facilities for treatment and export of all wastewater from the basin. This substantial program spanned over ten years and was finished in the late 1970s. Currently eight sewer districts operate within the Lake Tahoe Basin. These include:

- South Tahoe Public Utility District (STPUD)
- Tahoe City Public Utility District (TCPUD)
- North Tahoe Public Utility District (NTPUD)
- Incline Village General Improvement District (IVGID)
- Douglas County Sewer Improvement District No.1 (DCSID), and three satellite collection systems of DCSID:
 - Kingsbury GID
 - Tahoe-Douglas PUD
 - Roundhill GID

These eight districts serve approximately 44,000 customers with approximately 900 miles of sewer lines within the Basin. IVGID, STPUD, and DCSID operate wastewater collection and treatment facilities within the Tahoe Basin and effluent export lines, while NTPUD and TCPUD export raw sewage for treatment at Truckee.

Current conditions strongly support a comprehensive, basin-wide evaluation of the condition of Tahoe's wastewater facilities. As much of the system approaches 40 years old, sewage spills, exfiltration, and overflows potentially threaten the water quality of Lake Tahoe and public health and safety. Many existing sewer lines are located below the water table, in stream environment zones, or within the lake. There is also evidence suggesting that Lake Tahoe's waters can be quite corrosive. Significant spills have occurred in the past, and the potential for larger, more catastrophic spills is increasing (USACE, 9/98, Montgomery Watson for USACE).

There is also regulatory support for an assessment of Tahoe's sewers from TRPA, the Lahontan Regional Water Quality Control Board and the US Environmental Protection Agency (EPA).

Tasks shall include:

- Establish and Monitor Goals and Objectives including stakeholder meetings during Phase II.
- Collect and Review Data.
- Define Planning Constraints and Criteria.
- Establish Basis for Design.
- Identify Problems and Needs.
- Develop Estimate of Exfiltration Rates.
- Identify and Screen Measures.
- Compare and Select Preferred Measures.
- Report - Recommended Action Plan.

4.4 Element Four (Urban Stormwater): Develops a Work Plan or PMP to explore alternatives for urban storm water management (BMPs) and impacts to overall lake clarity. Relatively major urban centers have developed along portions of the north and south shores. The impacts from urbanization, urban storm water specifically for this study, have contributed to the degradation of the Lake's water quality. The PMP will provide a valuable study management tool that will identify the scopes of work that will be used for requesting and allocating funds and resources, and will form the basis for identifying commitments between the Federal and non-Federal participants. The products for Element Four will include both a technical appendix to the Framework Report and a stand-alone technical report for immediate use by the local stakeholders.

4.5 Element Five (Stream Erosion): Performs statistical and site analysis to develop sediment and nutrient contribution to Lake Tahoe from stream erosion. Product will be

a bulk number of nutrient contributions for the Basin, with breakdown by watershed types. Product will also explore quantification of lake clarity impacts due to stream erosion.

The Lake Tahoe Basin's long history of human interaction and exploitation threaten irreparable damage to lake clarity, which has been partly attributed to the delivery of fine-grained sediment emanating from upland and channel erosion. Because lake clarity is related to the very fine particles that remain in suspension and that transport adsorbed constituents, it is essential to identify the load of fine-grained materials. Selection of appropriate management strategies must be founded on the identification of the controlling processes and associated source areas of fine sediment. These source areas can be broadly separated into uplands and channels. More specifically upland sources may include slopes, fields, roads, constructions sites gullies etc., while channel sources may include channel beds, bars and streambanks.

Sub-Task 1: Analysis of sediment and nutrient loads and temporal trends to Lake Tahoe from stream channel erosion.

At the outset of the project hard copy and/or digital maps and air photos will be obtained for the entire watershed and registered in a GIS framework. In addition, a review of previous studies and additional data and analyses will be conducted. All historical flow, sediment transport, and particle size data from U.S. Geological Survey gauging stations will be downloaded for use in determining trends of channel morphology over time and to establish sediment- and nutrient-transport rating curves. Precipitation and snowfall data will also be acquired from available sources.

The research approach to address the five sub-objectives combines empirical analysis of field reconnaissance and site-specific data with historical data on flow, sediment transport, land use and stream morphology with deterministic numerical simulations of channel erosion and adjustments. Broad reconnaissance techniques (by air, ground, and data analysis) will be used to initially characterize streams and watersheds into groups (perhaps stable/unstable, western, eastern, northern and southern) then select a representative stream(s) from each group that has an extensive historical data base of flow, sediment transport, bed-material characteristics and morphology to perform detailed field work and numerical simulations. Air and ground reconnaissance will involve rapid geomorphic assessments (RGAs) of stream-channel conditions and identification of the dominant geomorphic processes, extent of channel

instabilities, and stage of channel evolution. As part of the RGA procedure, a semi-quantitative channel-stability index will be calculated for numerous sites along the studied streams based on diagnostic criteria obtained during each RGA. This index has been shown to vary with stage of channel evolution and may prove useful to differentiate ranges of sediment and nutrient loadings within and between groups. In addition, samples of bed material will be obtained at many ground reconnaissance sites for use in determining embededness parameters and estimates of critical shear stress. The RGAs will be supplemented by interpretation of air-photo and digital land-surface coverage to identify important sources of sediment.

Sediment-transport rates for all streams with available data will be analyzed to determine seasonal and annual loadings, and loadings at the effective discharge by particle-size class. Where data are available on nutrient concentrations and corresponding flow, similar transport ratings will be established. Because of the uncertainty in determining the recurrence interval of the effective discharge in the Lake Tahoe Basin an extensive analysis of the data from the existing 38 monitored sites with sufficient data will be performed. These data will be sorted by group to identify similarities and differences within and between groups. Differences within groups will probably be related to differences in land use and channel/watershed stability. Those sites identified as stable (as determined by reconnaissance) will be treated as preliminary references, representing “naturally occurring” conditions by which to compare loadings from impacted areas. One such stream may be General Creek that has been mentioned in the literature as a “control” stream for conditions on the western side of the basin. Loadings and embededness characteristics from these sites may then be used as a starting point for developing water-quality targets for sediment.

Sub-Task 2: Determine a bulk loading number for sediment from individual streams, and the relative contributions of fine and coarse materials for use in subsequent TMDL analysis.

Rates of sediment transport at gauging stations provide information on bulk loadings past the respective gage over various periods of time. To more accurately evaluate loadings directly to Lake Tahoe and to differentiate between upland and channel sources, numerical simulations will be performed on representative watersheds within the Lake Tahoe Basin. Intensive field-data collection of channel cross sections, bed-material particle size, bank-toe erodibility and bank-material shear strength will be carried out *in situ* along each of the modeled streams. The AGNPS model will be used to generate upland flow and sediment contributions to the main channels. The AGNPS

output will be used in conjunction with historical flow records to generate some of the model inputs for the CONCEPTS channel evolution model. This deterministic numerical-simulation model routes flow and sediment down the channel and has the ability not only to simulate vertical changes on the channel bed but also hydraulic-induced bank-toe erosion and geotechnical mass failure of streambanks. Because of the wealth of flow data in the basin and the fact that streams selected for modeling will have the most extensive historical and current data bases, CONCEPTS simulations will not be highly dependent on AGNPS output. In this way sediment contributions from the streambed and streambanks can be separated and calculated for various flow scenarios. If time-series historical profiles and cross sections are available, CONCEPTS can be fine tuned to accurately model known historical changes. A sediment-budget approach can then be used to compare the amount of sediment leaving the uplands, stored or eroded in the channels, and ultimately delivered to the lake from various sources. Various land-use scenarios will also be tested with AGNPS to represent changing upland delivery of sediment over time.

The detailed modeling results from the selected, representative watersheds will then be applied to those watersheds where modeling was not performed. Adjustments to the modeled values will be based on characteristics of the channel and watershed obtained from RGAs, aerial reconnaissance and analysis of digital land-surface data for those streams that are represented by the modeled watershed.

The effects of large events such as those that occurred in the basin in 1997 will be addressed in several ways. These large events leave observable evidence of their passage and effects. Failure surfaces and areas of rapid deposition can be identified during field evaluations and through dendro-chronology (use of tree ages to determine the age of geomorphic surfaces) to determine the timing and amount of erosion or deposition. Shifts in stage-discharge and sediment-transport ratings will be studied to evaluate any changes in sediment transport rates before and after the 1997 events. Finally, numerical simulations of the representative watersheds will include the 1997 events, making interpretation of subsequent responses and loadings more robust.

Sub-Task 3: Specify in detail the methodology used to determine estimates of loadings and reference conditions.

Sub-Task 4: Determine what combinations of watershed and stream condition, soil type, rainfall characteristics, etc. pose the greatest hazard in terms of sediment erosion and delivery for the purpose of prioritizing areas requiring restoration for certain

levels of runoff and streamflow.

The potential effectiveness of restoration measures either upland or channel can be estimated by adjusting components of the numerical models such as bank strength (in CONCEPTS) or land use (in AGNPS). Performing model simulations using the same precipitation characteristics for a scenario of continued urbanization will also be able to demonstrate changes to the risk of accelerated stream erosion.

Sub-Task 5: Provide suggestions as to future data needs and research projects.

Results of the proposed research will be produced in written and digital format in the USDA-ARS National Sedimentation Laboratory Research Report series. The report and accompanying CD will include all field and analytic data collected and analyzed, including summaries of the following data: RGAs and channel-stability index values, bed material particle-size, geotechnical tests, and sediment and nutrient transport curves. Maps showing channel conditions within the Lake Tahoe watershed and color-coded as to the severity of the erosion problem will be included. Modeling results and the methodologies used to extrapolate to other representative watersheds will be clearly detailed. Finally, estimates of preliminary reference conditions, loadings and channel sources to Lake Tahoe using parallel lines of evidence will be listed and described. The report will be delivered 12 months after the start of funding.

As stated, findings from Element Two through Element Five may identify potential measures to improve the environmental quality of Lake Tahoe Basin. These measures will be included into the report for Element One: Framework Report. At the onset of formal study, it is believed that Elements Two through Five will be identified as critical orphan projects for potential authorization. The local stakeholders have marked them for immediate detailed analysis in the first year of the study consistent with the concept of a Locally Preferred Plan (LPP).

5. Project Goal(s) and Objective(s)

Goals:

- Develop a comprehensive framework for implementing environmental restoration and protection measures for the Lake Tahoe Basin that is supported by regional stakeholders and concerned Federal agencies.

- Complete a final report no later than April 2004 (30 months after initial appropriation).
- Product to be viewed as viable future asset for Lake Tahoe restoration by identified state and local stakeholders and legislative representatives.
- Deliver interim technical findings to local stakeholders in support of ongoing EIP execution.

Objectives:

Common to All Elements

- Produce products that are responsive to customer needs.
- Produce products that do not duplicate work by stakeholders or others.
- Produce products that support further Corps assistance to Lake Tahoe.

5.1 Element One (Framework for Implementing Activities):

- Develop alternative frameworks for implementing regionally-supported management measures to improve the environmental quality of the Lake Tahoe watershed through collaborative Federal, State and local efforts.
- Identify an implementation framework that has the support of the broadest possible range of concerned Federal agencies and other regional stakeholders as a basis for additional Federal assistance.
- Identify, through local stakeholder input, EIP implementation programmatic needs.

5.2 Element Two (Groundwater): The specific objective of this study is to estimate nutrient loading (phosphorus and nitrogen) to Lake Tahoe through groundwater, determine known and potential nutrient sources, and recommend potential nutrient reduction alternatives.

5.3 Element Three (Wastewater Line Risk Evaluation): Develop a preliminary action plan describing a program of facility construction, rehabilitation, upgrading and management that will reduce the risk release of nutrients to the lake by foreseeable and preventable events for wastewater collection system facilities located in sensitive areas

such as lakeshore beaches, river crossings and wetlands, and higher risk facilities such as sewer system pump stations and large diameter force mains.

Develop alternative implementation approaches that meet the threshold for Federal interest and for continued Corps participation in the program as well as providing useful information to local sponsors and other stakeholders.

5.4 Element Four (Urban Storm Water): Deliver a PMP that defines required effort to support EIP urban stormwater goals and facilitates possible further Corps funding to execute urban stormwater study.

5.5 Element Five (Stream Erosion): Estimate sediment and nutrient loading (phosphorus and nitrogen) to Lake Tahoe through the stream erosion process and recommend potential nutrient reduction alternatives.

6. Milestones & Deliverables

Element One (Framework for Implementing Actions)				
Deliverable or Milestone	Time Frame	Est Hours of Effort	Cost	Date Of Completion
Sub-task 1: In Progress Review	1 Oct 02- 1 Nov 02	130	\$16,000	1 Nov 02
Sub-task 2: Stakeholder Involvement	1 Oct 02- 1 Dec 03	370	\$42,000	1 Dec 03
Sub-task 3: Review and Synthesize Existing Information	1 Oct 02- 1 Jan 03	380	\$42,000	1 Jan 03
Sub-task 4: Analysis of EIP for Orphan Projects	1 Nov 02- 1 Feb 03	240 + contract	\$100,000	1 Feb 03
Sub-task 5: Existing and without-project future conditions	1 Jan 03 - 1 Mar 03	485	\$53,000	1 Mar 03
Sub-task 6: Formulate and Compare Alternative Implementation Strategies	1 Feb 03 - 1 Jun 03	865 +contract	\$195,000	1 Jun 03
Sub-task 7: In Progress Review	1 Jul 03 - 1 Sep 03	205	\$23,000	1 Sep 03
Sub-task 8: Prepare Draft Report	1 Jun 03 - 1 Oct 03	1175 + contract	\$184,000	1 Oct 03
Sub-task 9: Public review of Draft Report and Public Meeting	1 Oct 03 - 1 Dec 03	285 + contract	\$38,000	1 Dec 03

Element One (Framework for Implementing Actions)				
Deliverable or Milestone	Time Frame	Est Hours of Effort	Cost	Date Of Completion
Sub-task 10: Prepare Final Report and District Engineer's Public Notice	1 Dec 03 - 1 Feb 04	500 + contract	\$96,000	1 Feb 04
Sub-task 11: Support for HQUSACE review and transmittal of Final Report	1 Feb 04 – 1 May 04	490 + contract	\$30,000	1 May 04
Planning Div. Travel & Per Diem (LS)	19 Aug 02– 1 May 04	-	\$18,000	
Engineering Div (LS)	19 Aug 02– 1 May 04	320	\$32,000	
Real Estate Div (LS)	19 Aug 02– 1 May 04	320	\$32,000	
C-O Div (LS)	19 Aug 02– 1 May 04	320	\$32,000	
TOTAL	19 Aug 02– 1 May 04	6405	\$1.18M w/inflation &contingency	1 May 04

Element Two (Groundwater)				
Deliverable or Milestone	Time Frame	Est Hours of Effort	Cost	Date Of Completion
Prepare for and attend technical and Team meetings, various locations (2-6 people attending w/ travel, 14 meetings)	1 Jan 02 – 1 Mar 03	387	\$38,600	Monthly
Kick-off meeting (3 people attending)	17 Dec 01	12	\$1,200	17 Dec 01
Initial stakeholder meeting to discuss scope (4 people attending, no travel expenses)	23 Jan 02	36	\$3,600	23 Jan 02
Draft Technical Project Management Plan (2 people part time over 3 weeks)	1 Jan 02 – 16 Jan 02	164	\$16,200	16 Jan 02
Final Technical Project Management Plan (2 people part time over 2 weeks)	16 Jan – 1 Feb 02	36	\$4,400	1 Feb 02
Interim Study Update (4 people attending w/travel)	Apr 02	64	\$6,5000	Apr 02
Attend public and stakeholder meeting to discuss study (4 people attending w/ travel)	13-14 May 02	64	\$6,500	14 May 02
Data Collection (10 people part time over 21 weeks, including travel expenses)	1 Feb 02– 31 Oct 02	2,765	\$250,700	31 Oct 02

Element Two (Groundwater)				
Deliverable or Milestone	Time Frame	Est Hours of Effort	Cost	Date Of Completion
In Progress Review (SAG et. al.)	24-31 May 02	0	\$1,700	31 May 02
Reduction Alternatives Formulation	1 Oct 02-31 Dec 02	502	\$48,000	31 Dec 02
Draft Groundwater Study Report (10 people, part time over 7 weeks)	1 Dec 02 – 17 Jan 02	541	\$50,700	17 Jan 02
Comment Resolution Conference (6 people attending with travel expenses)	17 Jan 03-17 Feb 03	45	\$5,000	17 Feb 03
Final Groundwater Study Report (10 people part time over 2 weeks)	17 Feb03 – 1 Mar 03	155	\$16,700	1 Mar o3
TOTAL	17 Dec 01– 1 Mar 03	4384	\$450,000	1 Mar 03

Element Three (Wastewater Line Risk Evaluation)				
Deliverable or Milestone	Time Frame	Est Hours of Effort	Cost	Date Of Completion
Technical PMP	18 Dec – 15 Feb 02	120	\$14, 557	8 Feb 02
Stakeholder Meetings	14 Feb - 6 Sep 02	432	\$41,899	6 Sep 02
Collect and Review Data	13 Feb – 12 Jul 02	700	\$58,230	12 Jul 02
Define Planning Constraints and Criteria, Technical Memorandum No. 1	25 Feb – 31 Mar 02	116	\$11,234	31 Mar 02
Establish Basis of Design	18 Feb – 30 Jun 02	144	\$12,539	30 Jun 02
Identify Problems and Needs, Technical Memorandum No. 2	18 Feb – 30 Jun 02	280	\$24,215	30 Jun 02
Develop Estimate of Exfiltration, Technical Memorandum No. 3	18 Mar – 12 Jul 02	184	\$15,477	12 Jul 02
Identify and Screen Risk Reduction Measures	27 May – 9 Jul 02	460	\$37,762	9 Jul 02
Preferred Alternatives, Technical Memorandum No. 4	8 Jul – 23 Aug 02	300	\$27,227	23 Aug 02
Final Action Plan Report	15 Jul – 30 Oct 02	292	\$42,666	30 Oct 02
Review & Manage Project	Varies	286	\$28,863	30 Sep 02

Total	18 Dec 01 – 30 Oct 02	3314	\$314,669	30 Oct 02
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Element Four (Urban Stormwater):				
Deliverable or Milestone	Time Frame	Est Hours of Effort	Cost	Date Of Completion
Manage project, Prepare for and attend Team meetings, various locations	28 Feb – 26 Apr 02	0	Included in Sewer	26 Apr 02
Collect data, Kick-off meeting (Big Picture Meeting)	28 Feb – 28 Mar 02	186	\$17,000	28 Mar 02
Draft Technical Project Management Plan	28 Mar – 15 Apr 02	55	\$5,000	15 Apr 02
Geographic stakeholder meetings/SAG Review	15-23 Apr 02	110	\$10,000	23 Apr 02
Dft Final Technical Project Management Plan	23-26 Apr 02	55	\$5,000	26 Apr 02
Total	28 Feb – 26 Apr 02	406	\$37,000	26 Apr 02

Element Five (Stream Erosion)				
Deliverable or Milestone	Time Frame	Est Hours of Effort	Cost	Date Of Completion
Task 1: Analysis of historic sediment and nutrient loads	18 Jun – 15 Nov 02	500	\$30,000	15 Nov 02
Sub-Task 2 Conduct Field Work	3 Sep – 15 Nov 02	1600	\$70,000	15 Nov 02
Sub-Task 3: Determine a bulk loading number for individual streams and sediment loading for modeled watersheds	18 Nov – 28 Feb 02	2200	\$87,000	28 Feb 02
Sub-Task 4: Specify methodology	3-28 Mar 02	150	\$19,000	28 Mar 02
Sub-Task 5: Prioritizing restoration and future data and research projects	31 Mar – 25 Apr 02	150	\$19,000	25 Apr 03
Sub-Task 6: Draft Technical Report	31 Mar – 30 May 02	300	\$26,000	30 May 03
Sub-Task 7: Final Technical Report	1 Jul – 15 Aug 03	150	\$5,000	15 Aug 03

Total	3 Mar 02 – 15 Aug 03	5050	\$256,000 NOTE 1	15 Aug 03
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Note 1 The total for this project element includes more than total contribution for Sacramento District. See Table below.

Stream Erosion Funding Contributions			
Contributor	FY02	FY03	FY04
Corps of Engineers, Sacramento District	\$55,000	\$145,000	
Corps of Engineers, Engineering Research and Development Center	\$15,000	TBD	
USDA National Sedimentation Laboratory	\$13,000	\$24,000	

7. Assumptions

Common to All Elements:

-All data collection to be included in reports will be in a format consistent with the requirements of the Tahoe Integrated Information Management System (TIIMS).

-A review of scientific products will be conducted by the Lake Tahoe Science Advisory Group (SAG) on behalf of Basin Partners.

- District Independent Technical Review will be limited to areas of expertise outside of the SAG.

7.1 Element One (Framework for Implementing Activities):

- Summary Real Estate Appendix covering basic rules of engagement for future execution.

- Summary Engineering Appendix covering basic rules of engagement for future execution.

7.2 Element Two (Groundwater):

- Various stakeholders already have existing well and nutrient concentration data compiled into either a database or spreadsheet format. Most of the data compilation is assumed to be gathering various stakeholder information into a uniform system.

- There is expected to be minimal data that has not yet been compiled electronically.

- The data needed to complete the study as scoped exists and is accessible.

- Available data is manageable.

- A GIS system has been developed with basic information such as topographic maps of Lake Tahoe, orthophotographs, county boundaries, watershed boundaries, etc.
- The information collected can be added to the current GIS as additional layers.
- There is a potential groundwater problem. The extent of the problem is unknown at this time.

7.3 Element Three (Wastewater Line Risk Evaluation):

- The Utility Districts will provide access to facilities for inspection.
- The Utility Districts will provide access to system maps and data, including construction drawings and/or as-built drawings, inspection data, and previous study reports.
- A base map that is suitable for development into a project area map is available in digital format from the project stakeholders or the USGS.

7.4 Element Four (Urban Storm Water):

- The Urban Storm Water study will build upon work completed by others.
- The Urban Storm Water study will be conducted for the entire basin, even though specific geographic constraints will steer portions of the study.

7.5 Element Five (Stream Erosion):

- Various stakeholders already have sediment load and nutrient data compiled for several streams in either a database or spreadsheet format.
- There is expected to be minimal data that has not yet been compiled electronically.
- The data needed to complete the study as scoped exists and is accessible.
- A GIS system has been developed with basic information such as topographic maps of Lake Tahoe, orthophotographs, county boundaries, watershed boundaries, etc.
- The information collected can be added to the current GIS as additional layers.

8. Risks

Common to All Elements:

- Dilution of LPP needs to fund Corps process not recognized as value added.
- Corps HQ rejects framework concept.
- ASA (CW) rejects framework concept.
- FY03 & FY04 appropriations fail to meet PMP expectations.

8.1 Element One (Framework for Implementing Activities):

- Other Federal Agencies object to Corps listing potential projects for their execution.
- Mission elements of water quality, fisheries, recreation, and wildlife do not fit identified Corps primary missions of navigation, flood, and ecosystem restoration.

8.2 Element Two (Groundwater):

- The risk that enough data gaps will exist that only extremely broad evaluations can be achieved.
- The risk that the format of the data collected will not be fully compatible with the TRPA database, TIIMS. TIIMS is in the early stages of development and the Corps will establish its own format in consultation with the TIIMS contacts.
- The risk that there is no established GIS system requiring additional effort (data input, database management, etc.) to adequately establish this system to meet the data presentation needs. This extra effort could require additional time, funding or change in scope.
- The risk that the data available is so extensive that additional time and funding will be needed to gather and compile it all.
- There is a risk that the type of data needed to evaluate groundwater flow, hydraulic gradient or risk does not exist and would not be obtainable without additional fieldwork and/or sample collection.
- 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.

8.3 Element Three (Wastewater Line Risk Evaluation):

- The risk that sufficient data to evaluate qualitative levels of risk will not be readily available from project stakeholders and additional time will be required to gather and compile it.
- The risk that some facilities slated for visual inspection will not be accessible due to weather conditions, necessitating an extension of the period scheduled for inspections. This could, in turn, impact the overall project schedule.
- The risk that some facilities slated for visual inspection will not be accessible for reasons other than weather conditions, or will be in a condition that is not sufficiently safe for a basic inspection, necessitating an increased level of effort associated with inspections.
- On the basis of the Phase 1 sewer project meeting with the contractor and stakeholders, including sewer districts, it is understood that some owners of property near the lake tend to disregard the intent of sewer easements that exist over their properties. This was indicated to be a major difficulty for the replacement, removal,

rehabilitation and/or repair of sewers in these easements and even for inspection of existing lines. Thus, there is a risk of adjacent property owner objection to visual inspection of wastewater line easements, and that easements slated for inspection may be inaccessible because of vegetation, structures or other obstructions, such that either additional effort is required for inspections and/or certain facilities will not be inspected, and remediation measures will not be assigned.

- There is a risk a suitable base map is not readily available and a new base map will be required.
- There is a risk that sufficient existing information is not available to make a planning level estimate of exfiltration, and would not be obtainable without additional fieldwork and/or investigations.

There are potential sewer-system-related risks to water quality in Lake Tahoe that are not addressed by this project. These include:

- Risks of contamination by overflows from or failures of wastewater treatment plants.
- Risks due to vandalism and/or terrorism.
- Health risks of contamination of the lake by microorganisms that may not be prevented by the measures that may be chosen to prevent nutrient contamination.
- Risks of contamination from release of wastewater from sewers outside the high-risk areas selected by the stakeholders to be addressed within the budget available for this study.

8.4 Element Four (Urban Stormwater): No specific identified risks.

8.5 Element Five (Stream Erosion): No specific identified risks.

9. Key Resource Requirements

The key resources for this study include:

Common to All Elements		
Title	Resource	Phone
Project Manager	Phillip Brozek	916-557-7630
Budget Analyst	Carolyn Meza	916-557-6822

Element One (Framework Report)		
Title	Resource	Phone
Supervisory Planner	Tom Adams	916-557-6716
Technical Team Leader	Pending Personnel Action	
Senior Planner	Scott Miner	916-557-6695
Environ. Lead	Jane Rinck	916-557-6715
Real Estate	Gary House	916-557-6789
Engineering	John High	916-557-7136
Cost Engineering	None	
C-O	Richard Gebhard	775-784-5304
Economics	None	916-557-
Collaborative Coordinator	Lori Lewis (R9EPA)	415-947-4259

Element Two (Groundwater)		
Title	Resource	Phone
Technical Team Lead	Meegan Nagy	916-557-7257
Sr. Environmental Engineer	Melissa Kieffer	916-557-7369
Sr. Geologist	Lewis Hunter	916-557-5368
GIS/Database Manager	Scott Gregory	916-557-7640
Technical Writer	Shelley Scarich	916-557-7955
Draftsman	Glenn Cox	916-557-7188

Element Three (Wastewater Line Risk Evaluation)		
Title	Resource	Phone
Program Manager	Lee Frederiksen	916-567-9900
Project Manager	Blake Johnson	916-567-9900
Senior Water Quality Specialist	Thomas Quasebarth	916-567-9900
Senior Hydraulic Engineer	Lou Regenmorter	916-567-9900
Environmental Engineer	Stefan Schuster	775-588-0201
Senior Planner	Coral Cavanagh	916-567-9900

Other key resource requirements include:

- Corps management and review by selected project staff.
- Stakeholder participation in five interactive workshops.

- Sewer district assistance to the contractor in the provision of data, provision of copies of drawings and documents, and facilitation of walking sewer lines in sewer easements on private property.

Element Four (Urban Storm Water)		
Title	Resource	Phone
Program Manager	Lee Frederiksen	916-567-9900
Project Manager	Blake Johnson	916-567-9900
Sr. Water Quality Specialist	Thomas Quasebarth	916-567-9900
Senior Hydraulic Engineer	Lou Regenmorter	916-567-9900
Environmental Engineer	Stefan Schuster	775-588-0201
Senior Planner	Coral Cavanagh	916-567-9900

Element Five (Stream Erosion)		
Title	Resource	Phone
Technical Team Lead	Melissa Kieffer	916-557-7369
Coastal & Hydraulics Laboratory	Ronnie Heath	601-634-3592
USDA National Sedimentation Lab	Dr. Andy Simmons	662-232-2918

10. Constraints

10.1 Element One (Framework for Implementing Activities): The study is limited to the funds available after completion of the other four elements and is constrained by the completion date specified in the study authorization.

10.2 Element Two (Groundwater): The study is limited by a budget of \$450,000 and a final deadline of 1 March 2003 for completion of the Final Comprehensive Groundwater Study Report. The study is also limited by the quality, quantity, and accessibility of existing information.

10.3 Element Three (Wastewater Line Risk Evaluation): The study is limited by a budget of \$300,000 and a final deadline of 30 September 2002 for completion of the Final Recommended Action Plan. The study is also limited by the quality, quantity, and accessibility of existing information.

10.4 Element Four (Urban Stormwater): The study has a short execution period in order to maximize ability to secure FY03 funding.

10.5 Element Five (Stream Erosion): The study is limited by budget and a final deadline of 15 August 2003 for completion of the Final Report. The study is also limited by the quality, quantity, and accessibility of existing information. The use of the AGNPS model to the Tahoe environment will be subject to intense scientific critique.

11. Interrelated projects:

Interrelated projects include the following:

- Completed Environmental Improvement Program (EIP) 1998.
- Completed Watershed Assessment 2000.
- Completed EIP Update 2001.
- Completed EIP Finance Plan 2001.
- Joint Corps/TRPA/CTC/USDA FS Program Management efforts (on going).
- Study of the shore zone sewer systems conducted by CDM in association with various local public utility districts.
- Study proposal for urban storm water issues are being studied by CDM.
- The Lahontan Regional Water Quality Control Board is developing the TMDLs for the Lake Tahoe Basin in coordination with contractors and other local agencies.
- TRPA is in the process of updating the Environmental Thresholds (due 2004).
- TRPA is in the process of updating the Regional Plan (due 2007).
- USDA Forest Service is updating their Land and Resource Management Plan.
- Joint Corps/TRPA/CTC/USDA FS Program Management effort.

12. Customers and Stakeholders

Common to All Elements			
Customer/ Stakeholder	Contact	Address	Phone
Federal Interagency Partnership	Phil Brozek	1325 J Street Sacramento, CA 95814	916-577-7630
Tahoe Regional Planning Agency	Carl Hasty	PO Box 1038 Zephyr Cove, NV 89448	775-588-4547 x236
Lake Tahoe	Steve Teshara	PO Box 6749	775-588-2488

Transportation and Water Quality Coalition		Stateline, NV 89449	
State of California	Harold Singer	2501 Lake Tahoe Blvd. South Lake Tahoe, CA 96150	
State of Nevada	Jim Lawrence	Dept of Conservation and Natural Resources, Division of State Lands 333 West Nye Lane, Rm 118 Carson City, NV 89706	775-687-4735

Element One (Framework for Implementing Activities):

Collaborative (members not yet identified)

Element Two (Groundwater)			
Customer/ Stakeholder	Contact	Address	Phone
Lahontan Regional Water Quality Control Board	Dave Roberts	2501 Lake Tahoe Blvd South Lake Tahoe, CA 96150	530-542-5469
Lake Tahoe Research Group	John Reuter	Department of Environmental Science and Policy University of California One Shields Avenue Davis, CA 95616-8576	530-304-1473
Tahoe Regional Planning Agency	Larry Benoit	PO Box 1038 Zephyr Cove, NV 89448	775-588-4547 x-

Element Three (Wastewater Line Risk Evaluation)			
Customer/ Stakeholder	Contact	Address	Phone
Douglas County Sewer Improvement District # 1	John Hastie, Jr	P.O. Box 578 Zephyr Cove, NV 89448	(775) 588-3558
Kingsbury General Improvement District	Candy Rohr	P.O. Box 2220 Zephyr Cove, NV 89448	(775) 588-3548
Roundhill General Improvement District	Cameron McKay	P.O. Box 976 Zephyr Cove, NV 89448	(775) 588-2571
Tahoe-Douglas Public Utility District	Janet Murphy	P.O. Box 1160 Zephyr Cove, NV 89448	(775) 588-5641
Incline Village General Improvement District	Joe Borgerding	893 Southwood Blvd. Incline Village, NV 89451	(775) 832-1341
North Tahoe Public Utility District	Leon Schegg	P.O. Box 139 Tahoe Vista, CA 96148	(530) 546-4212
South Tahoe Public	Jim Hogget	1275 Meadow Crest Dr.	(530) 544-6474

Element Three (Wastewater Line Risk Evaluation)			
Customer/ Stakeholder	Contact	Address	Phone
Utility District		South Lake Tahoe, CA 96150	
Tahoe City Public Utility District	Robert Lourey	P.O. Box 33 Tahoe City, CA 96145	(530) 583-3796
Tahoe Regional Planning Agency	Matthew Graham, Brendan Ferry	P.O. Box 1038 Zephyr Cove, NV 89448	(775) 588-4547
US EPA	Jane Freeman	Representative works at TRPA office	(775) 588-4547
Lahontan Regional Water Quality Control Board	Dave Roberts	2501 Lake Tahoe Blvd. South Lake Tahoe, CA 96150	(530) 542-5469
NV Division of Environmental Protection	Joe Maez	333 West Nye Lane Carson City, NV 89706	(775) 687-4670

Element Four (Urban Storm Water)				
Customer/ Stakeholder	Contact	Address	Phone	E-Mail
Nevada Department of Transportation	Amir Soltani Bill Gall Theresa Jones	1263 S. Carson St. Carson City, NV 89712	(775) 888-7619	asoltani@dot.state.nv.us bgall@dot.state.nv.us
California Department of Transportation	John Holder Dick Melim		(530) 229-0524	john_holder@dot.ca.gov richard_melim@dot.ca.gov
Placer County Department of Public Works	Bob Costa Rebecca Bond Peter Kraatz	870 Cabin Creek Rd. Truckee, CA 96161	(530) 889-4000 (530) 906-5179	bcosta@placer.ca.gov rbond@placer.ca.gov
Washoe County	Kimble Corbridge Dick Minto	P.O. Box 1130 Reno, NV 89512	(775) 328-2041	kcorbrid@mail.co.washoe.nv.us dminto@mail.co.washoe.nv.us
El Dorado County	Bruce Lee Steve Kooyman		(530) 573-3180	Blee@co.el-dorado.ca.us
City of South Lake Tahoe	Brad Vidro Steve Peck	1900 Lake Tahoe Blvd. South Lake Tahoe, CA 96150-6323	(530) 542-6030	speck@ci.south-lake-tahoe.ca.us
Kingsbury General Improvement	Candi Rohr	P.O. Box 2220 Zephyr Cove, NV 89448	(775) 588-3548	candi@kingsburygid.com

Element Four (Urban Storm Water)				
Customer/ Stakeholder	Contact	Address	Phone	E-Mail
District				
Roundhill General Improvement District	Cameron McKay	P.O. Box 976 Zephyr Cove, NV 89448	(775) 588- 2571	rhgid@aol.com
Tahoe Regional Planning Agency	Matt Graham Rita Whitney Brendan Ferry	P.O. Box 1038 Zephyr Cove, NV 89448	(775) 588- 4547	mgraham@trpa.org rwhitney@trpa.org bmpintern@trpa.org
US EPA	Jane Freeman	P.O. Box 1038 Zephyr Cove, NV 89448	(775) 588- 4547	jfreeman@trpa.org
Lahontan Regional Water Quality Control Board	Laurie Kemper Robert Larson Jeremy Sokulsky	2501 Lake Tahoe Blvd. South Lake Tahoe, CA 96150	(530) 542- 5463	LKemper@rb6s.swrcb.ca.gov RLarsen@rb6s.swrcb.ca.gov sokuj@rb6s.swrcb.ca.gov

Element Five (Stream Erosion)			
Customer/ Stakeholder	Contact	Address	Phone
Lahontan Regional Water Quality Control Board	Dave Roberts	2501 Lake Tahoe Blvd South Lake Tahoe, CA 96150	530-542-5469
Lake Tahoe Research Group	John Reuter	Department of Environmental Science and Policy University of California One Shields Avenue Davis, CA 95616-8576	530-304-1473
Tahoe Regional Planning Agency	Larry Benoit	PO Box 1038 Zephyr Cove, NV 89448	775-588-4547 x-

13. Reviews

Common to All Elements:

Technical elements will be responsible for internal (Quality Control) review of all products. All intermediate products, even drafts, will be reviewed internally prior to

release to stakeholders. All technical elements will execute work in accordance with their current quality control plan. All documents will be marked with an appropriate watermark or header/footer on all pages to identify the relative level of document completion. Technical team leaders will collaborate on common watermark text. Subject to this collaboration and consistent with the normal business practices of a working element, terms such as *early draft*, *review draft*, *Final Draft*, or *SAG Review Draft*, may be used.

The non-Federal sponsors have requested that technical review of scientific issues in the Lake Tahoe Basin be completed by subject matter experts associated with each respective non-Federal agency. These reviewers are respected academic, research and practicing specialists that are recognized as subject matter experts for Environmental Improvement Program issues. In larger basin-wide forums, this group is collectively referred to as the Lake Tahoe Science Advisory Group (SAG). While this technical peer review will occur under the auspices of the SAG, review comments will be from individuals and will not represent a SAG consensus or position.

Representatives of the Coalition and Basin Executives will conduct review for Basin agency specific and political sensitivity.

13.1 Element One (Framework for Implementing Activities): ITR will be conducted by Los Angeles District. A project specific quality control plan will be developed jointly for Element One between Sacramento and Los Angeles Districts.

13.2 Element Two (Groundwater): The initial review will be conducted by Environmental Design Section and the Tahoe Groundwater Study Team.

13.3 Element Three (Wastewater Line Risk Evaluation): The initial review will be conducted by independent CDM IAW internal procedures on record at the Contractor's office.

13.4 Element Four (Urban Storm Water): The initial review will be conducted by independent CDM IAW internal procedures on record at the Contractor's office.

13.5 Element Five (Stream Erosion): The initial review will be conducted as specified in quality control procedures internally by the Corps Coastal & Hydraulics Laboratory and the USDA National Sedimentation Laboratory and independent CDM IAW internal procedures on record at the Contractor's office.

15. Communication Plan: Successful execution of the Lake Tahoe Special Study will require communication and coordination both within and among the work elements, along with timely, clear exchange of information with project stakeholders.

Most communication types and methods will be **common to all work elements**, as will the common goal of effective and efficient communication that documents project activities adequately.

Documents: All documents will be produced in MS Word and, when transmitted electronically, will be in either *.doc or *.pdf format.

The Press: Any project team member approached by a member of the press shall refer them to the Corps Project Manager.

Letters and Memoranda: All correspondence will be routed through the Corps Project Manager or Work Element leaders, as appropriate.

Electronic Mail (E-mail): E-mail is an acceptable method of communication for informal correspondence. Documents may also be transmitted by e-mail, but hard copies of the final versions of all formal documents shall be mailed, unless otherwise requested by the customer.

Technical Data: The transmittal of technical data will always include a transmittal letter or explanatory e-mail. Work Element Leaders will be responsible for maintaining the repositories for all technical data, whether in hard copy or electronic format.

Meetings: Draft agendas will be prepared prior to each meeting, and copies will be distributed for comments in advance.

Conference Calls: Periodic conference calls will be convened as needed for coordination and communication among work elements and within work element teams. An agenda for conference calls will be prepared as needed and will be distributed in advance of the call by e-mail.

Meeting and Conference Call Summaries: Work Element Leaders will record a summary of decisions made in all meetings, conference calls, and other communications and furnish copies of written summaries to the Corps Project Manager. Team members are encouraged to keep their own detailed notes of meetings and conference calls. This record will be maintained in the project files.

Telephone Calls: When a telephone conversation with an outside party or with another Team member includes information that should be documented, the team member involved shall prepare a telephone call record, distribute the record to the other team members (e-mail is acceptable) and provide a hard copy of the record for the project

files.

Faxes: Fax is an acceptable method of communication for informal correspondence. The fax header shall include the date, name and phone number of the sender, the name and fax number of the receiver, the project name and number, the number of pages sent, and the names of the individuals receiving copies.

Use of Filing System: Efficient access to project information will be maintained through use of a project filing system. Team members may keep their own files, however, a copy of all communications, items, and information prepared or gathered as part of this study shall be filed in central filing system for each Work Element and copied to Corps Project Management.

Communication Plan Matrix								
	R= Review/Comment			A= Co-Author or Input				
	R/A= Review/Approval			I= Information Only				
	Stakeholders	Frame work Team	GW Team	Sewer/ Storm Team	SPD DST	PUDs/ Local/ Tech	LRWQCB TRG	SAG/ ITRT
PMP	R/A	A	A	A	I			
Monthly Update	I	I	I	I	I			
IPR	R	A, R	I	I	R/A			
Framework Scope	A, R/A	R/A	I	I	A			
Framework Document	R, R/A	A			R			
GW Scope & Tech PMP	I		A	I			A	
Sewer Scope & Tech PMP	I		I	A		A		
GW Dft Tech Report	I		A	R		R	R	R
GW Final Tech Report	I		A	I		I	R/A	R
Sewer Dft Tech Report	I		R	A		R	R	R
Sewer Final Tech Report	I		I	A		I	R/AI	

16. Change Management Plan

A fundamental element of change management will be comparison of % project completion compared to % contingency expenditure.

Minor changes are those changes that are internal to an existing sub-element schedule, scope or budget and do not affect end dates. The technical team leader will handle these minor changes. The project manager will be notified of any minor changes through email. Examples of minor changes in scope are considered:

- Minor cost increases (\$0 to \$2,000) only if funds are available in previously identified or assigned contingency funding. (EXCEPTION: Formally contracted work must be authorized by the Contracting Officer);
- Minor schedule adjustments (1 week or less) that do not affect the final report date; and
- Process changes that do not affect overall scope or deliverable.

Intermediate changes are those changes that are may require minor adjustment of scope, schedule or budget. Intermediate changes may or may not affect end dates or other products. The technical team leader will propose these changes to the project manager for approval and funding.

The project manager will handle major changes. The technical team leader will inform the project manager of any requested major changes and request action and/or a decision. Examples of major changes are considered:

- Cost increases in excess of \$2,000;
- Major schedule adjustments (greater than 1 week) that could effect major milestones or the final report date;
- Modifications to types of deliverables; and
- Changes in overall scope.

17. Financial/Budget Analysis: See Attachment

18. Schedule MS Project: See MS Project Attachment

Incorporated By Reference:

Groundwater Scope of Work

Risk Evaluation Scope of Work and Urban Storm Water Scope of Work

Stream Erosion Scope of Work