



KING COUNTY

1200 King County Courthouse
516 Third Avenue
Seattle, WA 98104

Signature Report

September 12, 2005

Ordinance 15278

Proposed No. 2005-0317.1

Sponsors Edmonds

1 AN ORDINANCE authorizing interlocal agreements
2 between King County and King County cities and utilities
3 in two King County groundwater management areas for the
4 purpose of cooperatively funding and implementing
5 groundwater science, policy, plan implementation and
6 outreach activities in the Issaquah Creek Valley and
7 Redmond Bear Creek groundwater management areas.

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9

10 BE IT ORDAINED BY THE COUNCIL OF KING COUNTY:

11 **SECTION 1. Findings:**

12 A. The Washington state Department of Ecology has identified and designated 5
13 groundwater management areas ("management areas") within King County.

14 B. With King County acting as lead agency, groundwater management plans
15 ("management plans") for four of the management areas were completed and were
16 certified by the state Department of Ecology in 2000.

17 C. Under the provisions of RCW 90.44.420 affected local governments are
18 charged with adopting regulations, ordinances and/or programs for implementing those
19 provisions of the management plan which are within their respective jurisdictional
20 authorities.

21 D. In Ordinance 14214, codified as K.C.C. 9.14, the King County council
22 formally authorized the county's groundwater protection program and provided for the
23 creation of four groundwater protection committees ("committees").

24 E. These committees have identified their top priorities for implementation of
25 their respective management plans and for groundwater protection generally within the
26 management areas.

27 F. King County and a number of cities and utilities within the management areas
28 have recognized that they have roles and responsibilities in addressing ground water
29 issues and concerns and wish to work together to address and implement the committee's
30 priorities and to protect groundwater in general (collectively, "the parties"). The parties
31 are in agreement that King County's services will be utilized to conduct specific
32 groundwater protection activities, including increased monitoring, enhanced coordination
33 among the parties and improved policies and regulations.

34 G. The parties intend that by working cooperatively to conduct the activities
35 provided for in this agreement they will be taking important steps on behalf of the public
36 to protect the quantity and quality of groundwater in their respective management areas,
37 which may be threatened by contaminant sources and increasing water supply demand.

38 H. The county, cities, and public utilities are authorized to enter into an
39 interlocal agreement pursuant to chapter 39.34 RCW, the Interlocal Cooperation
40 Act.

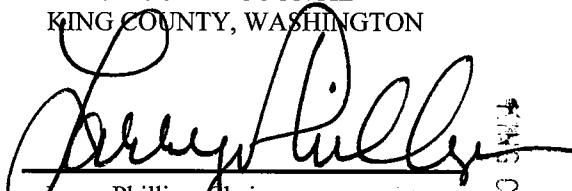
41 SECTION 2. The King County executive is hereby authorized to negotiate final
42 versions of, and to enter into, interlocal agreements with the participating cities and
43 utilities in the Issaquah Creek Valley and Redmond Bear Creek groundwater
44 management areas, in substantially the same form as attached to this ordinance, for the
45 purposes of cooperatively implementing and funding groundwater management area-
46 specific services including scientific research, monitoring and mapping, groundwater

47 protection policy development, continued operation of the groundwater protection
48 committees and groundwater-related education and outreach.
49

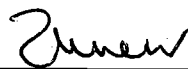
Ordinance 15278 was introduced on 7/25/2005 and passed by the Metropolitan King County Council on 9/12/2005, by the following vote:

Yes: 13 - Mr. Phillips, Ms. Edmonds, Mr. von Reichbauer, Ms. Lambert, Mr. Pelz, Mr. Dunn, Mr. Ferguson, Mr. Hammond, Mr. Gossett, Ms. Hague, Mr. Irons, Ms. Patterson and Mr. Constantine
No: 0
Excused: 0

KING COUNTY COUNCIL
KING COUNTY, WASHINGTON

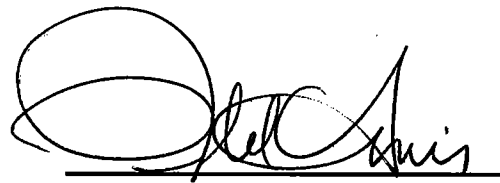

Larry Phillips, Chair

ATTEST:


Anne Noris, Clerk of the Council

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CLERK
KING COUNTY COUNCIL

APPROVED this 14 day of September, 2005.


Ron Sims, County Executive

Attachments A. Interlocal Agreement for Groundwater Protection and Management Activities in the Issaquah Creek Valley Groundwater Management Area, B. Interlocal Agreement for Groundwater Protection and Management Activities in the Redmond Bear Creek Groundwater Management Area

15278

2005-317

Attachment A

**INTERLOCAL AGREEMENT
FOR GROUNDWATER PROTECTION AND MANAGEMENT ACTIVITIES IN
THE ISSAQUAH CREEK VALLEY GROUNDWATER MANAGEMENT AREA**

This Agreement is entered into by King County, Washington, hereinafter referred to as "King County" or the "County," the City of Issaquah, hereinafter referred to as "Issaquah," and the Sammamish Plateau Water and Sewer District, hereinafter referred to as the "District," collectively referred to as the "Parties," for the purpose of cooperatively conducting activities related to groundwater protection and management in the Issaquah Creek Valley Groundwater Management area.

WHEREAS, the Washington State Department of Ecology (DOE) has been authorized by RCW 90.44.400 and its implementing regulations, WAC 173-100, to identify and designate groundwater management areas for the purposes of protection of water quality, assurance of quantity, and efficient management of water resources to meet future needs, and;

WHEREAS, in 1986 DOE designated the Issaquah Creek Valley Groundwater Management Area (hereinafter "Management Area"), which includes the Issaquah Valley Aquifer, and established the Issaquah Creek Groundwater Advisory Committee to oversee development of a groundwater management plan, and;

WHEREAS, DOE designated the Seattle/King County Department of Public Health as the lead agency to work with stakeholders and potential implementing agencies to develop the Issaquah Creek Valley Groundwater Management Plan (hereinafter "Management Plan"), and;

WHEREAS, in 1996 the King County Department of Natural Resources replaced the Seattle/King County Department of Public Health as the lead agency in connection with the development of the Management Plan;

WHEREAS, the Management Plan, after completion of a review and concurrence process by local stakeholders, governments and service providers, was submitted to DOE in March 1999 for review and certification, and;

WHEREAS, the Management Plan was certified by the DOE in 2000 as consistent with the intent of WAC 173-100, and;

WHEREAS, under the provisions of RCW 90.44.420, affected local governments are charged with adopting regulations, ordinances and/or programs for implementing those provisions of the Management Plan which are within their respective jurisdictional authorities, and;

WHEREAS, in 2001, the King County Council in Ordinance 14214, codified as King County Code 9.14, formally authorized the County's Groundwater Protection Program and provided for the creation of the Issaquah Creek Valley Groundwater Protection Committee (hereinafter "Committee"), and;

WHEREAS, the current members of the Committee were appointed by the King County executive and confirmed by the King County Council in 2002, and have been routinely meeting since January 2003 to participate in implementation of the Management Plan, and;

WHEREAS, the Management Area lies within all or portions of the City of Issaquah, unincorporated King County, and the Sammamish Plateau Water and Sewer District, each of which is a Party to this Agreement, and;

WHEREAS, the Parties are each considered to be an implementing agency for the Management Plan and for the specific management strategies identified within the Plan, and;

WHEREAS, each of the Parties has a role and responsibility in addressing groundwater issues and concerns in the Management Area, and;

WHEREAS, the current Committee has identified its top priorities for implementation of the Management Plan and for groundwater protection generally within the Management Area; and

WHEREAS, the Parties wish to work together to address and implement the Committee's priorities and to protect groundwater in general, and wish to use King County's services to conduct specific groundwater protection activities, including increased monitoring, enhanced coordination among the Parties, and improved policies and regulations, and;

WHEREAS, the Parties intend that by working cooperatively to conduct the activities provided for in this Agreement they will be taking important steps on behalf of the public to protect the quantity and quality of groundwater in the Management Area, which is threatened by contaminant sources and increasing water supply demand, and;

WHEREAS, pursuant to RCW 39.34, the Interlocal Cooperation Act, each of the Parties is authorized to enter into an agreement for cooperative action;

NOW THEREFORE, the Parties hereto agree as follows:

I. Purpose of the Agreement

The purpose of this Agreement is to provide the means by which the Parties will cooperatively conduct and fund groundwater protection activities. These activities are listed below in four general subject matter areas and will be conducted in the years 2005 through 2007. They are more specifically described in the Scope of Work attached to this Agreement as Exhibit One and incorporated herein and are collectively referred to herein as the "Project." The four activities include:

1. providing staff support to the Committee;
2. evaluating land use and other policies affecting groundwater quality and quantity, and recommending appropriate policy changes or additions to implementing agencies for adoption;
3. developing a steady-state groundwater model of the Management Area; and
4. conducting community education and outreach activities aimed at promoting groundwater awareness and protection.

II. Project Management

- A. Project oversight will be conducted by a Project Management Team (hereinafter "PMT") consisting of one representative each from King County, Issaquah, and the District. Each Party will designate its respective PMT representative.
- B. The PMT will meet at least three times per year as part of meetings of the Committee and will conduct additional meetings as needed to review Project progress, solicit and consider input on the Project from the Committee, and review Project expenditures per the Project budget, and consider possible changes to the Project Scope of Work.
- C. The PMT may make needed changes to the Scope of Work to reflect emerging Project results and findings and to better meet Project objectives. Such

changes shall not cause total annual Project costs as provided for in Exhibit One to be exceeded.

- D. In the case of one or more Parties terminating participation in the Agreement pursuant to Agreement Section VI.B., the PMT shall amend the Scope of Work such that each remaining Party's annual cost share does not exceed the annual dollar amount for that Party shown in the "Project Cost Shares" table as set out on Exhibit One page 10.
- E. Any amended Scopes of Work will be signed by all PMT members to signify agreement with changes.
- F. King County will perform day-to-day project management and direction and communicate with other PMT members as needed to conduct Project activities. Project management activities will include documenting any amended scopes of work for signature by PMT members and providing PMT members with fully signed copies.
- G. King County will schedule, facilitate, and provide summaries of all PMT meetings during implementation of the Project.
- H. The PMT will reach its decisions by consensus, considering input from the Committee where appropriate. Issues that cannot be resolved by the PMT will be referred to the Division Director of the King County Water and Land Resources Division, the City Manager, and the District Manager for final resolution.

III. Responsibilities

- A. Each of the Parties shall:
 - 1. Designate one representative to serve on the PMT and participate in PMT meetings.
 - 2. Maintain its appointed representation on the Committee.
 - 3. Provide for use in the Project any groundwater-related data it has that would be appropriate to share and would facilitate accomplishment of the Project goals.
 - 4. Participate in Groundwater Policy Working Group activities as outlined in the Scope of Work.

5. Consider draft policy recommendations (developed by the Committee) for groundwater protection when and where each party deems it appropriate.
 6. Where appropriate, utilize public outreach tools developed as part of the Project to increase public awareness of groundwater issues.
 7. Pay for its share of Project costs as provided for below and in Exhibit One.
- B. King County shall have the following additional responsibilities:
1. Provide day-to-day Project management.
 2. Perform Project tasks as provided for in Exhibit One, including providing for subcontracted services where needed.
 3. Present a status update (work completed, project schedule, budget, and what remains to be completed) of the work being done under this Interlocal Agreement to Issaquah's City Council at their September Committee of the Whole meeting each year.

IV. Costs

- A. The Parties agree to share costs incurred by King County to conduct Project activities as described in Exhibit One. Total estimated Project costs are \$330,000 for the years 2005-2007.
- B. Estimated Project costs for each year, by activity, are described in Exhibit One.
- C. The Parties agree to pay for Project costs according to the percentages specified in Exhibit One on page 10. Project cost shares will not exceed the dollar amounts shown in the "Project Cost Shares" table as set out on Exhibit One page 10 without written agreement of the Parties.
- D. Total Project costs shall include all those costs incurred by King County in completing the Project, including costs for staff persons, overhead, supplies, contractors, and equipment.

V. Billing and Payment

- A. King County shall bill each of the other Parties quarterly on itemized invoices for that Party's share of Project costs.
- B. The Parties shall review and approve of the invoices and forward payment to King County within 60 days of receipt of invoice.
- C. The Parties represent that funds for service provision under this Agreement have been appropriated and made available. To the extent that such service provision requires future appropriations beyond current appropriation authority, the Parties' obligations are contingent upon the appropriation of sufficient funds to complete the activities described herein. If any Party does not appropriate funds to meet its future obligations for the next fiscal year, its obligations shall terminate at the end of the then-current fiscal year. In the event of such an occurrence, the remaining Parties may terminate their obligations under this Agreement or continue with a modified Scope of Work pursuant to Agreement Section II.D.

VI. Duration, Termination, and Amendment

- A. This Agreement is effective upon signature by the Parties and remains in effect until June 30, 2008.
- B. A Party may end its participation in the Project and withdraw from this Agreement by providing written notice to the other Parties. The date of termination shall be considered to be 45 days after notice of intent to terminate is received by the Parties. A terminating Party shall be responsible for paying its share of Project costs to the date of termination.
- C. This Agreement may be amended, altered, clarified, or extended only by the written agreement of the Parties hereto.
- D. This Agreement is not assignable by any Party, either in whole or in part.
- E. This Agreement is a complete expression of the terms hereto and any oral or written representations or understandings not incorporated herein are excluded. The Parties recognize that time is of the essence in the performance of the provisions of this Agreement. Waiver of any default shall not be deemed to be a waiver of any subsequent default. Waiver of breach of any

provision of this Agreement shall not be deemed to be a waiver of any other or subsequent breach and shall not be construed to be a modification of the terms of the Agreement unless stated to be such through written approval by the Parties which shall be attached to the original Agreement.

VII. Counterparts

This Agreement may be executed in counterparts.

VIII. Indemnification and Hold Harmless

The Parties agree to the following:

Each Party shall protect, defend, indemnify, and save harmless the other Parties, their officers, officials, employees, and agents, while acting within the scope of their employment as such, from any and all costs, claims, judgments, and/or awards of damages, arising out of, or in any way resulting from, that Party's own negligent acts or omissions. Each Party agrees that its obligations under this subparagraph extend to any claim, demand, and/or cause of action brought by, or on behalf of, any of its employees or agents. For this purpose, each Party, by mutual negotiation, hereby waives, with respect to the other Parties only, any immunity that would otherwise be available against such claims under the Industrial Insurance provisions of Title 51 RCW. In the event that any Party incurs any judgment, award, and/or cost arising therefrom, including attorneys' fees, to enforce the provisions of this Article, all such fees, expenses, and costs

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Attachment A

shall be recoverable from the responsible Party to the extent of that Party's culpability.

IN WITNESS WHEREOF, the Parties hereto have executed this Agreement on the _____ day of _____, 2005.

Approved as to Form

King County:

By: _____
Title: Deputy Prosecuting Attorney

By: _____
Title: King County Executive

Approved as to Form

Sammamish Plateau Water and Sewer District:

By: _____
Title: _____

By: _____
Title: _____

Approved as to Form

City of Issaquah:

By: _____
Title: _____

By: _____
Title: _____

15278

Exhibit 1

ISSAQUAH CREEK VALLEY GROUNDWATER MANAGEMENT AREA

PROPOSED SCOPE OF WORK FOR GROUNDWATER PROTECTION SERVICES, 2005-2007

SUMMARY OF SERVICES AND ESTIMATED COSTS

I. WATER RESOURCES EVALUATION

THREE-DIMENSIONAL HYDROGEOLOGIC MAPPING

This effort will be contracted to GeoMapNW at the University of Washington (formerly the Seattle-Area Geologic Mapping Project); DNRP will provide project management and oversight. Only a portion of the Issaquah Creek Valley Groundwater Management Area will be mapped – it is anticipated that the initial mapping area will be an area south of the City of Issaquah including the “Gap” and much of the upper basin of Issaquah Creek.

- Compile existing boring data for the study area.
- Enter data for the study area into a georeferenced database.
- Map hydrogeologic data and susceptibility for the study area.

Estimated Cost	Hydrogeologic Mapping	\$32,390
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ISSAQUAH CREEK VALLEY GROUNDWATER DATA WEB PAGES

- Develop GWMA groundwater data Web pages on the King County Web site.
- Compile available groundwater data for the Issaquah Creek Valley Groundwater Management Area (GWMA) from all available sources, as budget allows.
- Update the Web pages when new information becomes available.

Estimated Cost	Web Site	\$13,400
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EXEMPT WELL IMPACT ASSESSMENT

- Develop data and approach for multiple areas within the GWMA and method for GWMA-wide application
- Apply approach for exempt wells.
- Apply similar approach for larger (permitted) wells.

Estimated Cost	Exempt Well Impact	\$2,000
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GROUNDWATER MODEL VALIDATION, COMPARISON, AND EXTENSION

- Compile data and conduct initial model assessment for multiple areas across the GWMA in order to cover as much GWMA area as possible.
- Validate models and planning.
- Develop plans for further modeling and monitoring.

Estimated Cost	Groundwater Model	\$33,600
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Water Resources Evaluation Total Estimated Cost, 2005-2007		\$150,390
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II. POLICY AND PLAN IMPLEMENTATION

GROUNDWATER PROTECTION COMMITTEE AND ILA MANAGEMENT

- Maintain an Issaquah Creek Valley Groundwater Protection Committee membership roster.
- Facilitate appointments for vacant committee seats.
- Handle committee logistics such as scheduling meetings and guest speakers, securing facilities, and posting public notices.
- Staff and support regular meetings of the committee.
- Develop meeting agendas in partnership with committee chairs.
- Produce meeting notes.
- Distribute notes, agendas, and other communications to committee members and interested parties.
- Serve as the liaison between the committee and the groundwater protection service providers.
- Manage and oversee completion of ILA services.
- Convene an ILA management group as needed.
- Coordinate routine status reports of progress on the ILA scope of work.
- Facilitate committee review of work performed under the ILA.

Estimated Cost - Committee and ILA Management (\$25,305/year)	\$76,305
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GROUNDWATER POLICY WORK GROUP

- Convene a multi-agency work group to research and draft groundwater protection policy and model legislation.
- Handle logistics for the work group, such as scheduling meetings, securing facilities, and posting public notices.
- Research and analyze groundwater policy issues identified by the Issaquah Creek Valley Groundwater Protection Committee, such as exempt wells, stormwater, Low Impact Development, and cross-jurisdictional coordination on aquifer protection.

Estimated Cost - Policy Work Group (\$20,450/year)	\$61,305
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Policy and Plan Implementation Total Estimated Cost, 2005-2007	\$137,610
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III. EDUCATION AND OUTREACH

PUBLIC AWARENESS

- Expand public awareness of key groundwater issues identified by the Issaquah Creek Valley Groundwater Protection Committee and/or the Issaquah Creek Valley Policy Work Group within targeted locations and also across the GWMA for some issues.
- Utilize a variety of mediums – such as public events, newsletter articles, brochures, information sheets, Web-based information, and workshops – to convey key messages to broad GWMA-wide population.

Estimated Cost – Public Awareness (\$10,000/year)	\$30,000
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NATURAL YARD CARE

- Select target neighborhood(s) within the GWMA in partnership with the Issaquah Creek Valley Groundwater Protection Committee.
- Solicit participants.
- Conduct training workshops on Natural Yard Care, plus added GWMA-specific topics like Low Impact Development or stormwater.
- Conduct participant surveys both before and after training.
- Share survey results with the Issaquah Creek Valley Groundwater Protection Committee.

Estimated Cost (one series/year) – Natural Yard Care (\$2,000/series)	\$2,000
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Education and Outreach Total Estimated Cost, 2005-2007	\$42,000
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TOTAL FOR ALL SERVICES 2005-2007	\$380,000
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ISSAQUAH CREEK VALLEY GROUNDWATER MANAGEMENT AREA

PROPOSED SCOPE OF WORK FOR GROUNDWATER PROTECTION SERVICES, 2005-2007

DETAIL OF SERVICES AND ESTIMATED COSTS

Groundwater is important to the Issaquah Creek Valley Groundwater Management Area (GWMA) for the following two key reasons:

- Almost the entire population of the GWMA relies to a great extent on groundwater as its source of drinking water supply. Of the 10 Group A purveyors with defined service areas, all but two (KCWD 90 and Cedar River Water and Sewer, both along the edges of the Groundwater Management area) use mostly or solely groundwater. However, some large sections of the management area have no water service providers designated. Residences outside of these defined water system service areas must obtain supplies from groundwater via approximately 16 other Group A systems, 245 Group B systems, or individual exempt wells.
- Groundwater is essential for sustaining habitat in the area's rivers and wetlands.

Groundwater supplies can be precarious. For example, when drought conditions reduced the flow in the North Fork Issaquah Creek, flows needed to be diverted from water supply wells to restore some flow to the system. In addition, a large part of the area is designated rural and uses on-site sewage treatment (septic) systems, which discharge directly to groundwater.

All the rivers in the GWMA depend completely on groundwater storage (rather than snowmelt) to continue their flows through the dry summer months. Fish need the cold water from groundwater to migrate and spawn.

The Issaquah Creek Valley Groundwater Protection Committee has been discussing priorities for the King County Groundwater Protection Program in its GWMA. The committee has worked to identify top priorities with the expectation that implementing agencies will use these priority statements to guide their provision of groundwater protection services.

Key implementing agencies are the City of Issaquah, the King County Department of Natural Resources and Parks (DNRP), the King County Department of Development and Environmental Services, Public Health - Seattle & King County, water purveyors, and the Washington State Department of Ecology.

Based on direction from the groundwater protection committee, King County proposes a water resources evaluation, policy and plan implementation services, and education and outreach to help protect this groundwater in the Issaquah Creek Valley Groundwater Management Area.

I. WATER RESOURCES EVALUATION

PRIORITIES AND OBJECTIVES

The Issaquah Creek Valley Groundwater Protection Committee identified the following as some of the most important groundwater data issues:

- Characterize area geology/hydrogeology.
- Assess possible interactions among different aquifers, such as across the "gap" between the upper and lower Issaquah Creek Basins, and between surface water and groundwater.

- Update, link, validate, and extend separate previous groundwater models already developed for purveyors.
- Estimate numbers of exempt wells and their impact.
- Develop updated CARA maps.

A major limitation with the existing data is its fragmentation – data that has been developed for one purveyor has generally not been available to others. A second constraint is that data have been compiled mostly in limited areas, such as in the main Issaquah Valley where the largest water supply wells are located. DNRP will compile groundwater/geologic data from previous studies, including modeling studies. While it will ultimately be valuable to gather new data through monitoring, and to develop new groundwater models, such efforts will be delayed until later years.

The compilation will include use of three-dimensional mapping techniques developed by the University of Washington research group GeoMapNW. It will also include use of data from purveyors, GeoMapNW, and the Washington State Department of Ecology to estimate numbers and distribution of, and consumption by, exempt wells and other (permitted) groundwater users. The existing groundwater models will be assessed against new data and understandings in order to develop combined and more comprehensive model applications. Finally, all the data will be made available to the public via technical Web pages on the King County Web site.

EXISTING SOURCES OF GROUNDWATER DATA

There are a number of existing sources of groundwater data for the GWMA:

- The Area Characterization work for the Issaquah Creek Valley Groundwater Management Plan provides the overall basis of the hydrogeology of the GWMA, although the data for variable conditions (water levels and water quality) are not current.
- Ambient groundwater monitoring by DNRP has updated the water quality and water level data for many of the wells covered by the management plan, but there are many other wells that might not be included in this update.
- A limited number of hydrogeologic studies have been conducted in the GWMA, mainly for purveyors such as the Sammamish Plateau Water and Sewer District. Hydrogeologic wellhead protection plans have been developed for the Sammamish Plateau Water and Sewer District as well as for other purveyors, although it is uncertain how many of these plans were based on recently acquired information. The large systems (City of Issaquah, and Sammamish Plateau Water and Sewer District) have electronic data compilation systems that record flows and water levels at frequent intervals. A solicitation to the purveyors may provide some new reports on the hydrogeology of the GWMA.
- Groundwater flow models have been developed for the City of Issaquah (Golder Associates, 1997) and for the Sammamish Plateau Water and Sewer District (CDM consultants). Newer data since the models were developed will allow the existing models to be reassessed and validated.
- The Issaquah Highlands development has had a number of monitoring wells installed to assure that groundwater impacts are minimized. Recent slope stability problems have required reassessment of some of the parameters or analyses done for this existing development.
- The Washington State Department of Ecology has made its well log data available via the Internet, a capability that was not possible at the time of the previous studies. Other data sets are also available, including topographic mapping using LiDAR.

These data are not comprehensive or completely up to date. More significantly, the data are fragmented and have not been assessed in their totality. While it would be valuable to collect new data in order to address the priorities listed above and meet the stated objectives, it appears more important to first compile and assess the existing data.

PROPOSED SERVICES

To address the Issaquah Creek Valley Groundwater Protection Committee's data priorities, King County proposes that the committee invest in a three-year water resources evaluation for the groundwater management area ("study area"). This evaluation would ultimately provide data to inform decision-makers about the impact of land-use changes, water withdrawals, and climate change on groundwater supplies within the study area. This data set could be used to help develop a long-term monitoring strategy for groundwater in the area and identify future needs for modeling.

To deal with the GWMA's disparate groundwater issues, it is necessary to re-evaluate all previous data in a critical way, using new methodologies where applicable. DNRP has the advantage, as does the University of Washington, of being an independent technical agency without regulatory threat to users. As such, DNRP can bridge the various authorities and data sources.

By first compiling data from the multiple sources into a single database location, DNRP will be able to reassess new approaches for the issues discussed above. The existing groundwater models can be validated using the newer data and methods, such as LiDAR mapping that were not available when the models were initially developed. Data for the upper Issaquah Creek basin can be used to see what sort of groundwater flow regime may exist through the "Gap," and allow new boundary conditions to be applied to models in the main Issaquah valley.

DNRP will contract with the University of Washington research group GeoMapNW (formerly the Seattle-Area Geologic Mapping Project) to create three-dimensional (surface and subsurface) geologic mappings to characterize the mapping area's hydrogeology. This study provides the basis for eventual new groundwater modeling within the study area and will also be used to develop new susceptibility maps for CARA.

Because of limitations in funding, GeoMapNW will focus on updating the geologic data in an area south of the City of Issaquah including the "Gap" and upper basin of Issaquah Creek. Mapping of the other areas will be left for subsequent years. Because of the costs involved and the large areas of the GWMA without previous studies, it is necessary to break out these mapping efforts over several years. If additional partners or funding sources can be developed, the mapping effort will be accelerated and the geographic area extended. DNRP will work with the University of Washington to further prioritize and schedule their efforts.

Other sources of data compiled in the first year of the water resources evaluation (2005) will be used to develop an approach to estimate the number of exempt wells in the GWMA and to estimate their impact on the groundwater resources. This approach will be applied in the second year (2006). Similar estimates will be conducted on the larger, permitted groundwater withdrawals in 2007.

All the data that is developed in this water resources evaluation will be made available to the public via Web pages on the King County Web site. This will allow purveyors, members of the consulting community, and the interested public to utilize the data as it becomes available.

THREE-DIMENSIONAL HYDROGEOLOGIC MAPPING

This effort will be contracted to GeoMapNW at the University of Washington (formerly the Seattle-Area Geologic Mapping Project); DNRP will provide project management and oversight. Only a portion of the Issaquah Creek Valley Groundwater Management Area will be mapped – it is anticipated that the initial mapping area will involve an area south of the City of Issaquah including the "Gap" and upper basin of Issaquah Creek. The three main tasks required to complete the mapping are described below.

Task 1: Compile Data

Compile existing boring data for the mapping area.

Task 2: Enter Data

Enter data for the mapping area into a georeferenced database.

Task 3: Make Estimations

Estimate hydrogeologic data and map susceptibility for the mapping area.

ISSAQUAH CREEK VALLEY GROUNDWATER DATA WEB PAGES

The three main tasks required to complete the Web pages are described below.

Task 1: Develop the Web Site (2005)

Develop GWMA groundwater data web pages on the King County website, which will provide public access to data and other information about the water resources evaluation.

Task 2: Compile Data (2005-2007)

ICV GWMA-specific data will be compiled from existing sources and input into the database to the extent permitted by annual budgeted funds.

Task 3: Update the Web Site (2006, 2007)

Update the Web pages when new information becomes available.

EXEMPT WELL IMPACT ASSESSMENT

The three main tasks required to complete the well assessment are described below.

Task 1: Develop Data and Approach (2005)

Pilot subareas for the assessment that are deemed to have the greatest informational value will be identified by King County staff and approved by the PMT. After compiling data from purveyors, the state departments of Ecology and Health, and earlier-developed data from GeoMapNW, the numbers of exempt wells in pilot subareas will be calculated. Data for each subarea will include the following (at a minimum):

- historic numbers of exempt wells installed, on an annual basis
- sizes of systems (number of connections) and consumption rates, both exempt and permitted
- numbers/locations of users on systems
- total number of residences
- residences with no identified water supply.

Field surveys may be necessary to validate this approach.

Data will be organized via GIS, using King County GIS coverages, to estimate the total number of developed residential parcels.

Task 2: Apply Approach for Exempt Wells (2006)

Apply methods developed in Task 1 to additional representative subareas, chosen on availability of data (e.g., billing lists) and results of pilot applications. Extrapolate to entire basins.

Task 3: Apply Similar Approach for Larger (Permitted) Wells (2007)

Data developed will allow estimation of actual consumption of larger Group B systems. Data from metered Group A systems, and users of irrigation, industrial, and agricultural water supplies will be included in this process.

GROUNDWATER MODEL VALIDATION, COMPARISON, AND EXTENSION

The two existing groundwater models (City of Issaquah, and Sammamish Plateau Water & Sewer District) will be assessed against newer data and hydrogeologic understanding. The three main tasks required to complete the modeling are described below.

Task 1: Compile Data and Conduct Initial Model Assessment (2005)

- Obtain and assess information about existing models. Data and concepts for the models will be compiled as part of the overall data compilation.
- Compare results and assumptions against newer data. New information from the areas surrounding the existing model areas (for example Issaquah and Sammamish Plateau model areas), including LiDAR topography, will be reviewed to assess model assumptions.
- Investigate flow conditions in adjacent geographic areas into the existing models, including along the Issaquah Creek "gap."

Task 2: Validate Models and Planning (2006)

The data and concepts for the models will be pared against actual data. Validation runs of the models will probably be required. Because models have proprietary components, additional consultant costs may be incurred as part of this task.

Task 3: Develop Plans for Further Modeling and Monitoring (2007)

Based on the results of Task 2, a plan will be developed for additional modeling in subsequent years. According to the data gaps that will (undoubtedly) be found, a monitoring plan will be prepared to fill in the necessary information.

WATER RESOURCES EVALUATION DELIVERABLES**Table 1. Water Resources Evaluation Proposed Deliverables by Year**

Year	Deliverables
2005	<ul style="list-style-type: none"> • Compilation report for groundwater data from previous studies, including assessment of existing models • Initiation of geologic mapping (3-D database) • GWMA groundwater data Web pages • Approach to exempt well questions
2006	<ul style="list-style-type: none"> • Continuation of geologic mapping, new areas (to be determined) • Report of application of exempt well approach, and estimates of numbers and impacts • Validation report for existing groundwater models, and plan for combination and extension
2007	<ul style="list-style-type: none"> • 3-D geologic database mapping continues, possibly of the Sammamish Plateau to allow update of Sammamish Plateau models. • Estimation of impacts from larger (permitted) withdrawals • Modeling and monitoring plan

WATER RESOURCES EVALUATION ESTIMATED COSTS

The total estimated cost for the Water Resources Evaluation is \$159,390 over three years.

Table 2. Water Resources Evaluation Estimated Costs by Work Item

Work Item	Labor (FTE)	Material Lab. or Consultant Costs	Total Cost
Geologic Mapping	0.10	\$68,390	\$82,390
Groundwater Data Web Pages	0.09	----	\$13,400
Exempt Wells Impact Assessment	0.15	----	\$21,000
Groundwater Model Validation, Comparison, and Extension	0.24	----	\$33,600
TOTAL	0.58	\$68,390	\$150,390

*Labor costs are based on \$140,000 per FTE per year; labor costs may vary.

Table 3. Water Resources Evaluation Estimated Costs by Year

Year	Work Item/Task	Labor (FTE)	Material Lab. or Consultant Costs	Total Cost
2005	Geologic mapping – upper Issaquah Creek valley	0.05	\$45,130	\$52,130
2005	Develop GWMA web pages on King County website; begin data compilation	0.07	----	\$11,000
2005	Exempt well approach	0.05	----	\$7,000
	2005 Total	0.17	\$45,130	\$70,130.00
2006	Geologic mapping	0.0	\$8,130	\$8,130
2006	Web pages update and maintenance	0.01	----	\$1,200
2006	Application of exempt well approach	0.10	----	\$14,000
2006	Validation of existing model	0.12	----	\$16,800
	2006 Total	0.23	\$8,130	\$40,130.00
2007	Geologic mapping	0.05	\$15,130	\$22,130
2007	Web pages update and maintenance	0.01	----	\$1,200
2007	Development of modeling/monitoring plans	0.12	----	\$16,800
	2007 Total	0.18	\$15,130	\$40,130.00
	TOTAL	0.58	\$68,390	\$150,390

*Labor costs are based on \$140,000 per FTE per year; labor costs may vary.

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Exhibit 1

Project Cost Shares

Partner	2005 Cost Share Percentage	2005 Estimated Cost (\$)	2006 Cost Share Percentage	2006 Estimated Cost (\$)	2007 Cost Share Percentage	2007 Estimated Cost (\$)	TOTAL ESTIMATED COST (\$)
King County	38.5%	50,000	50%	50,000	50%	50,000	150,000
City of Issaquah	38.5%	50,000	35%	35,000	35%	35,000	120,000
Sammamish Plateau Water and Sewer District	23%	30,000	15%	15,000	15%	15,000	60,000
Totals	100%	130,000	100%	\$100,000	100%	\$100,000	\$330,000

ICV Groundwater ILA Services Budget

Year:	2005	2006	2007	annual	FTE
Water Resources Evaluation					
Geologic Mapping	\$52,130	\$8,130	\$22,130		0.05
Web Pages	\$11,000	\$1,200	\$1,200		0.07
Exempt Wells Impact Assessment	\$7,000	\$14,000	\$0		0.05
Model Validation	\$0	\$16,800	\$16,800		0.12
Water Resources Evaluation subtotal	\$70,130.00	\$40,130.00	\$40,130.00		0.32
Policy and Plan Implementation					
GWPC & ILA Management	\$25,435	\$25,435	\$25,435		0.15
Policy Work Group	\$20,435	\$20,435	\$20,435		0.14
Policy/Plan subtotal	\$45,870	\$45,870	\$45,870		0.29
Education and Outreach					
Public Awareness	\$10,000	\$10,000	\$10,000		0.06
Natural Yard Care	\$4,000	\$4,000	\$4,000		0.03
Education subtotal	\$14,000	\$14,000	\$14,000		0.09
Total ICV Program Budget	\$130,000	\$100,000	\$100,000		.7

(.0 in '06)
 (.01 in '06, '07)
 (.10 in '06) plus UW

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2005-317 Attachment B

**INTERLOCAL AGREEMENT
FOR GROUNDWATER PROTECTION AND MANAGEMENT ACTIVITIES
IN THE REDMOND-BEAR CREEK GROUNDWATER MANAGEMENT AREA**

This Agreement is entered into by King County, Washington, hereinafter referred to as "King County" or the "County," the City of Redmond, hereinafter referred to as "Redmond," and the City of Woodinville, hereinafter referred to as "Woodinville," collectively referred to as the "Parties," for the purpose of cooperatively conducting activities related to groundwater protection and management in the Redmond-Bear Creek Groundwater Management area.

WHEREAS, the Washington State Department of Ecology (DOE) has been authorized by RCW 90.44.400 and its implementing regulations, WAC 173-100, to identify and designate groundwater management areas for the purposes of protection of water quality, assurance of quantity, and efficient management of water resources to meet future needs, and;

WHEREAS, in 1986 DOE designated the Redmond-Bear Creek Groundwater Management Area (hereinafter "Management Area"), and;

WHEREAS, DOE designated the Seattle/King County Department of Public Health as the lead agency to work with stakeholders and potential implementing agencies to develop the Redmond-Bear Creek Valley Groundwater Management Plan (hereinafter "Management Plan"), and;

WHEREAS, in 1996 the King County Department of Natural Resources replaced the Seattle/King County Department of Public Health as the lead agency in connection with the development of the Management Plan;

WHEREAS, the Management Plan, after completion of a review and concurrence process by local stakeholders, governments and service providers, was submitted to DOE in March 1999 for review and certification, and;

WHEREAS, the Management Plan was certified by the DOE in 2000 as consistent with the intent of WAC 173-100, and;

WHEREAS, under the provisions of RCW 90.44.420, affected local governments are charged with adopting regulations, ordinances and/or programs for implementing those provisions of the Management Plan which are within their respective jurisdictional authorities, and;

WHEREAS, in 2001, the King County Council in Ordinance 14214, codified as part of King County Code 9.14, formally authorized the County's Groundwater Protection Program and in Ordinance 14276, codified as part of King County Code 9.14, formally provided for the

creation of the Redmond-Bear Creek Groundwater Protection Committee (hereinafter "Committee"), and;

WHEREAS, the current members of the Committee were appointed by the King County executive and confirmed by the King County Council in 2002, and have been routinely meeting since December 2002 to participate in implementation of the Management Plan, and;

WHEREAS, the Management Area lies within all or portions of King County and the cities of Redmond and Woodinville, each of which is a Party to this Agreement, and;

WHEREAS, the Parties are each considered to be an implementing agency for the Management Plan and for the specific management strategies identified within the Plan, and;

WHEREAS, each of the Parties has a role and responsibility in addressing groundwater issues and concerns in the Management Area, and;

WHEREAS, the current Committee has identified its top priorities for implementation of the Management Plan and for groundwater protection generally within the Management Area; and

WHEREAS, the Parties wish to work together to address and implement the Committee's priorities and to protect groundwater in general, and wish to use King County's services to conduct specific groundwater protection activities, including increased monitoring, enhanced coordination among the Parties, and improved policies and regulations, and;

WHEREAS, the Parties intend that by working cooperatively to conduct the activities provided for in this Agreement they will be taking important steps on behalf of the public to protect the quantity and quality of groundwater in the Management Area, which is threatened by contaminant sources and increasing water supply demand, and;

WHEREAS, pursuant to RCW 39.34, the Interlocal Cooperation Act, each of the Parties is authorized to enter into an agreement for cooperative action;

NOW THEREFORE, the Parties hereto agree as follows:

I. Purpose of the Agreement

The purpose of this Agreement is to provide the means by which the Parties will cooperatively conduct and fund groundwater protection activities. These activities are listed below in four general subject matter areas and will be conducted in the years 2005 through 2007. They are more specifically described in the Scope of Work attached to this Agreement as Exhibit One and incorporated herein and are collectively referred to herein as

the "Project." The four activities include:

1. providing staff support to the Committee;
2. evaluating land use and other policies affecting groundwater quality and quantity;
3. obtaining additional hydrogeologic data for the Management Area; and
4. conducting community education and outreach activities aimed at promoting groundwater awareness and protection and facilitating an annual groundwater education forum.

II. Project Management

- A. Project oversight will be conducted by a Project Management Team (hereinafter "PMT") consisting of one representative each from King County, Redmond, and Woodinville. Each Party will designate its respective PMT representative.
- B. The PMT will meet at least three times per year and will conduct additional meetings as needed to review Project progress, solicit and consider input on the Project from the Committee, and review Project expenditures per the Project budget, and consider possible changes to the Project Scope of Work.
- C. The PMT may make needed changes to the Scope of Work to reflect emerging Project results and findings and to better meet Project objectives. Such changes shall not cause total annual Project costs as provided for in Exhibit One to be exceeded.
- D. In the case of one or more Parties terminating participation in the Agreement pursuant to Agreement Section VI.B., the PMT shall amend the Scope of Work such that each remaining Party's annual cost share does not exceed the dollar amount for that Party shown in the "Project Cost Shares" table as set out on Exhibit One page 11.
- E. In the case that insufficient additional revenues are received that are otherwise anticipated to cover Project Costs, as described in Agreement Section IV., the PMT shall amend the Scope of Work to reduce Project costs by the amount of additional revenue not received.
- F. Any amended Scopes of Work must be signed by all PMT members to become effective.
- G. King County will perform day-to-day project management and direction and communicate with other PMT members as needed to conduct Project activities. Project management activities will include processing any amendments to the Scope of Work

for signature by PMT members and providing PMT members with fully executed copies.

- H. King County will schedule, facilitate, and provide summaries of all PMT meetings during implementation of the Project.
- I. The PMT will reach its decisions by consensus, considering input from the Committee where appropriate. Issues that cannot be resolved by the PMT will be referred to the Division Director of the King County Water and Land Resources Division and the appropriate City Managers for final resolution.

III. Responsibilities

A. Each of the Parties shall:

- 1. Designate one representative to serve on the PMT and participate in PMT meetings.
- 2. Maintain its appointed representation on the Committee.
- 3. Provide for use in the Project any groundwater-related data it has that would be appropriate to share and would facilitate accomplishment of the Project goals.
- 4. Participate in the Groundwater Education Forum as outlined in the Scope of Work.
- 5. Consider revising its groundwater protection policies and regulations to increase groundwater protection when and where it deems appropriate as recommended by the Committee.
- 6. Where appropriate, utilize public outreach tools developed as part of the Project to increase public awareness of groundwater issues.
- 7. Pay for its share of Project costs as provided for below and in Exhibit One.

B. King County shall have the following additional responsibilities:

- 1. Provide day-to-day Project management.
- 2. Perform Project tasks as provided for in Exhibit One, including providing for subcontracted services where needed.
- 3. Act as fiscal agent for any additional revenues received, pursuant to Agreement Section IV. D.

IV. Costs

- A. The Parties agree to share costs incurred by King County to conduct Project activities as described in Exhibit One. Total estimated Project costs are \$618,831 for the years 2005-2007.
- B. Estimated Project costs for each year, by activity, are described in Exhibit One.
- C. The Parties agree to pay for Project costs according to the percentages specified in Exhibit One on page 11. Project cost shares for each Party will not exceed the dollar amounts shown for each Party in the "Project Cost Shares" table as set out on Exhibit One page 11, without written agreement of the Parties.
- D. As indicated on the "Project Cost Shares" table on Exhibit One, a portion of revenues to cover Project costs are intended to be covered by revenues that may be forthcoming from additional revenue sources such as grants. King County is designated to be the fiscal agent to receive any additional revenue and apply it to Project costs.
- E. Total Project costs shall include all those costs incurred by King County in completing the Project, including costs for staff persons, overhead, supplies, contractors, and equipment.

V. Billing and Payment

- A. King County shall bill each of the other Parties quarterly on itemized invoices for that Party's share of Project costs.
- B. The Parties shall review and approve of the invoices and forward payment to King County within 60 days of receipt of invoice.
- C. The Parties represent that funds for service provision under this Agreement have been appropriated and made available. To the extent that such service provision requires future appropriations beyond current appropriation authority, the Parties' obligations are contingent upon the appropriation of sufficient funds to complete the activities described herein. If any Party does not appropriate funds to meet its future obligations for the next fiscal year, its obligations shall terminate at the end of the then-current fiscal year. In the event of such an occurrence, the remaining Parties may terminate their obligations under this Agreement or continue with a modified Scope of Work pursuant to Agreement Section II.D.

VI. Duration, Termination, and Amendment

- A. This Agreement is effective upon signature by the Parties and remains in effect until June 30, 2008.
- B. A Party may end its participation in the Project and withdraw from this Agreement upon at least 90 days' written notice to the other Parties, and paying its share of costs for the Project to the end of the quarter in which termination is effective.
- C. This Agreement may be amended, altered, clarified, or extended only by the written agreement of the Parties hereto.
- D. This Agreement is not assignable by any Party, either in whole or in part.
- E. This Agreement is a complete expression of the terms hereto and any oral or written representations or understandings not incorporated herein are excluded. The Parties recognize that time is of the essence in the performance of the provisions of this Agreement. Waiver of any default shall not be deemed to be a waiver of any subsequent default. Waiver of breach of any provision of this Agreement shall not be deemed to be a waiver of any other or subsequent breach and shall not be construed to be a modification of the terms of the Agreement unless stated to be such through written approval by the Parties which shall be attached to the original Agreement.

VII. No Employment Relationship Created

The Parties shall be and remain solely responsible for their own officials, officers and employees under this Agreement. No official, officer or employee of any party hereto shall be deemed to be an employee of any other party.

VIII. Counterparts

This Agreement may be executed in counterparts.

IX. Indemnification and Hold Harmless

The Parties agree to the following:

Each Party shall protect, defend, indemnify, and save harmless the other Parties, their officers, officials, employees, and agents, while acting within the scope of their employment as such, from any and all costs, claims, judgments, and/or awards of damages, arising out of, or in any way resulting from, that Party's own negligent acts or omissions. Each Party agrees that its obligations under this subparagraph extend to any

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claim, demand, and/or cause of action brought by, or on behalf of, any of its employees or agents. For this purpose, each Party, by mutual negotiation, hereby waives, with respect to the other Parties only, any immunity that would otherwise be available against such claims under the Industrial Insurance provisions of Title 51 RCW. In the event that any Party incurs any judgment, award, and/or cost arising therefrom, including attorneys' fees, to enforce the provisions of this Article, all such fees, expenses, and costs shall be recoverable from the responsible Party to the extent of that Party's culpability.

IN WITNESS WHEREOF, the Parties hereto have executed this Agreement on the _____ day of _____, 2005.

Approved as to Form

King County:

By: _____
Title: Deputy Prosecuting Attorney

By: _____
Title: King County Executive

Approved as to Form

City of Redmond:

By: _____
Title: _____

By: _____
Title: _____

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Approved as to Form

City of Woodinville:

By: _____

By: _____

Title: _____

Title: _____

REDMOND-BEAR CREEK VALLEY GROUNDWATER MANAGEMENT AREA

SCOPE OF WORK FOR GROUNDWATER PROTECTION SERVICES, 2005-2007

SUMMARY OF SERVICES AND ESTIMATED COSTS

I. WATER RESOURCES EVALUATION

SURFACE WATER/GROUNDWATER INTERACTION STUDY (2005-2007)

Geographic scope is subareas within and adjacent to GWMA

- Review previous studies.
- Develop a work plan and present it to the Redmond-Bear Creek Groundwater Protection Committee.
- Install temperature probes and mini-piezometers, and utilize other monitoring methods.
- Observe water levels and temperature fluctuations.
- Calculate interaction factors between surface water and groundwater.

Estimated Cost - Interaction Study	\$24,600
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STREAM FLOW AND PRECIPITATION GAGING (2005-2007)

Geographic scope is a number of subareas across the GWMA

- Continue stream flow and precipitation monitoring.
- Install new gages as possible.
- Provide data via DNRP hydrology Web pages.

Estimated Cost - Gaging	\$2,000
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GEOLOGIC AND SUSCEPTIBILITY MAPPING (2005-2007)

Geographic scope is subareas within and adjacent to the GWMA

- The mapping area will be sub-areas of the Redmond-Bear Creek Valley Groundwater Management Area and adjacent areas (likely to include Cold Creek and Upper Bear Creek areas). The PMT to approve final mapping area.
- Collect subsurface geologic data (such as borehole or well logs) for mapping study area from current sources.
- Provide a database that includes both groundwater data and a list of boring logs in the mapping area.
- Perform geologic field mapping in the mapping area.
- Develop and verify geologic units for interpretation of maps and cross-sections of the mapping area.
- Update previous geologic mapping (to a 1:24,000 scale) and create geologic cross-sections for mapping area.
- Map high, medium or low susceptibility to groundwater contamination in mapping area.

Estimated Cost - Geologic Mapping	\$89,000
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REDMOND-BEAR CREEK VALLEY GROUNDWATER DATABASE/WEB PAGES (2005-2007)

Geographic scope is entire GWMA

- Compile existing data.
- Program the Web pages to allow interactive data downloading.
- Update information on an annual basis.

Estimated Cost - Database/Web Pages	\$5,400
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Water Resources Evaluation Total Estimated Cost 2005-2007	\$456,000
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II. POLICY AND PLAN IMPLEMENTATION

GROUNDWATER PROTECTION COMMITTEE AND ILA MANAGEMENT (2005-2007)

- Maintain a Redmond-Bear Creek Groundwater Protection Committee membership roster.
- Facilitate appointments for vacant committee seats.
- Handle committee logistics such as scheduling meetings and guest speakers, securing facilities, and posting public notices.
- Staff and support regular meetings of the committee.
- Develop meeting agendas in partnership with committee chairs.
- Produce meeting notes.
- Distribute notes, agendas, and other communications to committee members and interested parties.
- Serve as the liaison between the committee and the groundwater protection service providers.
- Manage and oversee completion of ILA services.
- Convene an ILA management group as needed.
- Coordinate routine status reports of progress on the ILA scope of work.
- Facilitate committee review of work performed under the ILA.

Estimated Cost - Committee and ILA Management (\$18,361/year) \$55,083

GROUNDWATER POLICY AND SUBCOMMITTEE WORK (2005-2007)

- Research and analyze groundwater policy issues as identified by the Redmond-Bear Creek Groundwater Protection Committee.
- Develop policy guidance for implementing agencies in topical areas of interest to the committee.
- Provide organizational support to subcommittees as needed.

Estimated Cost - Policy and Subcommittee Work (\$7,587/year) \$22,561

Policy and Plan Implementation Total Estimated Cost, 2005-2007 (\$26,148/year) \$78,444

III. EDUCATION AND OUTREACH

UPDATE TO EDUCATION WEB PAGES (2005-2007)

- Post geographically relevant survey data on the groundwater education Web pages of the King County Web site.
- Using an existing format, maintain a list of groundwater materials with info submitted by Redmond-Bear Creek Valley Groundwater Management Area jurisdictions and agencies.
- Link to Snohomish County's groundwater program and to Cross Valley Water District as appropriate.
- Include links to King County, Washington State, and Federal agency materials.
- Request and integrate updates from groundwater education participants.

Estimated Cost - Web Pages (\$2,327/yr) \$9,846

EDUCATORS FORUM (2005-2007)

- Work directly with the Redmond-Bear Creek Groundwater Protection Committee.
- Coordinate logistics for the annual forum.
- Create a mailing list.
- Publicize the forum.
- Facilitate the forum.
- Participate in the forum and share King County groundwater education issues.
- Provide water quality survey results via zip-code sorting to track attitudes and behaviors.
- Prepare and present Educators Forum recommendations to the committee for comment and approval.

Estimated Cost - Educators Forum (\$16,563/yr) \$70,896

WRITING AND EDITING (2005-2007)

- Submit quarterly articles to community newsletters and other entities for publication. Topics may include the following:
 - things citizens and businesses can do to improve groundwater recharge
 - vulnerability
 - wellhead protection
 - underground storage tank maintenance
 - scientific findings
 - groundwater's role in the hydrologic cycle
 - groundwater as drinking water.

Estimated Cost - Writing and Editing (\$8,227/yr) \$24,846

Education and Outreach Total Estimated Cost 2005-2007 (\$28,129/yr) \$84,887

**REDMOND-BEAR CREEK VALLEY
GROUNDWATER MANAGEMENT AREA
PROPOSED SCOPE OF WORK FOR GROUNDWATER PROTECTION
SERVICES, 2005-2007**

DETAIL OF SERVICES AND ESTIMATED COSTS

Groundwater is important to the Redmond-Bear Creek Valley Groundwater Management Area (GWMA) in large part for the following two key reasons:

- A large portion of the population of the GWMA relies on groundwater as its source of drinking water supply. Of the Redmond supply, 40 percent comes from groundwater; of the Union Hill Water Association, and the Northeast Sammamish Sewer and Water District supplies, 100 percent come from groundwater. Beyond these large systems, approximately 100 small (Group B) public water systems rely entirely groundwater.
- Groundwater is essential for sustaining habitat in the area's rivers and wetlands.

These crucial groundwater supplies can be precarious. Much of the upper Bear Creek Basin area uses on-site sewage treatment (septic) systems, which discharge directly to groundwater. In densely populated areas, there has been concern about impacts from these systems to groundwater quality.

All the rivers and streams in the GWMA (such as the Sammamish River, Bear Creek, and Evans Creek) are entirely lowland, and therefore are not sustained by snowmelt. The rivers and streams are completely dependent on groundwater storage to continue their flows through the dry summer months. Fish need the cold water from groundwater to migrate and spawn.

The Redmond-Bear Creek Groundwater Protection Committee has been discussing priorities for the King County Groundwater Protection Program in its GWMA. The committee has worked to identify top priorities with the expectation that implementing agencies will use these priority statements to guide their provision of groundwater protection services.

Key implementing agencies are the Cities of Redmond and Woodinville; local water utilities and districts; the King County Department of Natural Resources and Parks (DNRP); the King County Department of Development and Environmental Services; Public Health - Seattle & King County; water purveyors; and the Washington State Department of Ecology.

Based on direction from the groundwater protection committee, King County proposes a water resources evaluation, policy and plan implementation services, and education and outreach to help protect groundwater in the Redmond-Bear Creek Valley Groundwater Management Area.

I. WATER RESOURCES EVALUATION

PRIORITIES AND OBJECTIVES

The Redmond-Bear Creek Groundwater Protection Committee identified the following as the most important groundwater data issues:

- Identify areas of surface water and groundwater interaction. Much of the shallow groundwater appears to be in direct communication with Bear Creek, Evans Creek, Cottage Lake Creek, Cold Creek, or other streams, all of which contain significant salmonid migration or spawning habitat. Overuse of these shallow resources could put threatened salmon in jeopardy.

- Identify trends in water quantity and water quality. As development has occurred in the GWMA, runoff has been diverted to surface water and could be reducing groundwater recharge. In addition, groundwater withdrawals have been increasing for this same development. Together, these factors could be reducing groundwater quantity. Groundwater quality is also threatened by many land uses in the area.
- Identify groundwater sensitive areas. Inappropriate land uses could contaminate the recharge areas of the GWMA's significant shallow groundwater resources. Both the City of Redmond and King County have recently proposed aquifer protection ordinances, but both ordinances require mapping of surficial geology to determine priority areas of high susceptibility.
- Collect, manage, and distribute groundwater data relevant to the GWMA. To be useful, groundwater data that is obtained by any agency should be combined with all other data. This can be accomplished through a central "clearinghouse," but the public, particularly the consulting community, can also combine the data.

EXISTING SOURCES OF GROUNDWATER DATA

There are a number of existing sources of groundwater data for the GWMA, including the following:

- The Area Characterization work for the Redmond-Bear Creek Valley Groundwater Management Plan provides the overall basis of the hydrogeology of the GWMA, although the data for variable conditions (water levels and water quality) are not current.
- Ambient groundwater monitoring by DNRP has updated the water quality and water level data for many of the wells covered by the management plan, but there are many other wells that could not be included in this update.
- DNRP has been conducting a study of groundwater in the Sammamish River Valley under Wastewater Treatment Division funding. This ongoing study includes installing monitoring wells, pumping tests, and modeling.
- A limited number of hydrogeologic studies have been conducted in the GWMA, mainly for purveyors. Several studies, which included groundwater flow modeling, were conducted for the City of Redmond. The Union Hill Water Association developed hydrogeologic wellhead protection plans. The wellhead protection areas for the Northeast Sammamish Sewer and Water District appear to be based on the Calculated Fixed Radius method however, new hydrogeologic-based data may soon be available. A temperature-based study of surface water/groundwater interactions has been conducted for the Union Hill Water Association, and the Northeast Sammamish Sewer and Water District, but the report is not available at the time of this plan.
- The Redmond Ridge development has a number of monitoring wells to assure that groundwater impacts are minimized. They have also researched the hydrostratigraphy in some detail.
- The Washington State Department of Ecology has made its well log data available via the Internet.
- USGS and King County DNRP, have maintained stream gages and obtained data over an extended period of time that can provide baseline data for flows in the Sammamish River, Lake Sammamish, Bear Creek, Evans Creek, and many of their tributaries.
- USGS has performed studies in many areas around the US, to develop method for estimating surface water – groundwater interactions.
- Seattle District, Corps of Engineers, has responsibility for the Sammamish River, and to assure that it can carry flood flows. As such, they have models to predict flows and water levels in the river. The Corps was also involved in development of the Sammamish River Corridor Action Plan. USGS stream gage data.

These data are not comprehensive or completely up to date. In order to address the priorities listed above and meet the stated objectives, it will be necessary to collect new data as well as to compile the existing data sets.

PROPOSED SERVICES

To address the priorities discussed by the Redmond-Bear Creek Groundwater Protection Committee, King County proposes that the committee invest in a three-year program to obtain additional hydrogeologic data for the GWMA ("Study Area"). In general, the work will not focus on making management recommendations, and the efforts involved with the water resources evaluation will not duplicate existing work, particularly in the Evans Creek area. This program would consist of the following work items, broken out by year:

- 2005 – Review previous surface water/groundwater interaction studies, develop a work plan, and initiate studies; continue stream flow and precipitation gaging; initiate database and Web page development; begin geologic mapping.
- 2006 – Continue the surface water/groundwater interaction study; continue stream flow and precipitation gaging; maintain the database and Web pages; continue geologic and susceptibility mapping.
- 2007 – Complete geologic and susceptibility mapping; continue stream flow and precipitation gaging; maintain the database and Web pages; complete surface water/groundwater interaction study.

This water resources evaluation would provide data that can be used to inform decision-makers about the impact of land-use changes, water withdrawals, and climate change on groundwater supplies within the study area. This data set could be used to help develop a long-term monitoring strategy for groundwater in the area and identify future needs, if any, for more possible groundwater modeling.

SURFACE WATER/GROUNDWATER INTERACTION STUDY

DNRP is proposing a pilot project to help quantify groundwater movement near streams. This proposal is based on a number of studies, in the Study Area and elsewhere, including the following:

- temperature-based studies by the USGS across the country
- the results of several studies under the Sammamish River Valley Groundwater Study, including “mini-piezometer” work by Ecology, and clusters of monitoring wells with water level and temperature logging.

The proposed study would be used initially to assess the Cold Creek Aquifer area and some nearby basins such as Cottage Lake Creek and Daniels Creek. Some details for this proposed study will be developed when the final reports for the previously mentioned studies are complete.

The five main tasks required to complete the interaction study are described below.

Task 1: Review Previous Studies

Review previous studies.

Task 2: Develop Work Plan

Develop a work plan and present it to the Redmond-Bear Creek Groundwater Protection Committee.

Task 3: Develop Monitoring Methods

Install temperature probes and mini-piezometers, and utilize other monitoring methods.

Task 4: Make Observations

Observe water levels and temperature fluctuations.

Task 5: Make Calculations

Calculate interaction factors between surface water and groundwater.

STREAM FLOW AND PRECIPITATION GAGING

As of 2004, DNRP monitors six sites for stream flow within the Bear Creek Valley (three on Big Bear Creek, one on Evans Creek, one on Cottage Lake, and one on Cold Creek). King County also has a full-service weather station and two additional precipitation gages within this area. These current levels of surface water monitoring are based on Surface Water Management (SWM) funding, with some telemeter costs being supported by the Northeast Sammamish Sewer and Water District. This body of work also includes a basin-wide assessment of all measurable streams over a short time period (two to three days). Finally, new gages may be installed if the proposed level of funding is made available.

The three main tasks required to complete the gaging are described below.

Task 1: Continue Monitoring

Continue stream flow and precipitation monitoring.

Task 2: Install Gages

Install new gages as possible.

Task 3: Provide Data

Provide data via DNRP hydrology Web pages.

GEOLOGIC AND SUSCEPTIBILITY MAPPING

DNRP is proposing to contract with the University of Washington's GeoMapNW (formerly the Seattle-Area Geologic Mapping Project) to perform geologic mapping of an area both within and adjacent to the GWMA. Benefits of this mapping effort would include defining groundwater recharge areas with new susceptibility and maps.

The five main tasks required to complete the mapping are described below.

Task 1: Define Study Area

Only a portion of the Redmond-Bear Creek Valley Groundwater Management Area and adjacent areas will be mapped. A current priority area is the Cottage Lake and Cold Creek area. Some aspects of this mapping have already been accomplished in the Sammamish River Valley, the Woodinville and the North Redmond areas. We propose to complete these areas (mainly the surficial geologic mapping and input of hydrologic parameters) and to extend the study to the Bear Creek basin. The selection of actual mapping areas will be approved by the PMT.

Task 2: Collect Subsurface Geologic Data

Collect subsurface geologic data (such as borehole or well logs) for the mapping area from sources at King County, with cities and purveyors, in state agency offices in Olympia, and elsewhere.

Task 3: Provide Database

Provide a database that includes both groundwater information and a list of boring logs in the mapping area.

Task 4: Perform Geologic Field Mapping and Updates

Perform geologic field mapping in the mapping area to aid in the development and verification of geologic units for interpretation of maps and cross-sections; use these data to update previous geologic mapping (to a 1:24,000 scale) and create geologic cross-sections of the mapping area.

Task 5: Map Susceptibility

Provide a map that indicates a high, medium, or low susceptibility to groundwater contamination for each reinterpreted geologic unit in the study area to allow for future revision of central aquifer recharge areas (CARA) as needed.

REDMOND-BEAR CREEK VALLEY GROUNDWATER DATABASE/WEB PAGE

DNRP currently has software (EQuIS) that allows compilation of groundwater data. DNRP staff is trying to obtain the most up-to-date groundwater data from a variety of sources within the Redmond-Bear Creek Valley Groundwater Management Area as well as the rest of King County. With the completion of this project, the groundwater data will be available to the public via interactive Web pages.

The three main tasks required to complete the groundwater database/Web pages are described below.

Task 1: Compile Existing Data

Compile available GWMA-specific groundwater data.

Task 2: Program Web Page

Program the Web pages to allow interactive data downloading.

Task 3: Update Information

Update the information on an annual basis.

WATER RESOURCES EVALUATION DELIVERABLES

Table 1. Proposed Water Resources Evaluation Deliverables by Year

Year	Deliverables
2005	<ul style="list-style-type: none"> • Work plan for surface water/groundwater interaction study; initiate hydrogeologic mapping; mid-project progress report • Provide stream flow and precipitation gaging data via DNRP hydrology Web pages. • GWMA-specific groundwater database programmed; Web pages available to the public.
2006	<ul style="list-style-type: none"> • Surface water/groundwater interaction study continues; continue hydrogeologic mapping. • Provide stream flow and precipitation gaging data via DNRP hydrology Web pages • GWMA-specific groundwater database/Web pages maintained
2007	<ul style="list-style-type: none"> • Complete geologic and susceptibility mapping, produce new map • Provide stream flow and precipitation gaging data via DNRP hydrology Web pages • GWMA-specific groundwater database/Web pages maintained

WATER RESOURCES EVALUATION ESTIMATED COSTS

The total estimated cost for the water resources evaluation is \$452,400 over three years. Of this total, DNRP will contribute \$210,000 from the SWM fund to continue and extend stream and precipitation gaging. Thus, new (non-SWM) costs for this effort will be \$242,400.

Table 2. Water Resources Evaluation Estimated Costs by Work Item

Work Item	Year	Labor (FTE)	Material Labor or Consultant Costs	Total Cost
Surface Water/Groundwater Interaction Study	2005-2007	0.79	\$33,077	\$141,600
Stream Flow and Precipitation Gaging	2005-2007	1.50 SWM fund	-----	\$210,000
Geologic and Susceptibility Mapping	2005-2007	0.10	\$75,000	\$89,000
GWMA-specific Groundwater Database/Web Pages	2005-2007	0.11	-----,	\$15,400
TOTAL		2.50	\$108,077	\$456,000

*Labor costs vary, but are based on \$140,000 per FTE per year.

Table 3. Water Resources Evaluation Estimated Costs by Year

Year	Work Item/Task	Labor (FTE)	Material Lab. or Consultant Costs	Total Costs
2005	Stream Flow & Precipitation Gaging	0.5		\$ 70,000
2005	SW/GW Interaction Study	0.12	\$ 23,277	\$ 39,000
2005	UW Mapping	0	\$ 36,000	\$ 36,000
2005	GWMA - specific groundwater database & web services	0.05		\$ 7,000
	2005 Total	0.67		\$ 152,000
2006	Stream Flow & Precipitation Gaging	0.5		\$ 70,000
2006	SW/GW Interaction Study	0.47		\$ 64,800
2006	UW Mapping	0	\$ 13,000	\$ 13,000
2006	GWMA - specific groundwater database & web services	0.03		\$ 4,200
	2006 Total	1		\$ 152,000
2007	Stream Flow & Precipitation Gaging	0.5		\$ 70,000
2007	SW/GW Interaction Study	0.2	\$ 9,800	\$ 37,800
2007	UW Mapping	0.1	\$ 26,000	\$ 40,000
2007	GWMA - specific groundwater database & web services	0.03		\$ 4,200
	2007 Total	0.83		\$ 152,000
	TOTAL	2.5		\$ 456,000

* Labor costs are based on \$140,000 per FTE per year; labor costs may vary.

Total RBC Groundwater Program 3-year financial overview

Detail for RBC Groundwater ILA Services

Budget

	Year	2005	2006	2007	Average Annual FTE	Comments
Science						
	Stream flow and precipitation gaging	\$ 70,000	\$ 70,000	\$ 70,000	0.50	
	SW/GW Interaction	\$ 39,000	\$ 64,800	\$ 37,800	0.12	(.47 in '06/.20 in '07)
	UW Mapping	\$ 36,000	\$ 13,000	\$ 40,000	0.10	(in '07 plus UW Staff)
	GW data base & web service	\$ 7,000	\$ 4,200	\$ 4,200	0.05	(.03 in '06/'07)
	Science subtotal	\$ 152,000	\$ 152,000	\$ 152,000	0.77	
Education						
	Education web site coordination of materials	\$ 3,282	\$ 3,282	\$ 3,282	0.02	
	Annual Educators GW Forum	\$ 16,565	\$ 16,565	\$ 16,565	0.10	
	4 GW Articles	\$ 8,282	\$ 8,282	\$ 8,282	0.05	
	Education subtotal	\$ 28,129	\$ 28,129	\$ 28,129	0.17	
GWPC						
	GWPC logistics; notes, schedules, agendas	\$ 18,361	\$ 18,361	\$ 18,361	0.06	
	GW Policy and Subcommittee work	\$ 7,787	\$ 7,787	\$ 7,787	0.05	
	GWPC subtotal	\$ 26,148	\$ 26,148	\$ 26,148	0.11	
RBC Program						
		\$ 206,277	\$206,277	\$206,277	1.05	

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Exhibit One

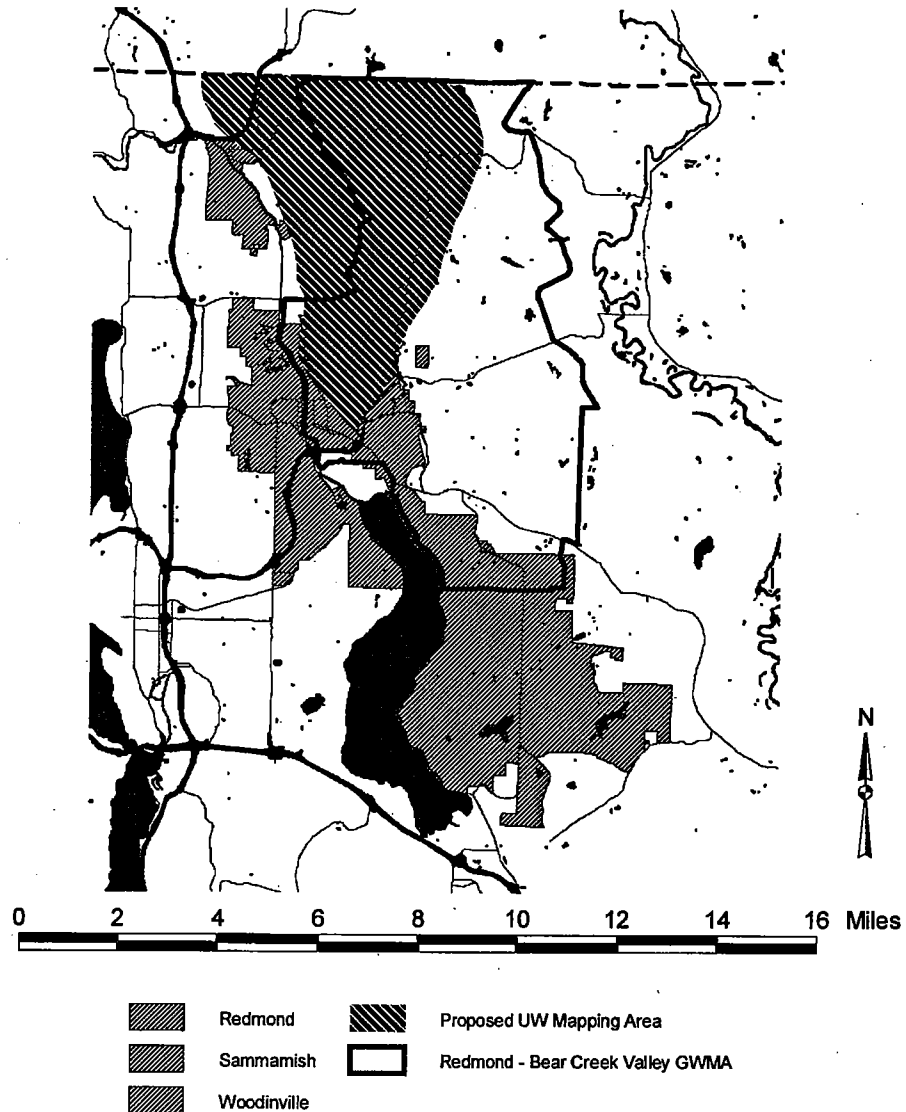
Project Cost Shares

	2005 Cost Share %	2005 Estimated Cost (\$)	2006 Cost Share %	2006 Estimated Cost (\$)	2007 Cost Share %	2007 Estimated Cost (\$)	TOTAL ESTIMATED COST (\$)
King County	58.17%	\$120,000	58.17%	\$120,000	58.17%	\$120,000	\$360,000
City of Redmond	19.39%	\$40,000	19.39%	\$40,000	19.39%	\$40,000	\$120,000
City of Woodinville	7.27%	\$15,000	7.27%	\$15,000	7.27%	\$15,000	\$45,000
Additional Revenues *	15.16%	\$31,277	15.16%	\$31,277	15.16%	\$31,277	\$93,831
Grand Total		\$206,277		\$206,277		\$206,277	\$618,831

* Additional Revenues will be pursued on an annual basis with King County acting as fiscal agent.

Redmond - Bear Creek Valley Groundwater Management Area

Proposed UW Mapping Areas



Note: Final mapping area will be determined by the Project Management Team (PMT)
March 21, 2005