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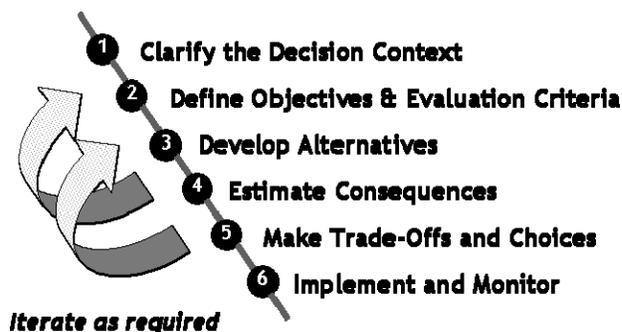
**Re: Preliminary Proposal for Decision Support Services for the Edwards
Aquifer Recovery Implementation Program**

Dear Mr. Gulley,

In follow-up to our conversation two weeks ago, I am writing to provide you with an estimate of what would be involved should you wish to have Compass and Value Scope support you in a structured decision making process for the Edwards Aquifer Recovery Implementation Program (EARIP).

Structured Decision Making (SDM) is a systematic way to approach complex decision problems, with emphasis on identifying and evaluating management or policy options (see www.StructuredDecisionMaking.org). It involves six steps (Figure 1). Tools from the decision sciences (e.g., objectives hierarchies, influence diagrams, strategy tables, impact analysis/gaming tools, multi-attribute trade-off analysis, etc.) can be applied at each step to help decision makers deal with the complexity inherent in resource management decisions. What exactly is done at each step (e.g., the degree of quantification, the types of analytical tools used, etc.) depends on the nature of the decision, the availability of data and modeling capability, as well as practical realities such as timelines and budgets. However, the steps themselves are generic and should each be addressed in any decision process.

Figure 1 The Structured Decision Making Process



SDM is particularly relevant for decisions that need to:

- Address multiple objectives
- Deal with high and persistent uncertainties
- Communicate complex technical information to decision makers of varying technical literacy
- Organize multiple and/or complex alternatives
- Facilitate collaborate decision making among multiple participants
- Build trust among and support from stakeholders
- Provide transparency and accountability

You requested a proposal from us for assistance in the “Trade-off Analysis” stage, beginning at or around mid-2009. As I mentioned at the presentation to the Steering Committee on May 8, completing the first four steps of the SDM process is an important prerequisite to holding productive deliberations about trade-offs. In particular, several things must happen: a) the Steering Committee needs to develop the capacity and the discipline to focus on the objectives and evaluation criteria in its deliberations; b) the alternatives need to be carefully developed and grouped into strategies or portfolios; c) the technical analysis must be designed to deliver information about the evaluation of alternatives in a manner consistent with the objectives and criteria; and d) the implications of uncertainty with respect to biological objectives (and possibly others) will need to be carefully assessed. Further, the Steering Committee will need to have an appropriate level of participation in every task so that they have confidence in the material presented to them when they are asked to make trade-offs.

Exactly what will make sense for you for decision support will be best defined following the Decision Sketching Workshop, proposed under separate cover for September or October, 2008. However, to assist you in planning, I offer the following tasks and budget as a rough guide to what you might anticipate in terms our involvement should you decide to engage us.

I anticipate that the work will be completed by myself and Dr. Robin Gregory, of Value Scope Research. Depending on the tasks, we may also involve our colleagues Michael Harstone or Graham Long, both of Compass. Both Compass and Value Scope have extensive experience with decision analysis and facilitation for multi-objective, multi-stakeholder planning processes for water resources management (see attached corporate profiles and CVs).

We propose the following six tasks.

1. **Process Design.** Based on the outcome of the Decision Sketching Workshop, prepare a decision charter, including principles/guidelines to guide the deliberative process, and an overall schedule for the integration of technical and deliberative tasks, including high level task descriptions for technical modeling. This will involve working with your technical specialists and working groups to carefully scope the terms of reference for technical analysis, and ensure it is focused, timely, and structured to serve the deliberative process.
2. **Objectives and Alternatives – One SC Meeting.** We suggest that there will be a need for at least one meeting of the Steering Committee (SC) to review and refine objectives, evaluation criteria and alternatives. At this meeting, a preliminary set of potential actions will be presented. The workshop will focus

on a) screening individual actions, b) grouping actions into packages or portfolios using a Portfolio Builder and c) refining the objectives and evaluation criteria that will be used to evaluate and select.

3. **Consequences – One SC Meeting.** At this stage it will be useful to develop and test a Portfolio Evaluator. This is a high level impact model that will allow the impacts of the proposed portfolios to be estimated. Relying on the technical analysis done by your biological modeling group and other technical work groups, we would develop an interactive gaming tool that can be used in a workshop format to allow the Steering Committee and stakeholders (or a subgroup) to explore the impacts of different combinations of actions. The purpose of this stage is to iteratively improve the alternatives under consideration, eliminate “dominated” alternatives, find win-wins, and identify the key trade-offs or choices that need to be made.
4. **Uncertainties – One SC Meeting.** Coming out of the Decision Sketching workshop, we anticipate that we will identify critical uncertainties that must be effectively addressed in order to constructively and collaboratively move forward with the trade-off analysis and decision making for the EARIP. We propose to work with appropriate technical experts to determine how they may affect the decision process and how uncertainty can be reduced or better characterized. This is likely to involve a structured process for eliciting expert judgment in ways to promote insight and transparency. We will also explore methods for informing and facilitating productive discussions about participants’ risk tolerances. This will facilitate the identification of creative solutions to dealing with uncertainty (e.g., search for alternatives that are robust to uncertainty, building-in flexibility or safeguards, adaptive management, etc.).
5. **Trade-offs Analysis – Two SC Meetings.** The portfolio testing stage will produce a short list of alternatives that represent true value-based choices. Multi-attribute evaluation tools are useful at this stage to facilitate constructive deliberations. We use a combination of “top-down” (or holistic) and “bottom-up” (or decompositional) approaches designed to facilitate performance-based (rather than positional) discussion, avoid errors and biases, put all participants’ values on equal footing, and quickly pinpoint areas of agreement and disagreement to focus discussions where they are most needed. It is our experience that it normally takes at least two meetings to reach closure.
6. **Monitoring and Adaptive Management – One SC Meeting.** In a planning process such as the EARIP, there are sure to be a number of important uncertainties that remain unresolved at the time when the program will be put in place. Reaching agreement in such cases usually relies on a having a sound approach to monitoring and adaptive management in place. Resources are always limited and it will be essential to have a defensible process for prioritizing monitoring and research needs. We can work with a subgroup of the Steering Committee to develop a system for prioritizing monitoring and research needs, but anticipate the need for one full SC meeting for this and final closure on the process.

A rough timeline and estimate of fees is summarized in Table 1. The budget is based on an hourly rate of \$150, and 8 hours per day. In terms of timeline, we assume that the work would begin immediately after the Decision Sketching Workshop and continue through to December 2009.

Table 1 Rough Timeline and Estimate of Fees

| Task | Description | Timeline | Fees (1) |
|-----------------------------|---|-----------------|------------------|
| Process Design | Develop decision charter Coordinate technical modeling | Nov-Dec-08 | \$15,000 |
| Objectives and Alternatives | Develop Portfolios One SC Meeting | Jan-Mar-09 | \$20,000 |
| Consequences | Develop Portfolio Evaluator One SC Meeting | April-June-09 | \$20,000 |
| Uncertainties | Expert Elicitations Risk Tolerance | Jan-June-09 | \$15,000* |
| Trade-off Analysis | MATA application using VISTA One SC Meeting | Sep-Dec-09 | \$30,000 |
| Adaptive Management | Develop Prioritization criteria and tool | June-Dec-09 | \$20,000 |
| Total | | | \$120,000 |

- (1) Each SC meeting is estimated at \$12,000. It assumes a two-day meeting for two facilitators, with associated preparation, documentation and travel time (travel time billed at one-half).
(2) Our NSF Grant to provide matching funding in support of this task.

Our proposal assumes that the client will provide: a) all logistics for the meetings (e.g., invitations, venue, food, audio-visual equipment, etc.); b) a note-taker for the meetings; c) access to key resources (e.g., documentation, people, etc.); and d) coordination of all technical resources and SC members. While we would write up some guidance in terms of task descriptions for the technical modeling work, and be available to participate in conference calls for coordination purposes, we would not be acting as overall project managers, so this is a task that the EARIP program manger or other technical lead would need to do. It is important to note that between meetings, there will be follow-up work to be done to incorporate the input from the SC (e.g., refining and re-evaluating alternatives, etc.). It will be important to have a project or technical team available to do this work. The proposal also assumes that our grant from the National Sciences Foundation can provide support for some of the tasks (e.g., methodology development, documentation) related to the exploration of uncertainty and risk tolerance. The above budget does not include expenses.

This schedule of tasks outlines the scope of work that we feel must be done if you hope to hold productive discussions about trade-offs. It may be possible for you to accomplish some of the tasks on your own, with more limited involvement from us. However, our involvement in later stages of the process (e.g., trade-off analysis) would be contingent on these tasks having been accomplished in a manner consistent with structured decision making principles. We can discuss whether and how to share these tasks after the Decision Sketching Workshop in the fall, should you decide to go ahead with that.

If you have any questions, please feel free to contact me (604-641-2875), or Dr. Robin Gregory (250-539-5701), at any time.

Yours Truly,



Lee Failing
Partner, Compass Resource Management

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