ATTACHMENT B

Local Groundwater Assistance Grant Application Cover Sheet
(Attachment A)

ATTACHMENT A
LOCAL GROUNDWATER ASSISTANCE GRANT APPLICATION COVER SHEET
LOCAL GROUNDWATER MANAGEMENT ASSISTANCE ACT OF 2000

Proposal Title: Development of Groundwater Resources in the Presence of Contaminant Plumes, South Lake Tahoe, CA

Name of Agency: South Tahoe Public Utility District

Contact person/title: Ivo Bergsohn / Hydro-Geologist

Address: 1275 Meadow Crest Drive, South Lake Tahoe, CA 96150

County: El Dorado

Telephone number: 530.544.6474 x204 Fax number: 530.541-0499

E-mail address: ibergsohn@stpud.dst.ca.us

Date Groundwater Management Plan adopted, if any: December 21, 2000

Pursuant to Water Code Section: 10750, et.seq. or other legal authority: (Please identify)

Amount of grant requested: $210,802

Duration of project: July 1, 2003 - May 1, 2005

Location and geographic boundaries of the proposed project:

Meyers/Tahoe Paradise area, El Dorado County, California to include portions of Sections 24, 25, and 36, T12N, R17E; Sections 19, 20, 29, 30, 31 and 32 T12N, R18E; and Sections 5, 6, 7 and 8, T11N, R18E

Project Coordinates: Latitude (North): 38.8606 Longitude (West): -120.0215

DWR Bulletin 118-80 Hydrologic Study Area (HAS): North Lahontan (NL)

DWR Bulletin 118-80 Basin-subbasin Number: 6-5.01

FOR PROJECT TRACKING PROPOSES, PLEASE PROVIDE THE FOLLOWING INFORMATION:

1. Name, title, address, telephone number, fax number, and e-mail address of the person of the applicant's governing body (such as mayor, supervisor, board president or chairman, etc) authorized by the Agency's resolution to file the application and enter into an Agreement with DWR:

Name: Duane Wallace Phone: 530.544.6474 Fax: 530.541.0614

Title: President e-mail:

Address: 1275 Meadow Crest Drive

City: South Lake Tahoe Zip: 96150

2. Name, title, address, telephone number, fax number, and e-mail address of the applicant's local contact person to be designated as the Agency's Project Manager:

Name: Ivo Bergsohn Phone: 530.544.6474 Fax: 530.541-0614

Title: Hydro-Geologist e-mail: ibergsohn@stpud.dst.ca.us

Address: 1275 Meadow Crest Drive

City: South Lake Tahoe Zip: 96150

3. Names of State Senate and Assembly representatives for project area:

State Senator: Rico Oller District: 1

State Senator: District:

State Assemblyperson: Tim Leslie District: 4

State Assemblyperson: District:

State Assemblyperson: District:

1. A concise description of the proposed project:

The proposed project will involve developing a numerical grounwater model to assist the South Tahoe Public Utility District (District) manage it's groundwater resources in the presence of known anthropogenic and natural contaminants. The model will be developed by extending an existing regional-scale groundwater flow model to include the Tahoe Meyers/Tahoe Paradise Study Area and constructing a highly-refined sub-regional scale groundwater flow and contaminant transport model for that area. Additional data collection in the form of thermal measurements and stable isotopes will be used to constrain uncertainty in the ground-water flow model.

The model will be used to simulate the grounwater system of the South Tahoe Groundwater Basin and the hydraulic and contaminant mass transport effects on that system from the operation of it's wells. Results from the modeling simulations will be used to assist the District in developing optimal pumping schemes to minimize the movement of known contaminants into existing drinking water well sources, assist in the placement and development of appropriate monitoring schemes for sentinel wells and assist in the identification of potential new sites for future ground-water development. The modeling simulations will also be used as a public education tool to illustrate the nature of groundwater flow and contaminant transport in the South Lake Tahoe area and to enhance awareness of the susceptibility of community drinking water wells to contamination.

ATTACHMENT C

Proposed Project Schedule and Accompanying Project Task List

STPUD - AB303 Project Schedule

Task	2003-04												2004-05									
	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A
1. Field Investigations																						
1a. Temperature Measurements and Sample Collection																						
2. Model Development																						
2a. Heat flow analysis																						
2b. Regional scale groundwater model																						
2c. Geologic characterization within Tahoe Paradise																						
2d. High-resolution flow and transport model																						
3. Management and Planning Alternatives																						
3a. Assess impacts of Tahoe Paradise aquifer development																						
3b. Test hypotheses using detailed model																						
3c. Formulate feasible planning and management alternatives																						
3d. Analyze alternatives																						
4. Develop Advanced Graphical Animations																						
	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A

Tasks

Major tasks detailed below include (1) field investigations to facilitate characterization of geologic heterogeneity and subsurface heat flow patterns (2) geologic characterization, (3) and development transport models. In addition, although the proposed work focuses on model development, we anticipate applications will arise concurrently that might be addressed with interim versions of the models.

1. Field Investigations
    a. Temperature measurements.
        i. Identify suitable well and soil sites, deploy temperature tidbits
        ii. Identify accessible wells, measure temperature profiles
    b. Stable Isotope analysis
        i. Select suitable well sites
        ii. Collect groundwater samples following appropriate protocols
        iii. Submit selected samples for laboratory analysis of stable isotopes

2. Model Development
    a. Heat-Flow Analysis
        i. Define aerial groundwater flow in Tahoe Paradise. Gather data pertaining to Tahoe Paradise geology and hydrology from STPUD and other sources
        ii. Evaluate field data on soil temperatures and well temperature profiles.
        iii. Download and process GIS layers for aerial interpolation of surface temperature
        iv. Integration and analysis of geologic, hydrologic, and thermal data, including use of SUTRA for detailed analysis of selected areas. Direct analysis toward improved definition of groundwater flow in Tahoe Paradise.
        v. Use analysis results to define recharge boundary conditions for, and to independently constrain and calibrate, regional flow model.
    b. Regional-Scale Groundwater Model
        i. Assemble and analyze data pertaining to Tahoe Paradise geology and hydrology from STPUD and other sources
        ii. Extend (Agra) regional-scale model into the Tahoe Paradise basin, relying in part on information on aerial and mountain front recharge and other boundary conditions from heat flow analysis.
        iii. Calibrate regional model to available data, e.g., hydraulic head.
    c. Geologic Characterization within the Tahoe Paradise Area
        i. Assemble and inventory available driller's logs, geophysical logs, and measurement data.
        ii. Characterize depositional environment and regional hydrostratigraphy.
        iii. Estimate key attributes of hydrofacies including volume fractions, mean lengths and tendency for juxtaposition.
        iv. Simulate hydrofacies distribution conditioned on available data.

d. High-resolution flow and transport models
    i. Define boundary conditions from regional-scale model results.
    ii. Use results from geologic characterizations to define high-resolution hydrofacies distribution (see Figure 2).
    iii. Assemble and analyze available data on conductivity, storage, heads and concentrations.
    iv. Calibrate model to observed hydraulic head and MtBE concentration.

3. Management and Planning Alternatives
    a. Use regional-scale model to assess impacts of further aquifer development in Tahoe Paradise area on greater southern Tahoe basin.
    b. Use high-resolution model to test hypotheses on effects of pumping schedules and locations on vulnerability.
    c. Formulate feasible management and planning alternatives.
        i. Locate new wells to minimize susceptibility.
        ii. Design strategies for supply well pumping in the presence of MtBE and natural contaminants.
    d. Analyze alternatives.
        i. Assess supply well vulnerability
        ii. Assess third party impacts and vulnerability.
    e. Optimize pumping schedules.
        i. Time permitting, a formal optimization scheme can be developed to determine optimal pumping schedules to minimize vulnerability while meeting demand.
4. Develop advanced graphical animations of model results as a public education tool.

ATTACHMENT D

Proposed Budget Worksheet

STPUD - AB 303 Budget

UC-Davis (UCD) Investigation Team		Monthly salary	07/01/03-06/30/04	07/01/04-05/1/05
Non-Student PGR VI	10/02-9/03	$ 3,350		
Eric Labolle	10/03-9/04	$ 3,484		
	10/04-9/05	$ 3,623	$ 20,703	$ 17,907
Benefits (25%)			$ 5,176	$ 4,477
Non-Student PGR IV	10/02-9/03	$ 3,060		
James Trask	10/03-9/04	$ 3,182		
	10/04-9/05	$ 3,309	$ 37,818	$ 32,709
Benefits (25%)			$ 9,455	$ 8,177
Undergraduate Assistant (520 hr yr 1; 400 hr yr 2)			$ 5,200	$ 4,000
Benefits (3%)			$ 156	$ 120
UCD - Salary and Benefits			**$ 78,507**	**$ 67,389**
Supplies:				
Computer storage media & office			$ 1,000	$ 300
Groundwater temperature monitoring (90 portable temperature loggers)			$ 10,000	
GIS layer data (temperature related satellite data)			$ 1,600	
Field sampling supplies			$ 500	$ 400
Isotopic analyses (O-18, H-2; $30/sample @ UC Davis)			$ 1,500	
UCD - Supplies			**$ 14,600**	**$ 700**
Travel:				
Transportation (field work) (trips to field area; 18 yr 1, 12 yr 2; $0.365/mi; 310 mi/trip)			$ 2,037	$ 1,358
Lodging (45 nights yr 1; 30 nights yr 2)			$ 3,150	$ 2,100
Food			$ 1,225	$ 1,050
Present results of research at professional meetings				$ 2,100
UCD - Travel			$ 6,412	$ 6,608
Direct Costs Total:			**$ 99,519**	**$ 74,697**
Indirect Costs (10%)			**$ 9,952**	**$ 7,470**
UCD - Total:			**$ 109,471**	**$ 82,167**

UCD - Award:	**$191,638**
STPUD Collaboration & Project Oversight (10%):	**$19,164**
Total Award:	***$210,802***