SACRAMENTO GROUNDWATER AUTHORITY

NORTH SACRAMENTO COUNTY REGIONAL GROUNDWATER MODEL ENHANCEMENTS

2005 PROJECT WORK PLAN

Purpose of Proposed Work

The purpose of this project is to develop an enhanced modeling tool with sufficient details and features to support the cost-effective analysis of multiple future alternative management scenarios consistent with the SGA GMP goal and objectives. The enhanced model will need to have sufficient details and features to support the analysis of the alternative water supply management plans and scenarios proposed either by the SGA or in the RWA's Integrated Regional Water Management Plan (IRWMP).

Goal/Objective of Proposed Work

The goal/objective of the proposed work is to create a reliable regional and local modeling tool through (1) an improved level of calibration that will be defined by SGA, the selected modeling consultant, and the Technical Team and (2) an improved baseline conditions model based on best available and most recent data.

Scope of Work

As noted earlier, RWA will be funding Phases 1 and 3 of the modeling project to support the development of the IRWMP. This scope of work presents the SGA activities associated with Phase 2 of the project, Model Calibration and Baseline Development and includes the tasks described below.

Task 1 Conduct Calibration and Sensitivity Analysis of Refined Model

The purpose of this task is to calibrate the refined model and complete a sensitivity analysis on selected calibration parameters. The model calibration will focus on the enhanced area of north Sacramento County developed for this project. The calibration will be based on the daily hydrologic data and simulation time step for the 1969 to 1995 hydrologic period. The calibration process includes the following subtasks:

Task 1.1: Incorporate Additional Calibration Wells

The purpose of this task is to obtain information and analyze the data for additional calibration wells. Subsequently, the input data for additional calibration wells with appropriate properties and characteristics, as well as groundwater level data, will be developed for the model. An initial set of additional calibration

wells will be identified from the wells included in the SGA's DMS. The potential calibration wells will be screened individually to assure they have adequate well construction data and water level measurements during the 1970 to 1995 calibration period. An estimated 15 to 20 additional calibration wells will be added to the enhanced model area.

Task 1.2: Analyze Water Balances

The purpose of this task is to analyze the water balances and water budgets of the enhanced model area due to implementation of the refined model grid, additional detailed data describing the physical system, and daily hydrologic data. Part of this task includes completing a quality assurance check of the model input data to ensure that it is correctly incorporated into the model. If the input data is correct, the water balances should not have any anomalous values or trends in the model output (water balances).

Task 1.3: Calibrate Regional and Local Groundwater Levels

The purpose of this task is to calibrate the regional and local groundwater levels by adjusting soil, stream, and aquifer parameters. Simulated water levels will be compared to available published water level maps and available water level data at individual calibration wells. This includes calibration of the water levels for the existing and new calibration wells (in the enhanced model area). The water level data for the new calibration wells will be provided by the SGA's DMS.

Task 1.4: Calibrate American River Flow Conditions

The purpose of this task is to calibrate the simulated American River flows to the observed river flows. Streambed parameters will be modified to match the simulated flow to the recorded flows.

Task 1.5: Perform Sensitivity Analysis

The purpose of this task is to perform the sensitivity analysis of the refined north Sacramento County IGSM model in the refined model area. Up to five calibration parameters will be selected for the sensitivity analysis.

Task 2 Develop Baseline Condition Planning Models

The purpose of this task is to develop the planning level models for the north Sacramento County IGSM including an existing conditions model at the 2000 level of development and a build-out conditions model at the 2030 level of development. The subtasks associated with this work are listed below.

Task 2.1: Develop Existing Conditions Baseline Model

The purpose of this task is to develop an existing conditions planning model for the enhanced north Sacramento County IGSM at the 2000 level of development. The activities associated with this task include:

a. Developing 2000 level of land and water use data where needed

b. Developing water supply data using the 1922 to 1995 hydrologic record, based on the 2000 conditions in CALSIM II

c. Developing daily rainfall for the 1922 to 1969 period (the 1969 to 1995 daily rainfall data will be available from the work completed in Phase I)

d. Developing daily streamflow data for the 1922 to 1995 period at the 2000 conditions

e. Completing QA/QC on the existing conditions planning model by comparing model input to the accepted data sets that represent the 2000 level of development

Task 2.2: Develop Build-Out Conditions Baseline Model

The purpose of this task is to develop a build-out conditions planning model for the enhanced north Sacramento County IGSM at the 2030 level of development. The activities associated with this task include:

a. Developing 2030 level of land and water use data where needed

b. Developing water supply data using the 1922 to 1995 hydrologic record, based on 2030 conditions in CALSIM II

c. Developing daily stream flow data for the 1922 to 1995 period at the 2030 conditions

d. Completing QA/QC on the build-out conditions planning model by comparing model input to the accepted data sets that represent the 2030 level of development

Task 3 Prepare Project Report

The purpose of this task is to prepare a report documenting the work performed under Tasks 1 and 2.

Task 3.1 Prepare Draft Model Calibration and Baseline Development Report

A draft report will be prepared and submitted for review to the SGA staff, Technical Team members, stakeholders and DWR.

Task 3.2 Prepare Final Model Calibration and Baseline Development Report

Upon receipt of comments, a final report will be prepared and made available to SGA, individual districts, stakeholders, and DWR.

Task 4 Project Management, Coordination, and Public

Outreach

The purpose of this task is to provide general project management and coordination with the Technical Team throughout the duration of the project. The subtasks associated with this work are listed below.

Task 4.1: Project Team Meetings

This project has an accelerated schedule. Three meetings, including a kickoff meeting, will be scheduled with the Technical Team to coordinate and communicate the overall project progress and to provide a channel for communication between the consultant and the Technical Team. This subtask includes time to prepare for and attend the meetings.

Task 4.2: Conduct Two Public Workshops and Stakeholder Outreach Meetings

In order to coordinate the calibration of the model and the development of the baseline conditions with the stakeholders, two public workshops will be conducted. The first workshop will be held at the beginning of the project to present the modeling assumptions, calibration approach, and baseline scenario approach and to receive input from the stakeholders on these approaches. The second workshop will be held after completion of the model calibration to present the results of the model calibration and to discuss the strengths and limitations of the model, as the stakeholders will be discussing and making decisions on the possible water supply scenarios.

Task 4.3: General Project Management and Coordination

This task includes general project management and coordination of the consultant with SGA and DWR staff throughout the duration of the project. As part of this task, monthly progress reports documenting the work completed will accompany the invoices submitted to SGA.

Project Deliverables

As shown in the project work items above, deliverables that will ensure progress and accomplishments include:

a. Presentations at three project Technical Team meetings

b. Presentations to two public workshop/stakeholder outreach meetings

c. Draft Project Report

d. Final Project Report

e. Quarterly Progress Reports to DWR, also posted on SGA web site

Quarterly progress reports will be submitted on a regular schedule beginning on the contract execution date. SGA funds the quarterly reports through its own staffing and does not consider it a local cost-share for grant purposes.

Environmental Compliance

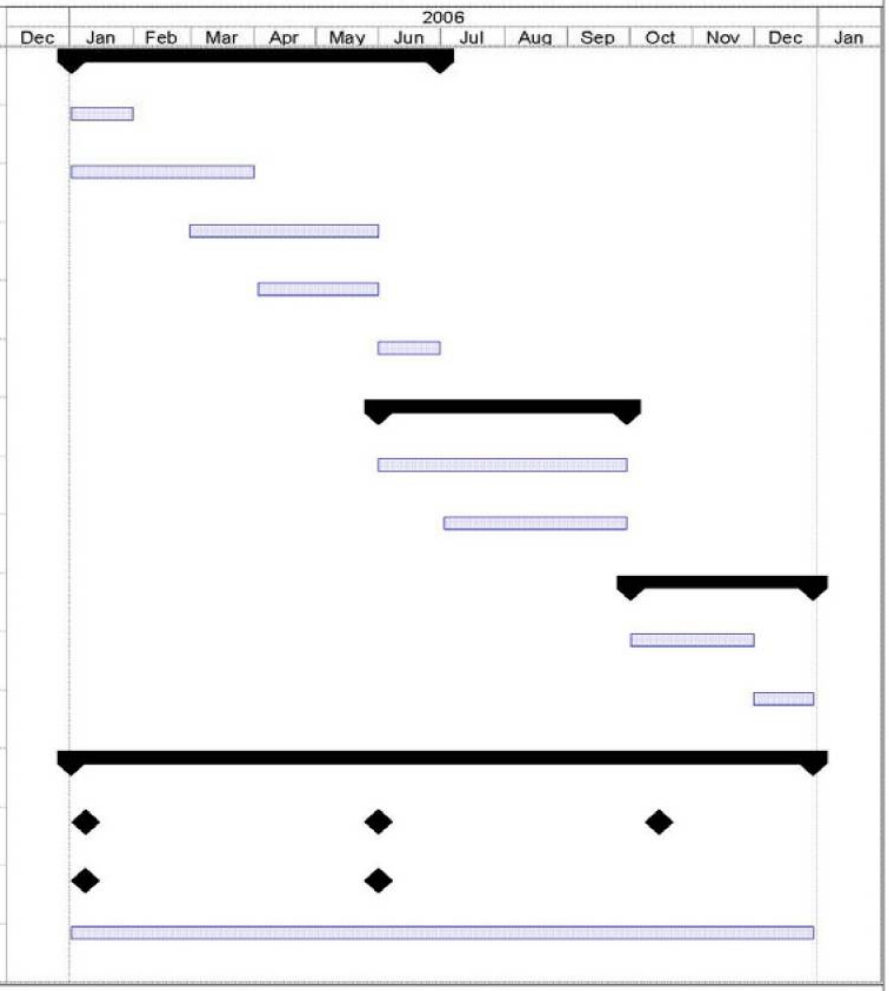
The proposed project does not include any direct or indirect changes to the existing environment, nor does it include any foreseeable changes in the future. The project includes a desktop analysis of an existing groundwater model. It does not include construction, grading activities, or improvements to the facilities.

Since the proposed project is an off-site study that does not include any physical changes to the environment, it is not subject to the California Environmental Quality Act (CEQA). The project does not qualify as a “project” under Section 15378 of the CEQA Guidelines.

2005 PROJECT SCHEDULE

SACRAMENTO GROUNDWATER AUTHORITY
Northern Sacramento County Regional Groundwater Model Enhancements
Model Calibration and Baseline Conditions Schedule

Task	Task Name
Task 1	**Conduct Calibration and Sensitivity Analysis of Refined Model**
Task 1.1	Incorporate Additional Calibration Wells
Task 1.2	Analyze Water Balances
Task 1.3	Calibrate Regional and Local Groundwater Levels
Task 1.4	Calibrate American River Flow Conditions
Task 1.5	Perform Sensitivity Analysis
Task 2	**Develop Baseline Condition Planning Models**
Task 2.1	Develop Existing Conditions Baseline Model
Task 2.2	Develop Buildout Conditions Baseline Model
Task 3	**Prepare Project Report**
Task 3.1	Prepare Draft Model Calibration and Baseline Development Report
Task 3.2	Prepare Final Model Calibration and Baseline Development Report
Task 4	**Project Management and Coordination**
Task 4.1	Project Team Meetings
Task 4.2	Conduct Two Public Workshops and Stakeholder Outreach Meetings
Task 4.3	General Project Management and Coordination



Project: Schedule_044900
Date: Thu 11/18/04

Task | Milestone | Summary

Bookman-Edmonston, A Division of GEI Consultants

2005 PROJECT BUDGET

(COSTS MAY VARY WITH YEAR AND LOCATION)

Task	Description	Principal $180/hr	Supervising $150/hr	Senior $140/hr	Associate $125/hr	Assistant $95/hr	GIS Specialist $102/hr	Graphical $65/hr	Admin Assistant $52/hr	ODCs 1.0	Total Cost
1	Conduct Calibration and Sensitivity Analysis of Refined Model										
1.1	Incorporate Additional Calibration Wells	10	4	28	36	0	0	0	0	$0	$10,820
1.2	Analyze Water Balances	32	20	68	108	0	0	0	0	$0	$31,780
1.3	Calibrate Regional and Local Groundwater Levels	24	6	136	44	0	0	0	0	$0	$29,760
1.4	Calibrate American River Flow Conditions	12	2	32	16	0	0	0	0	$0	$8,940
1.5	Perform Sensitivity Analysis	24	8	24	104	0	0	0	12	$0	$22,504
	Task 1 Total	102	40	288	308	0	0	0	12	$0	$103,804
2	Develop Baseline Condition Planning Models										
2.1	Develop Existing Conditions Baseline Model	20	8	72	162	0	56	0	32	$0	$42,506
2.2	Develop Buildout Conditions Baseline Model	12	12	48	120	0	48	0	16	$0	$31,408
	Task 2 Total	32	20	120	282	0	104	0	48	$0	$73,914
3	Prepare Project Report										
3.1	Prepare Draft Model Calibration and Baseline Development Report	20	16	60	80	0	16	0	24	$250	$27,530
3.2	Prepare Final Model Calibration and Baseline Development Report	12	8	32	16	0	4	0	16	$1,000	$12,080
	Task 3 Total	32	24	92	96	0	20	0	40	$1,250	$39,610
4	Project Management, Coordination, and Public Outreach										
4.1	Project Team Meetings (prepare for and attend three meetings)	24	24	32	0	0	0	0	8	$0	$12,816
4.2	Conduct Two Public Workshops and Stakeholder Outreach Meetings	16	0	24	0	0	0	0	0	$0	$6,240
4.3	General Project Management and Coordination	36	0	32	0	0	0	0	48	$0	$13,456
	Task 4 Total	76	24	88	0	0	0	0	56	$0	$32,512
TOTAL PHASE 2 PROJECT COST		242	108	588	686	0	124	0	156	$1,250	$249,840