



Lake Tahoe Basin Framework Implementation Report

Draft Summary

April 2004

Carved by glaciers and fed by 63 tributaries, Lake Tahoe is a natural jewel whose cobalt-blue waters are world-renowned for its fathoms-deep transparency. Lake Tahoe's transparency serves not only as a barometer to its health, but also the overall wellness of the Lake Tahoe Basin, a 519 square mile watershed formed by the jagged granite peaks of the Sierra Nevada Mountains. It is from this watershed that water clarity is improved and damaged, as sediment, pollutants and other influences drain, fall and seep into the lake.

Since the late 1960's, a series of studies have documented that Lake Tahoe is gradually losing its luster as a series of natural and man-made factors in recent decades have combined to degrade its crystalline waters and threaten its future. The factors that contribute to the harm and health of Lake Tahoe are as dynamic as they are complex, with a range that includes environmental, social, economic, scientific, interagency and political factors and influences.



A 1997 study by the Tahoe Research Group at the University of California, Davis, for example, reported that clarity in Lake Tahoe had declined 33 feet since

measurements were first taken in 1968. Study authors cited five decades of human development in the Tahoe Basin as the leading

culprit of declining water quality, a consequence of increased nutrient load from streams, atmosphere and groundwater with steadily increasing algal growth (eutrophication). If no action is taken, the authors concluded, the lake could lose its cobalt-blue color by 2030^a.

Lake Tahoe

Elevation:	6,229
Lake Depth:	1,645 feet
Surface Acres:	193 square miles
Capacity:	122.2 million acre feet
Shoreline:	71 miles
Annual Precipitation:	30 inches

Lake Tahoe Basin (1)

Year-round population:	56,169
Annual visitor days:	17.6 million
Average Daily Traffic: (in vehicles)	80,552

Top 5 Employers (1)

Lodging/Gaming	12,712
Finance, insurance, real estate	4,807
Recreation	4,708
Retail Trade	4,649
Government	4,057
Total Jobs:	49,513

1: Source: TRPA 2001: Thresholds Evaluation

^a Lake Tahoe: Moving Beyond the Conflict, by Charles R. Goldman, PhD & John E. Reuter, PhD Tahoe Research Group, UCD, 1997. A 2001 measurement indicated lake clarity had improved to 73.6 feet, 28.8 feet less than that recorded in 1968. Although some improvement was attributed to Tahoe Basin restoration activities, no conclusions were offered as 2001 was a drought year, which reduced runoff. In contrast, the worst recent year for lake clarity, 1997, was a flood year with increased runoff.

Overall, the Federal agencies operating in the Tahoe Basin have successfully implemented individual, site-specific projects of the Environmental Improvement Program (EIP), a coordinated local, regional, state and Federal clearinghouse that includes capital projects; research and scientific activities; program support and technical assistance; and operations and maintenance activities. Through completion of these individual restoration projects, Federal agencies have incrementally improved environmental conditions that affect Lake Tahoe water quality. Dialogue with Federal agencies revealed that although many entities operating in the Tahoe Basin carry forward a common purpose – restoration and preservation of this national asset – none have a well-defined approach for implementing multi-agency, multi-jurisdictional projects. Dialogue with Federal agencies revealed that although many entities operating in the Tahoe Basin have a common purpose approaches to project implementation are primarily a function of policy and management styles that limit the ability of Federal agencies to relinquish their EIP responsibilities, while maintaining accountability to their agency mission, mandate and authority. Such divergent approaches are both a strength and weakness when considering the challenges facing the region. Moreover, such divergence is not unique as the same could be said for many environmental preservation and restoration programs in the United States that include the activities of multiple agencies and their inherent cultures.



The Lake Tahoe Basin Framework Implementation Study (Framework Study) is a watershed study designed to clarify and synthesize decades-old challenges for Federal agencies to accomplish basin-wide, programmatic implementation of the EIP and place these challenges in the context of today’s political, social and natural environment. Technical evaluations aimed at defining baseline information needed to supplement and justify environmental threshold standards for the Tahoe Basin were also conducted by the U.S. Army Corps of Engineers (Corps) as part of the Framework Study. Results of the Framework Study are intended for development and implementation of enhancements to the authorities, missions, mandates, policies and procedures of Federal agencies in the region that, if acted upon, would contribute to resolving these historical hurdles. The Framework Study and the resulting “Lake Tahoe Framework Implementation Report” (Framework Report) present these enhancements for consideration by Congress, Federal agency management and other interested parties.

A New Direction

Until now, all Federal agencies have received funding from a wide array of sources which, together, means that Federal agencies as a whole receive funding from dozens of sources each year. Much of this funding has historically been provided through appropriation earmarks which are inherently uncertain. Implementation of the EIP has been hindered by this lack of consistent and adequate funding to implement restoration projects on a programmatic level.

Today, a combination of Congressional interest, local involvement and new legislation has brought about a new direction in the Tahoe Basin. Leading this new direction was the amendment of the Southern Nevada Public Land Management Act (SNPLMA) of 1998 (P.L. 105-363) in 2003. Authored by



Senator John Ensign (R-Nev.) and co-sponsored by Senator Harry Reid (D-Nev.), the 2003 amendment to SNPLMA is unique in that it provides for a single source of funding that is available to multiple Federal agencies that enter into a cooperative agreement with the U.S. Department of Agriculture.

The SNPLMA Amendment provides approximately \$37.5 million per year – until a maximum of \$300 million is approved – of new, reliable and dedicated funding to the Tahoe Basin for restoration activities of the EIP by Federal agencies. In approving the amendment, Congress required development of an EIP project nomination and selection process to be formally approved by the SNPLMA Executive Committee. This requirement created a new baseline for how Tahoe Basin-specific projects are identified, funded and monitored.

About The Framework Study

The Framework Study was initiated by the Corps following approval by Congress of the 2002 Energy and Water Development Appropriations Act, which stated that “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 the environmental quality of the Tahoe Basin and the Secretary shall submit a feasibility level report within 30 months of enactment of this Act.”



As a summary of the Framework Report, this document does not represent an agency position or serve as a decision document under the Federal process. Rather, the Framework Report and this summary provides a range of enhancements developed through a collaborative environment where Tahoe Basin stakeholders were engaged in an agency-evaluation process focused on realizing opportunities for successful basin-wide, programmatic implementation of the EIP. The enhancements presented in the Framework Report are provided as forward-thinking concepts for consideration by Congress, Federal agency managers and other interested parties, and, if carried forward, will require further consideration to identify and analyze the potential implications of implementing a comprehensive framework program and presenting the results in a programmatic or comprehensive document.

The Framework Study featured active participation by local, regional, state and Federal agencies, along with environmental and business interests from the private sector (collectively, “stakeholders”), replete with their individual missions, mandates, authorities and management styles. Through an iterative



process, the Corps’ project study team (study team) and stakeholders developed and/or identified a range of objectives and opportunities for resolving historical issues and impediments to basin-wide Federal EIP implementation. Through this forum, the study team and stakeholders identified a range of example measures ultimately used by the stakeholder team (that is, the Lake Tahoe Transportation and Water Quality Coalition (Coalition) and its invited participants) to develop the proposed enhancements to the missions, mandates and authorities of Federal agencies operating in the Tahoe Basin. These enhancements are a foundation for a

comprehensive approach to resolution of many issues and impediments that have been present for three decades. The study team and local stakeholder team recognized that these enhancements are vital developments to success in the Tahoe Basin because the infusion of Federal funding via the SNPLMA Amendment – though a positive development for the region – does not resolve all the historical issues and impediments to EIP implementation.

It should be recognized that the enhancements were generated within the constraints of the Framework Study; that is schedule and budget, and as such, the breadth and depth of each enhancement varies from agency to agency and concept to concept. Each measure and enhancement is fully described in the Framework Report, is available at <http://www.spk.usace.army.mil/>.

Relevant pertinent historical reports and studies considered for the Framework Study:

- *The Lake Tahoe Study*, USEPA, 1974
- *Federal Policy for the Lake Tahoe Basin*, USFS and 11 Federal agencies, with assistance from the states of California and Nevada, and TRPA, 1978
- *The Role of the USFS and Other Federal Agencies in the Lake Tahoe Region*, USFS, Region 5, 1979
- *Lake Tahoe Environmental Assessment*, Western Federal Regional Council, 1979
- *The Lake Tahoe Basin Water Quality Plan*, California TRPA, 1980
- *Reaching Consensus on Environmental Thresholds and a Carrying Capacity for the Lake Tahoe Basin*, Tahoe Federal Coordinating Council, 1981
- *TRPA Regional Plan*, TRPA, 1986
- *The Lake Tahoe Basin Management Unit Forest Plan*, USFS, 1988
- *TRPA Regional Plan Update*, TRPA, 1991
- *Water Quality Control Plan for the Lahontan Region*, Lahontan RWQCB, 1994
- *Focused Action Plan – EIP*, TRPA, 1998
- *The Evolution of Collaboration*, TRPA, 2000
- *Lake Tahoe Watershed Assessment Report*, USFS, Pacific Southwest Research Station, 2001
- *Evaluation of Constraints Affecting Implementation of the EIP*, Corps in cooperation with TRPA, 2001
- *2001 Threshold Evaluation*, TRPA, 2002
- *Report to the Federal Interagency Partnership: Best Practices in Collaboration and Group Process Design*, Federal Interagency Partnership by Harriet Goldman & Associates, 2002
- *Stakeholder Belief Change in the Lake Tahoe Basin*, USFS Pacific Southwest Research Station by the UC Davis Center for Environmental Conflict Analysis, 2003
- *Program Management and Coordination Plan for the EIP*, TRPA and LTBEAC by the Tahoe Management Services Team, 2003
- *LTBEAC Annual and Mid-Year Progress Reports*, LTBEAC, on-going

Framework Study Participants

The Framework Study featured active participation by stakeholders, as defined above. In addition, a number of organizing entities were consulted, such as the Lake Tahoe Federal Advisory Committee (LTFAC), the Coalition, the Tahoe Regional Executives Committee (TREC) and the Lake Tahoe Basin Executives Committee (LTBEAC). These groups represent a broad range of interests and expertise valuable for development of enhancements for the Framework Study. Agencies and organizations that were invited to participate are discussed in the Framework Report and include:



- California Ski Industry Association
- California Tahoe Conservancy
- Federal Highway Administration
- Federal Housing and Urban Development
- Lahontan Regional Water Quality Control Board
- League to Save Lake Tahoe
- Natural Resources Conservation Service
- Nevada Division of State Lands
- North Lake Tahoe Resort Association
- Tahoe Regional Planning Agency
- Truckee-North Tahoe Transportation Management Association
- U.S. Army Corps of Engineers
- U.S. Bureau of Reclamation
- U.S. Department of Housing and Urban Development
- U.S. Environmental Protection Agency
- U.S. Fish and Wildlife Service
- U.S. Forest Service
- U.S. Geological Survey
- Washoe Tribe of Nevada and California

Accomplishments of the Framework Study

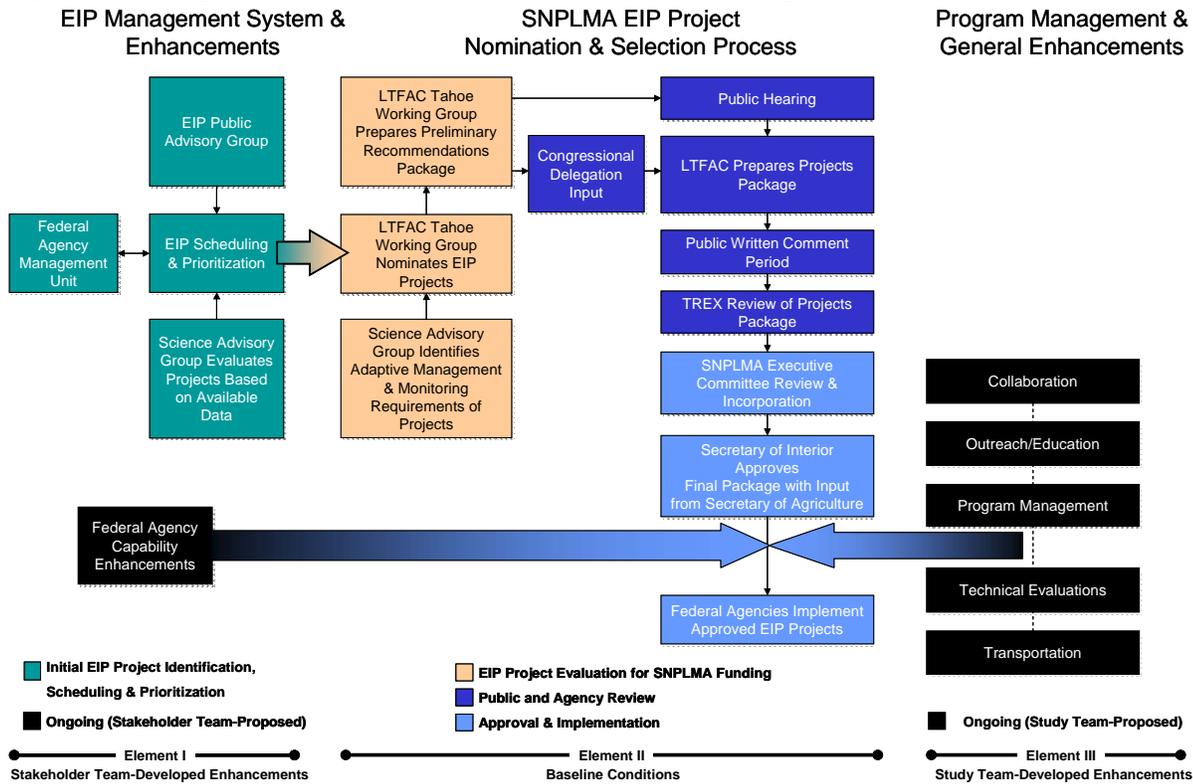
During development of the Framework Study and Framework Report, three distinct elements emerged that when considered collectively represent a comprehensive approach to basin-wide, programmatic implementation of the EIP. These elements are interdependent and, to realize the highest benefit for the Tahoe Basin, each should not be acted upon exclusive of the other. As such, these elements serve as a framework of enhancements that address historical hurdles for the Tahoe Basin. The elements include:



- Element I: EIP Management and Federal Agency Capability Enhancements (Chapter 5.0, Framework Report)
- Element II: Baseline Conditions, SNPLMA EIP Project Nomination and Selection Process (Chapter 3.0, Framework Report)
- Element III: Program Management and General Enhancements (Chapter 6.0, Framework Report)

While Elements I and III contain enhancements specific to individual agencies or existing Tahoe Basin management practices, Element II represents a project nomination and selection process required by the SNPLMA Amendment. Element II was developed by the stakeholder team, that is the Coalition and its invited participants. Through these enhancements, the stakeholder team and the study team believe Federal agencies will have the tools and resources necessary to realize the objectives developed during the Framework Study and opportunities provided by the SNPLMA Amendment. See Figure 1 for an outline of the proposed Comprehensive Framework for Federal EIP Implementation.

Figure 1. Comprehensive Framework for Federal EIP Implementation



Element II, Baseline Conditions, SNPLMA EIP Project Nomination and Selection Process

Element I, EIP Management System and Enhancements and Element III, Program Management and General Enhancements must be considered within the context of Element II, SNPLMA EIP Project Nomination and Selection Process developed as a part of the implementation agreement for SNPLMA funding for the Tahoe Basin. Accepted by the SNPLMA Executive Committee in February 2004, the draft implementation agreement is a locally developed nomination and selection process for Federal EIP projects in the Tahoe Basin (see Appendix D, Framework Report).

The agreement was developed with assistance by the study team – through multiple meetings – with the stakeholder team. The agreement is a local, state and Federal partnership, whereby, Federal EIP projects in the Tahoe Basin are nominated and selected. The process is supported by the Lake Tahoe Science Advisory Group through evaluation of projects, based on available data. The process also includes multiple opportunities for public participation. See Figure 1, Element II for an outline of the SNPLMA Amendment EIP Project Nomination and Selection Process. For complete text of the stakeholder team-developed process see Appendix D of the Framework Report.

Key Legislation:

- 1969 Tahoe Regional Planning Compact and 1980 Amendment
- 1980 Santini-Burton Act
- Executive Order 13057 – *Federal Interagency Partnership*
- 1998 Southern Nevada Public Land Management Act (SNPLMA)
- 1999 Lake Tahoe Restoration Act
- 2003 Amendment SNPLMA of 1998 (P.L. 105-363).

Element I, EIP Management and Federal Agency Capability Enhancements

The stakeholder team developed two types of enhancements to ensure successful implementation of EIP projects using SNPLMA funds (that is, management and Federal agency capability enhancements). Each enhancement type complements the baseline conditions as presented by the SNPLMA Amendment and EIP Project Nomination and Selection Process (Element II). The enhancements further serve as solutions to historical issues and impediments to Federal EIP implementation and function as actions that fulfill voids in the Federal process not resolved by SNPLMA.



Stakeholder team-developed enhancements include:

- Development of a Federal Agency Management Unit (FAMU) for Federal EIP management.
- Development of program clarifications, expanded and new authorities for Federal agencies working in the Tahoe Basin

Federal Agency EIP Management Unit

There are no fewer than eight Federal agencies with EIP responsibilities, each with their own programs, capabilities, opportunities and capacities.

Presently, there is no formal organization or mechanism to ensure that all Federal EIP projects are integrated and coordinated in a programmatic manner that provides the most cost-effective use of the available funds. Divergent approaches among Federal agencies are primarily a function of individual agency rules and management styles that limit the ability of Federal agencies to relinquish their EIP responsibilities, while maintaining accountability to their agency mission, mandate and authority. Therefore, a management mechanism is required that coordinates the activities of all federal agencies while respecting their need to be accountable to their departments.



It is essential that a management unit be established that meets the objectives and basic implementing measures that key Federal agencies identified as part of the Framework Study (see Framework Report, Appendix D). Development of the FAMU and other associated components is necessary to implement the Federal EIP Management System. This management system is designed to organize, prioritize, and schedule all Federal agencies' EIP projects based on a variety of factors including agency capacities and authorities, as well as potential opportunities to consolidate similar projects. One of the principal goals of the FAMU is to ensure that projects nominated in the SNPLMA process for the Tahoe Basin have been thoroughly analyzed and prioritized prior to consideration. The FAMU would be operated as a partnership among Tahoe Regional Planning Agency (TRPA) and Federal agencies wishing to participate in implementing EIP projects.

Program Clarifications and Expanded and New Authorities

As part of its ongoing effort to raise key state and Federal issues that are important to Lake Tahoe, the stakeholder team identified a number of legislative improvements that would help realize objectives developed during the Framework Study process (see Framework Report, Section 4.1), opportunities provided by the SNPLMA Amendment and enhancements of agency capabilities. These program clarifications and expanded and new authorities will be required for the Corps, the U.S. Department of Transportation (USDOT), U.S. Environmental Protection Agency (USEPA), U.S. Bureau of Reclamation (Reclamation), and U.S. Forest Service (USFS). Program clarification and authority modification is limited to basin-specific areas that the stakeholder team believe would benefit from EIP implementation. The basin-specific enhancements described below are not without precedent. Examples of similar enhancements approved elsewhere in the nation include those for Federal agencies operating in the Chesapeake Bay (<http://www.nab.usace.army.mil/ChesapeakeBay>). These enhancements are summarized below.



U.S. Army Corps of Engineers (Corps)	
Enhancement	Result
Provide authority for the Corps’ Sacramento District to enter into non-standard cost-sharing agreements under the Truckee River and Tributaries Project; California and Nevada, Resolution by the Committee on Environment and Public Works of the United States	Improves the Corps ability to be responsive to the needs of local agencies for Tahoe-specific EIP projects.
Provide funding, work-in-kind enhancements, and flexibility in cost-sharing agreement (that is, local authority for changes) to the existing Section 211, Water Resources Development Act (WRDA) 99, (amends Section 503, WRDA 96) Watershed Management, Restoration, and Development and Environmental Infrastructure; Section 502, WRDA 99 (amends Section 219, WRDA 92).	Amends stringent work-in-kind requirements and incompatible cost-share agreements which have become barriers to establishing partnerships with local agencies for Tahoe-specific EIP projects.
Allow for fenced, or dedicated, funding within Section 595 of WRDA 1999 for EIP implementation.	Improves the Corps ability to compete, and therefore commit to partnerships with local agencies, for funding for state-wide projects.
Designate funding under Section 203 of WRDA 2000 for EIP implementation with sovereign nations operating in the Tahoe Basin.	Allows the Corps to seek partnerships with the Washoe Tribe of Nevada and California for implementation of EIP projects.
Authorize the Secretary of Army permission to use SNPLMA funds for executing the Federal share of restoration projects in the Tahoe Basin in the form of grants, reimbursements including reasonable costs of project initiation, or through local cooperation agreements with non-Federal partners.	Provides the Corps with clear guidance concerning execution of work at Lake Tahoe using SNPLMA funds, thereby, improving the Corps level of service. The Economy Act (31 USC 1535) limits Corps involvement to work with Corps staff or by contract, but not use grants, reimbursements or interagency agreements.

U.S. Environmental Protection Agency (USEPA)	
Enhancement	Result
Direct the USEPA to allow TRPA to participate in the Clean Water Act, Section 106 Grant Program, Funding for Interstate Compact Commission, contingent upon meeting program criteria.	Resolves artificial barrier to TRPA funding, an agency eligible for the program but removed from consideration because it did not apply within the 120-day application period in 1972.
Provide guidance to USEPA that the SNPLMA implementation agreement for EIP projects in Tahoe be exempt from usual project competition requirements.	Allows EPA to become a full partner in SNPLMA through resolution of conflicting grant funding competition requirements.

U.S. Bureau of Reclamation (Reclamation)	
Enhancement	Result
Provide a statutory definition to the Lake Tahoe Regional Wetland Development Program (Fish and Wildlife Coordination Act of 1934) that clarifies how funds may be used for program needs in the Tahoe Basin.	Enables coordinated program management for implementation of fish, water quality, wildlife, riparian areas, vegetation and lake habitat projects into a cohesive, cross-agency framework for timely implementation of Tahoe-specific projects funded through SNPLMA and future (as yet unidentified) Congressional appropriations.

U.S. Department of Transportation (USDOT)	
Enhancement	Result
Clarify the authority of USDOT to set aside one percent of Public Lands Highway funds to conduct project-specific activities, including project planning, environmental studies, preliminary design, and construction.*	Establishes USDOT as an active proponent of EIP project implementation beyond the SNPLMA process and its current role as a pass-through agency for Federal funds to the States of California and Nevada.
Allow the Tahoe Metropolitan Planning Organization (TMPO) to expend one percent of allocated funding on operation and maintenance costs associated with transit projects.	Designates the TMPO as responsible for operation and maintenance of transit projects, therefore extending the operational life of the projects.

* Included in pending House and Senate transportation reauthorization bills (HR 3550 and S 1072).

U.S. Forest Service (USFS)	
Enhancement	Result
Direct USFS to establish staff for transit programs, perhaps in the form of a detailee from the National Park Service via Inter-governmental Personnel Agreements and Transfer Capabilities, and allow for SNPLMA and other funding sources to be used for operation and maintenance.	Establishes a transit program expertise and operational funding for an effective transportation system in the Lake Tahoe Basin Management Unit.
Designate the Tahoe Basin as the “Lake Tahoe National Scenic and Recreation Area” in lieu of the “Lake Tahoe Basin Management Unit.”	Elevates the status of the Tahoe Basin to national decision-makers and provides additional opportunities to promote the region internationally.
Provide authority under the SNPLMA Amendment to use these funds for administration of SNPLMA.	Provides a source to fund efficient and effective administration of SNPLMA in Tahoe.

U.S. Forest Service (USFS)	
Enhancement	Result
Renew charter of the Lake Tahoe Basin Federal Advisory Committee and amend its mission to participate in the SNPLMA project nomination and selection process.	Facilitates SNPLMA in accordance with the Federal Advisory Committee Act.

Basin-Wide Enhancements	
Enhancement	Result
Authorize the use of SNPLMA funds to establish a Federal Agency Management Unit with neutral/non-aligned staff for programmatic management of the Federal portion of the EIP.	Assists in coordinated and cost-effective implementation of all Federal EIP projects through establishment of neutral staff to coordinate the Federal portion of the EIP and to prioritize and schedule projects nominated for SNPLMA funds.
Encourage applicable Federal agencies in Tahoe to participate, where appropriate, in the Federal Agency Management Unit.	Ensures the best use of public funds through securing Integrated and, coordinated implementation of the EIP.

Element III, Program Management and General Enhancements

The study team recognized the need for and developed several other proposed enhancements in addition to those developed by the stakeholder team. These study team enhancements focused on more long-term, broader concepts that build upon Elements I and II, such as formal collaboration, outreach/education, and program management. These enhancements were developed for the purposes of facilitating development of a structure that supports the most efficient and effective implementation policies. The study team also developed specific enhancements related to the four technical evaluations and transportation-related issues. These evaluations are summarized below with their respective findings and study team enhancements.



Formal Collaboration

Pathway 2007 is a combined effort to integrate the regional planning efforts of the USFS, TRPA, Lahontan Regional Water Quality Control Board (RWQCB), and the Nevada Division of Environmental Protection (NDEP). Scheduled for completion in 2007, this coordinated regional planning effort will have a fundamental impact on virtually all activity within the Tahoe Basin for the next 20 years. The planning effort includes:

- USFS Land and Resource Management Plan Revision
- TRPA Regional Plan Update
- Lahontan RWQCB and NDEP Lake Tahoe Total Maximum Daily Load Process Study

Because of its broad spectrum influence on the Tahoe Basin, the Pathway 2007 process was selected by the study team for development of a feasibility assessment report to evaluate whether Tahoe Basin

stakeholders could make constructive use of a formal collaborative process in setting public policy. The assessment sought to clarify issues, conditions, trends, goals and stakeholder views as well as an appropriate design of a formal collaborative process. The study included detailed interviews with nearly 50 major decision makers.

Findings: The feasibility assessment report concluded that current conditions are not favorable to immediately initiate a collaborative process in the Tahoe Basin unless stakeholders make fundamental cultural and process changes. These changes include: (1) be self-reflective so as to acknowledge their collaborative limits, (2) grow beyond these limitations, and (3) provide the fiscal and temporal resources to change these limitations. Despite these conclusions, stakeholders believe the future lies within a collaborative process that involves agencies and the public.

Study Team-Developed Enhancement:

- Congressional funding and support for formal collaborative regional planning; commitment by local, regional, state and Federal agencies to formal collaboration.

Outreach/Education

A common thread evident during the Framework Study process was the need to evaluate existing and potential outreach and education programs to facilitate EIP implementation. Common among local stakeholders is a belief in the value this activity provides in maintaining public awareness of EIP projects, and, therefore, ensuring successful project completion. And just as each Federal agency has its own institutional approach to environmental stewardship of the Tahoe Basin, each also has its own institutional application of community outreach and education in EIP project implementation. Widespread communication of EIP projects across local, regional, state and Federal agencies operating in the Tahoe Basin varies by agency. Factors that influence community outreach and education programs in support of EIP projects range from funding to project management decisions to available staffing.



Findings: Members of a Basin Executives subcommittee and several LTFAC members note that beyond project-based outreach and education, a programmatic or coordinated approach is missing for basin-wide EIP efforts. This need was recognized in a study completed by CH2M-Hill and Parsons for TRPA, USFS, California Tahoe Conservancy (CTC) and the Corps. See Table 6, of the Framework Report for examples of outreach and education opportunities as identified during the Framework Study.

Study Team-Developed Enhancements:

- Outreach and education should become a standard project cost for appropriate EIP projects.
- Establish a program management outreach and education fund for agency-wide EIP implementation activities.



Program Management

The SNPLMA EIP Project Nomination and Selection Process (Element II), as well as creation of FAMU (as part of Element I), has presented a new system for program management in the Tahoe Basin. This system, however, is not defined and its form and function will depend on the authority, mission and mandate of Federal agencies applying for SNPLMA funds. Although the FAMU is one component of the overall project management structure, it will be up to each agency to clearly describe what

program management involves and what role is proposed for their individual agency. Additionally, a quantification of the benefit-to-cost ratio of program management must be determined. The success of future Tahoe Basin program management rests on this.

Study Team-Developed Enhancement:

- Use SNPLMA funds for program management of EIP projects through planning, design, and construction to improve Federal agency accountability in meeting environmental thresholds.

Transportation

Transportation efforts in the Tahoe Basin involve a large number of agencies, boards, coalitions, divisions and organizations dedicated solely to the successful implementation of a comprehensive transportation plan. Yet, difficulty in project implementation due to lack of funding and a project champion is a reality. Consideration of transportation issues by the study team was limited to an understanding of the issues and enhancements that could be addressed with regard to EIP implementation. Issues considered were developed through meetings with members of LTFAC, USFS, TRPA, USEPA, California Department of Transportation (CalTrans), North Lake Tahoe Resort Association (NRLTA), and others.



Findings: Three significant issues were identified: (1) pass-through of Federal funds to state entities creates a disconnect between Federal responsibility and EIP implementation, (2) Federal criteria to receive metropolitan planning organization funding are based on resident population, not traffic flows; and (3) lack of transportation-specific components in the EIP and environmental thresholds, thereby transportation projects are not competitive with other EIP projects.

Study Team-Developed Enhancements:

- Develop a transportation-based Environmental Threshold Carrying Capacity (ETCC).
 - Accurately list transportation projects under new threshold category and determine attainment criteria.
 - Maintain Tahoe Transportation District, LTFAC, Tahoe Metropolitan Planning Organization (TMPO) and Federal Highway Administration (FHWA) coordination activities to develop Federal transportation project champions.
 - Modify Federal transit and transportation funding criteria, including TMPO funding, to be based on visitor and resident population of the area.



Technical Evaluations

Risk Evaluation and Corrective Action Plan for Shore Zone Wastewater Lines

The purpose of the risk evaluation for shorezone wastewater lines was to determine the potential effect the wastewater facilities within the Tahoe Basin, especially in the shore zone, have on the nutrient load of Lake Tahoe. The evaluation provides a quantified estimate of exfiltration (leakage) from wastewater collection systems within the Tahoe Basin, and a qualitative assessment of risk from overflows/releases from the wastewater collection system in the shore zone and sensitive stream environmental zones on the lake.



The evaluation applied best engineering judgment to existing data and assumptions. The evaluation concluded that about 0.42 percent and 1.0 percent of the total annual nutrient budget for nitrogen and phosphorus, respectively, for the lake was contributed from expected exfiltration during normal operations. The magnitude of this contribution will be utilized in helping to set the relative priority on infrastructure replacement and rehabilitation. The evaluation also performed a risk assessment of overflows/releases from the wastewater collection system. Critical sewer facilities were identified and categorized based on the potential magnitude of the effects to Lake Tahoe should an overflow/release occur. Qualitative risk levels were established for the critical sewer facilities along with priority levels for the high and medium risk facilities. Draft risk reduction action plans were also developed.



The risk assessment concluded that while minor spills continue to occur, catastrophic spills have not been reported in years. This enviable record is probably due to a heightened level of preventative maintenance, which is at least partly due to the strict regulatory environment. However, wastewater systems are aging to the point where wastewater districts will be faced with increasingly costly preventative maintenance or initiation of a comprehensive capital

replacement/rehabilitation plan. The sub-study recommends that any major capital replacement/rehabilitation plan be initiated soon and be spread over 15 to 20 years such that it can be accomplished in a manner so as to avoid a huge short term capital expenditure and associated calamitous effect on community quality of life

Study Team-Developed Enhancement:

- Draft and implement a capital replacement/rehabilitation plan, on the scale of the EIP, for wastewater system infrastructure.

Groundwater Evaluation

The purpose of the groundwater evaluation was to enhance the understanding groundwater plays in the eutrophication processes that reduce the clarity of Lake Tahoe. The groundwater evaluation estimated the phosphorus and nitrogen nutrient loading from groundwater flowing into Lake Tahoe. The evaluation also identifies known and potential sources of phosphorus and nitrogen and nutrient reduction alternatives. The groundwater evaluation identified those areas that have the greatest estimated

groundwater nutrient contribution in the Tahoe Basin.

The information in the groundwater evaluation was based on best engineering and geological judgment, interpretation, and modeling using existing data, reports, interviews, and scientific principles. The estimate of nutrient loading was separated into five regions based on political boundaries and major aquifer limits. The total estimate indicates that groundwater is a significant contributor of nutrients. The overall nitrogen and phosphorus loading contributed by groundwater is estimated to be 13 percent and 15 percent of the total annual budget for the lake, respectively for nitrogen and phosphorus. This estimate also indicates that the areas most deserving of additional investigation, characterization, and mitigation are the Tahoe Vista/Kings Beach and Tahoe City/West Shore regions. The key sources evaluated for nitrogen and phosphorus included fertilized areas, sewage, infiltration basins, and urban infiltration.

The groundwater evaluation concluded that since groundwater is an important contributor of nutrients to Lake Tahoe; more information on the subsurface geology and the natural levels of groundwater nitrogen and phosphorus in the Tahoe Basin is needed. The evaluation also concluded that phosphorus plumes generated from many sources in the Tahoe Basin might be a continuing problem for years to come despite immediate efforts to limit introduction of any new phosphorus.

Study Team-Developed Enhancements:

- Support strong continuing role of research and science in the EIP.
- Critical need for immediate analysis of the effects of stormwater runoff infiltration practices have on groundwater.

Sediment Loadings and Channel Erosion

The purpose of the sediment loadings and channel erosion evaluation was to combine detailed modeling of several representative watersheds with reconnaissance level evaluation of numerous sample sites to determine which basins and areas were contributing sediment to Lake Tahoe. Additionally, numerical modeling of upland and channel erosion processes for the next 50 years was conducted on three representative watersheds.

The evaluation included analysis of land use, land cover, soil erodibility, steepness, geology, and historical stream cross-sections. Historical flow and sediment-transport data from more than 30 sites were used to determine bulk suspended-sediment loads and yields for sites around the lake. Fine-grained sediment transport was determined from historical data based on relations derived from particle-size distributions across the range of measured flows.

The evaluation concluded that stream erosion contributes a significant level of fine sediment and nutrients to the lake. When comparing those watersheds with little human disturbance with those watersheds that have experienced human disturbance, a very significant increase in erosion and sediment yield is evident from the disturbed watersheds. The evaluation also concluded that the storm event of 1997 acted to flush out many streams in the Tahoe Basin resulting in lower sediment yields in successive years following the event. Several streams such as the Upper Truckee River, Blackwood Creek, and Third Creek, continue to yield significant sediment. The evaluation looked in greater detail at the Upper Truckee River and concluded that the controlling stream bank erosion in reaches adjacent to the golf course and downstream from the airport could significantly reduce sediment delivery to the lake.

Study Team-Developed Enhancements:

- Support strong continuing role of research and science in the EIP.
- Continue structured land use policy to regulate watershed disturbance.

Urban Stormwater Master Planning Evaluation

Stormwater and other surface water runoff have been shown to be a significant contributor of pollutants and to the loss of clarity in Lake Tahoe. The stormwater management evaluation assessed the current status of urban stormwater master planning in the Tahoe Basin, comparing it to state-of-the-art planning within the industry, and evaluating site-specific best management practices issues.

The evaluation concluded that while numerous activities relating to urban stormwater management are underway in Tahoe Basin, a comprehensive master planning strategy does not presently exist. Master planning might prevent redundancies in the Tahoe Basin and identify consistent strategies to implement regional best management practices.

Study Team-Developed Enhancement:

- Initiate a comprehensive urban stormwater master planning strategy.

Future Considerations

Results of the Framework Study and the parallel activity spurred by the SNPLMA Amendment represent a dynamic opportunity for Federal agencies in the Tahoe Basin to turn the corner on basin-wide, programmatic EIP implementation. With Elements I, II, and III, stakeholders have at their disposal components that will result in a comprehensive approach to basin-wide Federal EIP implementation. Congress, Federal agency management and other interested parties, however, must recognize that constraints of the Framework Study process did not provide the opportunity to fully develop all proposed concepts in the Framework Report. As such, future considerations are necessary to ensure success.



The focus of these considerations should be to identify and analyze the potential implications of implementing a comprehensive framework program and presenting the results in a programmatic or comprehensive document.

Specifically, the intended and unintended consequences of implementing Elements I and III (for example, identifying effects on existing non-Federal programs or state agencies) and environmental affects should be fully considered. Further, the manner in which implementation of Elements I and III would interrelate to and be affected by Element II should be considered carefully.

Focusing on continued development of the infrastructure and processes of a comprehensive framework will:

- Capitalize on the momentum generated during the Framework Study and the stakeholders' activities.
- Result in consistent progress toward improvement of water quality in Lake Tahoe.
- Assist in the attainment of the ETCC's used to measure environmental improvement in the Tahoe Basin.

- Allow for efficient use of Federal agency resources (including staff resources and SNPLMA funding).

Development of the infrastructure and processes needed to support a comprehensive framework is critical to the ongoing success in the Tahoe Basin. Ongoing assessment of the effects of implementing Elements I and III, as well as interrelating all elements, will likely reveal additional processes and infrastructure needed to address the complex and evolving needs of the Tahoe Basin. Some of these could include:

- Development of the agency policies and processes surrounding implementation.
- Definition of roles and responsibilities of entities involved.
- Definition of coordination and communication strategies for entities directly and indirectly involved.
- Definition of a structure to ensure accountability.
- Definition of public participation in the processes.
- Definition of staffing and funding requirements.

The success of the enhancements will require that the implementing agencies have the flexibility to respond to these evolving needs while being sensitive to other Tahoe Basin processes and programs. The existing stakeholder collaboration and congressional interest currently create an environment for implementing successful change in the Tahoe Basin.

ACRONYMS AND ABBREVIATIONS

1969 Compact	Tahoe Regional Planning Compact of 1969
CalTrans	California Department of Transportation
Coalition	Lake Tahoe Transportation and Water Quality Coalition
Corps	U.S. Army Corps of Engineers
CTC	California Tahoe Conservancy
EIP	Environmental Improvement Program
ETCC's	Environmental Threshold Carrying Capacities
FAMU	Federal Agency Management Act
FHWA	Federal Highway Administration
Framework Report	Lake Tahoe Basin Framework Implementation Report
Framework Study	Lake Tahoe Basin Framework Implementation Study
LTBEC	Lake Tahoe Basin Executives Committee
LTFAC	Lake Tahoe Federal Advisory Committee
NDEP	Nevada Division of Environmental Protection
NLTRA	North Lake Tahoe Resort Association
Reclamation	U.S. Bureau of Reclamation
RWQCB	Regional Water Quality Control Board
SNPLMA	Southern Nevada Public Land Management Act of 1998
TMPO	Tahoe Metropolitan Planning Organization
TREX	Tahoe Regional Executives Committee
TRPA	Tahoe Regional Planning Agency
UC	University of California
USDOT	U.S. Department of Transportation
USEPA	U.S. Environmental Protection Agency
USFS	U.S. Forest Service
WRDA	Water Resources Development Act