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**Request For Quotation**

**And**

**Call For Participation**

**In the**

**OGC<sup>®</sup> Kentucky Watershed Modeling Information Portal**

**Annex C—KWMIP Concept of Operations**

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# Annex C: KWMIP Concept of Operations

## 1 Introduction

This Annex describes the Concept of Operations for the OGC Web Services Initiative (OWS). This document is organized around eight particular time frames or phases. The phases are:

- Proposal Development (Completed)—the time during which RFQ respondent proposals will be developed. This time will also be used by the OGC to develop draft management and communication plans for the initiative operational phases.
- Initiative Design Analysis (Completed)—the time that responses will be analysed, the initiative design will be solidified, the initiative architecture<sup>1</sup> will be refined, the initial System Architecture will be revised and a demonstration concept will be determined.
- Participant Negotiations (3/1/06 – 3/5/06):—the time will also be used to communicate with RFQ respondents concerning their proposals, to negotiate with them on their initiative participation, and to communicate the status of the OWS to the OGC Technical and Planning Committees. During this time, purchase orders for targeted participants and Memoranda of Understanding will be signed.
- Initiative Kick-off (To Be Scheduled):— the time that starts the initiative operation. This meeting will be held in Kentucky area and will last approximately three days. During the Kick-off, the participants will 1) develop generic interfaces and protocols to be used as the starting place for software components, 2) finalize the initial System Architecture, and 3) refine the Demonstration Concept. This phase is covered specifically during the period of performance of this RFQ.
- Implementation (3/15/06 – 9/30/06):—the time of designing and creating GUI pages, installing software, testing and verifying system functionality. This phase is covered specifically during the period of performance of this RFQ.
- KWMIP Network Integration/Solution Transfer (3/15/06 – 7/25/06: —The KWMIP Network Integration occurs when the interfaces and demonstrations developed during the Interface Development and Demonstration Development are transferred to Sponsor environments.
- KWMIP Acceptance Demonstration – Finished system is demonstrated (7/26/06 – 7/28/06) – 3 days – on site in Kentucky.

## 2 KWMIP Lifecycle Phases

### 2.1 Proposal Development

*The RFQ and Responses*—The primary activity during this period is the development of proposals. Proposals should reflect an understanding of the following:

- Proposing organizations must be members of OGC, or must submit an application for membership if their proposals are accepted.
- The OpenGIS® Abstract Specification, as well as OpenGIS Interface Specifications, may cover some of the technology areas under consideration in the RFQ. The relationship between the

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<sup>1</sup> The testbed architecture consists of the operational, technical, and system architectures as described in Annex B.

content of the proposal and the relevant OpenGIS specifications should be noted by the Proposing organizations.

- Proposing organizations should plan on performing all development work at their own facilities. These facilities should include a server (where applicable) that is accessible to other participants via the Internet. TIEs will be carried out among the participants based on these Internet-accessible servers.
- Proposing organizations shall plan to install their components on a Sponsor-provided facility.
- The desired outcome of the KWMIP Initiative includes an implementation that becomes part of the Commonwealth of Kentucky infrastructure. Proposals covering technologies requiring specific hardware or software environments should indicate what these are.
- Proposals need not address the full spectrum of the KWMIP architecture as outlined in Annex B. Proposals can focus on specific portions of that architecture.
- Proposing organizations should be prepared to build interoperable components and thus should be prepared to cooperate with all selected development teams, regardless of whether individual proposals covered the full KWMIP architecture or portions of it.
- Software components developed in the KWMIP initiative should either be based upon currently shipping products, or should be prototypes or pre-release versions of products that the responding organization intends to sell or otherwise distribute for ultimate deployment.
- Responding organizations must participate in the full course of interface and component development, test and integration experiments, and other essential activities throughout the initiative.
- Proposal selection and funding may be on the basis of portions of the proposal deemed most likely to lead to a successful KWMIP implementation.
- Proposing organizations should feel free to provide alternatives to the KWMIP architecture. However, it should be noted that proposals will be selected on the basis of how successfully the various components of all the selected responses interoperate. Radically different architectures that would require intensive rework on the part of a majority of the participants would have to be supported by very persuasive arguments!
- Proposing organizations should be familiar with the existing OGC Network infrastructure. OGC Network provides a set of services, datasets, components, toolkits, and reference materials that can and should be used to leverage KWMIP.
- Proposing organizations shall use the supplied template and forms to complete to their proposals.

The primary activity during this period is the development of proposals by potential participants.

During this period, there will be a bidder's teleconference, so that respondents can ask questions, request clarifications, and advise the IP Team of issues.

Those organizations or companies choosing to respond are expected to have representatives available to attend this teleconference on February 23, 2006.

Please note that this teleconference will be used to clarify questions about submitted proposals.

Furthermore, respondents should plan to send at least one engineer to the Kickoff meeting the week to be scheduled in early March.

### 2.1.1 Management Approach and Communications Plan

The OGC IP Team will apply its standard management approach, and initiate its communication plan during the period between the release of the RFQ and the submission of the responses. These activities will provide guidance to the OGC IP Team and participants for the conduct of KWMIP.

The management approach for KWMIP, as for other OGC IP initiatives, is outlined in the Interoperability Program Standards Operating Policy, Processes and Procedures (IPSOP<sup>3</sup>). This document details the following roles and responsibilities of individuals providing management support to OGC initiatives a<sup>3</sup>:

1. Sponsor Team—representatives from the organizations that have provided sponsorship for the OWS initiative.
2. OGC Initiative Manager—the OGC staff person responsible for the overall management of the OWS initiative.
3. Operations—the individual responsible for the day-to-day operation of the OWS initiative.
4. Architecture—the individuals responsible for the overall initiative architecture during the course of the OWS initiative.
5. Marketing—the individual responsible for the marketing aspects of the OWS initiative.
6. Interface Team—a team of individuals representing all of the participants that are engaged in component development and representing sponsor organizations. The primary task of this team is to develop component interface and protocol definitions, implement components, revise interface and protocol definitions, and evolve the Initiative Architecture.
7. Operation Team—a team of individuals representing all of the participant and sponsoring organizations that are engaged in demonstration, testing, or data provision. The primary task of this team is to prepare scenarios for demonstrations, design tests that exercise the components, perform data development in support of these scenarios, build demonstrations and tests, and evolve the Demonstration Concept.
8. OGC IP Team—a group composed of the OGC Initiative Manager, Architecture, Operations, and Marketing.

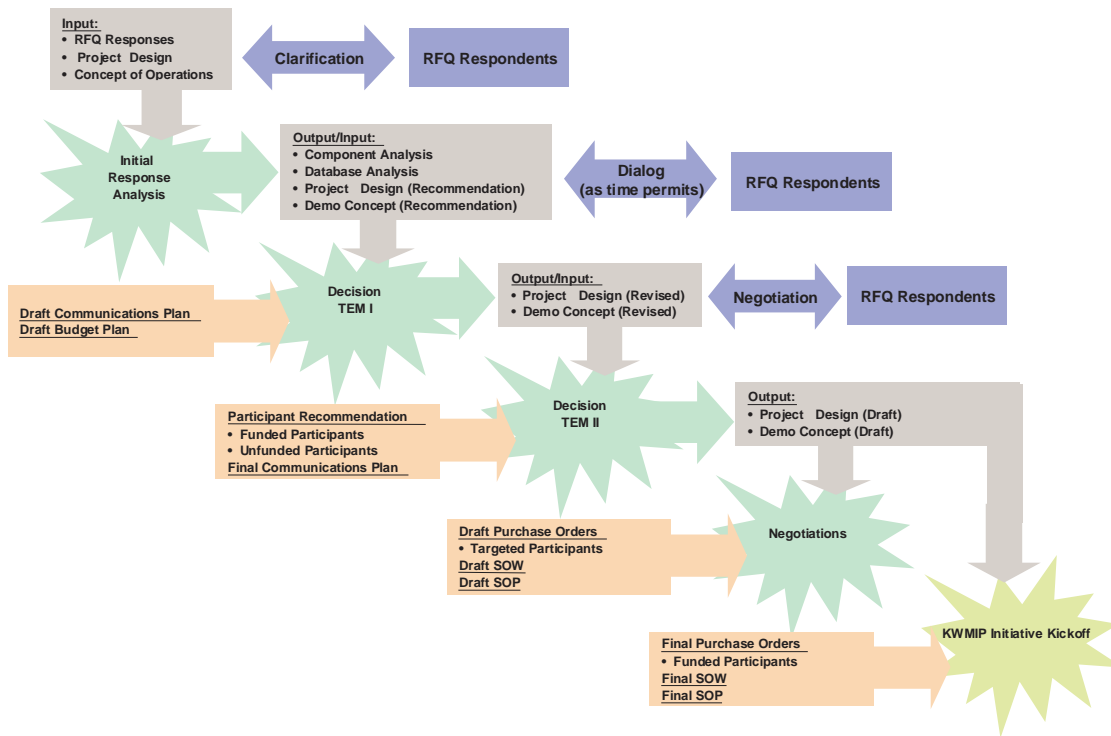
The Communications Plan, included in this RFQ as Annex D, details resources and procedures for reporting and exchanging information with participants, relevant WGs, TC, PC, and sponsors. This plan includes the development of a Web page with appropriate documents and regular updates to KWMIP information. The OGC IP Team will provide a list server for participants to exchange project-relevant e-mail. A teleconferencing plan will be developed to further support communications among participants.

### 2.1.2 Letter of Intent and Contract Execution

Respondents to this RFQ must include a signed letter of intent (LOI) with their submittal. The LOI must state that if they are selected for inclusion in the KWMIP Initiative, and they elect to participate, then they will sign a Statement of Work (SOW) or a Statement of Participation (SOP) by the end of the Negotiation Period. These contracts, also to be signed by OGC, will contain common vision and goal statements, will be an agreement to work toward these goals, and will define the roles and responsibilities of the participants. Respondents who do not submit a signed SOW or SOP by the end of the Negotiation Period will not have access to the project.

## 2.2 Initiative Design, Response Analysis, Selection and Negotiations

Figure 2 depicts the processes involved in the Initiative Design phase. Each of these processes, their inputs and outputs, and other aspects are detailed in this section.



**Figure 2: Processes Leading up to the KWMIP Initiative Kickoff Meeting**

The OGC IP Team and Sponsors will review the RFQ responses beginning immediately after the deadline for submission on March 7, 2006. During the analysis process the OGC IP Team may need to contact respondents for clarification; thus respondents should prepare for this eventuality. Time permitting, OGC may also dialog with RFQ respondents about details of the recommended Initiative Design and Demonstration Concept.

### 2.2.1 Component and Requirement Analysis

The review team will accomplish three tasks:

1. Analyze the components proposed in the RFQ responses in the context of the OWS WBS found in Annex A.
2. Compare the proposed efforts with the requirements of the initiative and determine viability.
3. Assess the feasibility of the RFQ responses against the use cases.
4. Analyze proposed specification development
5. Analyze proposed testing methodologies, including but not limited to performance testing methodologies.

### 2.2.2 Initiative (System) Architecture Recommendation

The proposal review team will then draft a straw system architecture, which will include the set of proposed components for development within the initiative, and relate them to the hardware and software

available. Any candidate interface and protocol specifications received during the RFQ process will be included with the draft initiative architecture as annexes.

### **2.2.3 Demonstration Concept Recommendation**

The team will incorporate the preliminary analysis of responses into a demonstration concept recommendation. This document will discuss the ability of proposed software components to work together in a demonstration context, and will identify gaps.

In the case of proposals for demonstration and database development tasks, proposed databases that are applicable to the project, and the details of their contents, will be listed. The review team will evaluate the ability of the proposed databases to support anticipated scenarios, and will develop an estimate of the effort required to develop metadata for the proposed data sets. Respondents are encouraged to provide as much information in this regard as they have available.

The team will also construct a listing of database compatibility and related issues (accuracy, scale, coordinate system, data type), to inform the scenario development process, and will develop early recommendations regarding the applicability of the databases with respect to demonstration scenario support.

The demonstration concept document will include references to existing and emerging resources on OGC Network, including the resources under development in this project.

### **2.2.4 Decision TEM I**

At Decision Technical Evaluation Meeting I, OGC IP Team will present to the sponsor (with the Component and Database Analyses as background):

- The Initiative (System) Architecture Recommendation, and
- The Demonstration Concept Recommendation.

This presentation will be made in the context of first drafts of the plans described above:

- Communications Plan

The primary decisions to be made by the sponsors at this TEM are:

- Is the recommended Initiative Architecture workable? If not, how to make it workable.
- Which RFQ responses, or subset thereof, should be provided cost-sharing funds and at what level given all inputs?
- Is the Demonstration Concept workable? If not, how to make it workable.
- Are the management approach and the Communications Plan reasonable and complete?

Immediately following Decision TEM I, OWS Initiative staff will begin to evaluate sponsor recommendations to the various plans and will revise the plans and concepts accordingly. It will also make budgetary adjustments based on sponsor inputs.

### **2.2.5 Decision TEM II**

At Decision Technical Evaluation Meeting II, the OGC IP Team will present to the sponsor:

- The Initiative (System) Architecture Revision, and
- The Demonstration Concept Revision.
- The Participant Recommendation



The primary decisions to be made by the sponsors at this TEM are:

- Is the revised Initiative Architecture workable? If not, how to make it workable.
- Is the Participant Recommendation correct and affordable?
- Is the Demonstration Concept workable? If not, how to make it workable.
- Are the management approach and Communications Plans reasonable and complete?

Immediately following Decision TEM II, the OGC IP Team will 1) finalize the Initiative Architecture and Concept of Operation (now including the Demonstration Concept), 2) begin to insert specific information into the existing purchase order template for each targeted participant organization, and 3) make the insertions of specifics for all participants into a contract template. Each targeted respondent POC should be available or make arrangements for alternates during this period. The output of Decision TEM II will be a final Initiative Architecture and Demonstration Concept. Proposing organizations that have been selected for funding will be notified after the completion of Decision TEM II.

### **2.3 Initiative Kickoff**

The KWMIP project will be launched officially with a Kickoff meeting in Kentucky (exact location to be announced). Prior to the Kickoff meeting all the participants will sign a Contract, as indicated above, that includes a description of the aspect of KWMIP in which they will participate.

The Kickoff meeting will address two development activities in the KWMIP process: 1) component interface and protocol definitions and 2) demonstration scenario development. The demonstration scenarios used in KWMIP will be derived from those presented in the RFQ.

### **2.4 KWMIP Interface and Demonstration Development**

This section defines an initial concept for the conduct of development activities in KWMIP. The actual schedule and further information will be provided at the Initiative Kickoff.

#### **2.4.1 Interface Selection and Project Testing**

This section defines the phase called Interface Selection (IS) and Project Testing Phase. The schedule and further information will be developed and provided at the Testbed Kickoff. This phase corresponds with **WBS Tasks 6, 7, and 8** and their related sub-tasks.

During the ID phase, the Technical Architecture (System Architecture) will be refined while groups of participants work on development of specific components. This work will be shaped by the Scenario and Data Development tasks as guided by Annex B. This mutual interaction will allow problems and successes to surface early, and will guide early TIEs, without waiting until Demonstration Integration and Testing time (See WBS task item 8.3 and related sub-tasks). Demonstration Integration and Testing will then become a matter of integrating already tested interfaces into a larger, cohesive unit capable of supporting the end-to-end nature of the scenarios.

Technology Integration Experiments (TIEs) will be conducted on a regular basis, in an iterative manner, as outlined by the initiative architects in the development schedule. During identified TIE phases of the initiative, participants developing components within the Architecture shall test interfaces for component accessibility, behavior, and most important, interoperability. The IP Team will develop a TIE matrix defining the nature of TIEs that shall be conducted and their scheduled occurrence within the initiative. Participants will report the outcome of each TIE following the TIE reporting template provided by IP Team.

TIEs will be conducted within the development cycle of the Initiative. TIEs will follow initial interface design, interface construction, component creation, and integration of the interface with application logic. During each TIE iteration, server components under test shall have data loaded to allow client software to

exercise the current functionality. Participants working behind firewalls shall take any necessary steps to allow the test to be conducted through the firewall or outside of the firewall. All participants are expected to provide appropriate documentation to allow the successful conduct of these experiments. All participants are expected to upload a reference to their components to the Initiative web site, for each TIE iteration. Participants shall report the outcome of TIEs to the OWS list and the Initiative Architecture Team.

To the extent possible in an initiative of this duration, interface definition, software development, and test will follow the spiral development paradigm. In particular, issues exposed in each round of TIEs will drive requirements for the following round of specification (interface definition) refinement, coding, and test. The development cycle may also proceed incrementally, with primary attention on a limited set of operations at each turn of the cycle. This approach may require more closely coordinated interactions among participants than in previous OGC initiatives.

Annex B, the Technical Architecture, describes an initial set of services and interface mechanisms. It also contains a notional System Architecture. Individual items in that notional System Architecture are to be refined during the Kickoff meeting and will be further refined during the ID phase. Consistent with the spiral development paradigm, it is intended that there be periods of development followed by periods of synchronization between the various component developers. This will allow for issues to be resolved and documented before divergence begins to occur between individual component developers (i.e., two server developers) and between dependent component developers (i.e., server and client developers).

## 2.4.2 Demonstrations

This section builds upon the initiative characteristics developed during the Kickoff demonstration scenario design and creation discussions. To be successful, participants must execute four activities—designing a demonstration, building a demonstration, testing the demonstration, and packaging the demonstration on portable media.

Capitalizing on the Use Case work performed at the Kickoff, participants need to expand these initiatives in four design areas—completing demonstration storyboards, finalizing specification considerations, identifying data providers, and incorporating support databases.

- Review and Finalize Storyboards—participants identify the relationships between the data, the sponsor scenarios, and the components.
- Finalize Interface Selection Considerations—given the nature of work during a pilot, some inconsistencies may remain between specifications and interfaces, and between different implementations. Participants must expose these conflicts and develop appropriate solutions.
- Survey Supporting Database Providers—access to the appropriate data is essential to exercising the initiative architecture and capturing a representative demonstration. Participants clearly must assure that the appropriate data exist and are available.
  - Determine Nature and Extent of Holdings—As mentioned previously, OGC Implementation Specification conformant data sources are preferred. However, the most important issues are the quality, availability, and interoperability of the datasets.
  - Manage Supporting Data—On-line supporting data require that the participants identify the data stores, availability, throughput limitations, and ingestion process.
- Incorporate Supporting Databases—Based on the data plan, participants must identify how data will migrate into initiative database components to be exercised for the demonstration.

The design activities will be used by the participants to build and implement prototypes that clearly demonstrate the capabilities of the components by exercising the sponsors' scenarios. The component elements of the demonstrations include but are not limited to the following:

1. All Executables
2. All Necessary Links and Datasets

3. Supporting Documentation, Installation Instructions, Scripts, etc.

Participation in demonstration exercises is predicated upon full engagement with development, testing, and planning activities throughout the KWMIP initiative.

## **2.5 KWMIP Network Integration and Solution Transfer**

The KWMIP Network Integration will be complete when the interfaces and demonstrations developed during the Interface Development and Demonstration Development have been integrated into the Kentucky infrastructure. This activity will result in configuration-controlled components that are considered stable enough to use.

Solution Transfer entails the installation of software components developed during the pilot at a Sponsor facility. This task will be complete when sufficient documentation or instruction has been provided, and adequate licensing procedures completed, to allow the Sponsor organizations to exercise and evaluate and deploy these products or product prototypes.

## **3 Progress Reporting**

The OGC IP Team will provide regular (monthly) progress reports pertaining to progress of the OWS to the sponsors (See WBS task item 1.3.1). The OGC IP Team and the sponsors intend to provide regular status reports about the program to the OGC Technical Committee, and the OGC Management committee. Currently the KWMIP lead up activities and development phase will coincide with three OGC Technical Committee and Planning Committee meetings. At that time the participants will present interface designs to the TC and MC. Demonstration scenarios and the architecture to support those demonstrations will be included in the presentation.

## **4 Integrated Initiatives**

Other ongoing IP activities may present opportunities to support KWMIP and be coordinated with the activities within KWMIP. Any such resources and related activities may be integrated with those of KWMIP in order to take advantage of economies of scale, and possibly to explore the deployment of innovations coming from KWMIP.

## **5 KWMIP RFQ Scope**

The purpose of this Request For Quotation is to solicit your proposal in response to a refined set of requirements for the Open Geospatial Consortium (OGC) KWMIP project. Using the attached template and forms, please submit your technical proposal, your cost sharing request, and your in-kind contribution declaration. Please limit your response to only those elements defined as and associated with KWMIP.