

Memo



Date: February 9, 2010
File: 0482-20
To: City Manager
From: Director, Regional Services
Subject: Regional Aggregate Supply and Demand Forecasts

Recommendation:

THAT Council approve participation in an Aggregate Supply and Demand Update for the Regional District of Central Okanagan.;

AND THAT the 2010 Financial Plan be amended to provide funding of \$42,000 as the City's share of the project from the Public Private Partnership Reserve.

Background:

A Task Force has recently been formed to develop a long range management plan for aggregate/gravel extraction operations in the Central Okanagan. This is in response to public interest in gravel pit operations, administrative challenges, the long-term need for aggregate supply and the sensitive nature of new gravel pit approvals. The Task Force formed in December, 2009 and is co-chaired by Norm Letnick, MLA, Kelowna-Lake Country and Robert Hobson, Chair, Regional District of Central Okanagan.

The Task Force is still in its early stage and has been developing its work plan and communications program. Their work is expected to be ongoing through 2010 and completed in 2011.

A Technical Committee has been created to support the Task Force with staff representation from all of the local governments of the Central Okanagan. This Technical Committee has been tasked with updating the forecasts for the supply and demand for aggregate in the Central Okanagan over the next 100 years. This work is planned to be done by a specialized consultant using growth forecasts from each of the local jurisdictions to forecast demand for aggregates. Existing gravel pit information, along with mapping and other information sources will be used to forecast the available aggregate supply. A Terms of Reference for this work has been prepared and is attached to this report. The estimated cost of this work is between \$50,000 and \$60,000. It is proposed that the work be paid by the local governments through a standard cost apportionment approach.

Subject to Council's approval and the approval of the other local governments, a request for proposals will be issued by the Regional District. Assuming commencement of the work in March/2010 it is expected that the work would be completed by year end.

It is not yet known what, if any, additional funding will be required of local government for the Pilot Project. The scope of this work has not been confirmed. External funding will be sought for this work if required.

The staff time from each of the local governments is attendance at the Technical Committee meetings which may average about one per month over this year. In addition, staff may be required to attend the Task Force's meeting which could also be about one per month.

Internal Circulation:

Director, Financial Services

A handwritten signature in black ink, appearing to be "J. P." or similar, located at the bottom right of the page.

Director, Community & Media Relations (for information)

Financial/Budgetary Considerations:

It is proposed that funding for this work come from the Private Public Partnership Reserve.

Communications Considerations:

The communications support for the Task Force is being provided by the Regional District.

Considerations not applicable to this report:

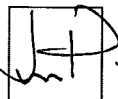
- Legal/Statutory Authority
- Legal/statutory Procedural Requirements
- Existing Policy
- Personnel Implications
- Technical Requirements
- External Agency/Public Comments
- Alternate Recommendation

Submitted by:



R. Westlake, Director, Regional Services

Approved for inclusion:



Jim Paterson, General Manager, Community Sustainability

CC: Director, Financial Services

Attach. Terms of Reference for Aggregate Supply and Demand Update

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CREATING AND DELIVERING BETTER SOLUTIONS

www.eba.ca

February 9, 2010

EBA File: K23101536

Department of Development Services
Regional District of the Central Okanagan
1450 KLO Road
Kelowna, BC V1W 3Z4

Attention: Mr. Dan Plamondon
Director of Development Services

Via e-mail: dan.plamondon@cord.bc.ca

Dear Mr. Plamondon:

**Subject: Terms of Reference for an Aggregate Supply and Demand Update
for the Regional District of the Central Okanagan**

1.0 INTRODUCTION

In recent years, there has been interest on the part of local governments and interest groups to undertake an aggregate planning project in order to reduce land use conflicts and prepare a regional aggregate strategy. To this end, the Honourable Randy Hawes, Minister of State for Mining, has requested Norm Letnick, MLA of Kelowna / Lake Country, to lead a **Task Committee** comprised of members from the aggregate industry, local associations, member municipalities, and WFN or the Okanagan Nation Alliance. MLA Letnick has invited Robert Hobson, RDCO Chair to join him as co-chair for the Committee. A **Technical Committee** has been established with representatives from each member municipality and Interior Health and WFN. The Technical Committee provides technical support and direction to the Task Committee.

The Task Committee's objective is to develop a comprehensive management strategy for the RDCO that will:

- make efficient use of the aggregate resource;
- minimize land use conflicts; and
- avoid the sterilization of the resource due to urbanization through the establishment of land use designations.

As a first step in this process, the Committee has decided that a Central Okanagan Aggregate Supply and Demand Update Study is required. The Committee is looking for a qualified consulting firm to update the status of supply and demand of aggregate in the Regional District of the Central Okanagan. The study will build on the supply and demand data contained in the *Central Okanagan Growth Management Strategy – Aggregate Supply and*

Terms of Reference Letter Report.doc

EBA Engineering Consultants Ltd.
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150, 1715 Dickson Avenue • Kelowna, British Columbia V1Y 9G6 • CANADA



Demand Study (EBA, 2000), and project forward supply and demand over the next 100 years. The Update will provide base data for the Central Okanagan Aggregate Pilot Project. However, this Request for Proposal (RFP) addresses the Supply and Demand Update only. The Pilot Project will be initiated later in the process.

This document includes the Terms of Reference (TOR) for the Central Okanagan Aggregate Supply and Demand Update Study.

2.0 BACKGROUND

In 2000, the Central Okanagan Growth Management Strategy - Aggregate Supply and Demand Study (EBA, 2000) provided an inventory and assessment of aggregate supply and demand with projections over 20 years. Now, 10 years later, the estimated supply volumes and demand require an update. The Task Committee has specified that the update look at supply and demand for the next 100 years.

The Supply and Demand Study (EBA, 2000) provided aggregate potential maps with polygons of high, moderate and low aggregate potential based on terrain mapping with provincially recognized methodology. The mapping used Geological Survey Branch of the Ministry of Energy and Mines aggregate potential mapping (P. Bobrowsky 1998, 1:50,000) as a base, and refined the high polygons using air photo interpretation. Since this mapping, there has been more terrain mapping completed in the district. The Sensitive Ecosystem Inventory mapping, (various projects, 1:10,000 scale) has a bioterrain component, and some of the upper elevations of the district have been mapped for Terrain Stability Mapping (1:20,000 scale). Some field checking was completed for the SEI mapping, and is also typically done for Terrain Stability Mapping.

The 2000 Study mapped potential sources of crushed stone from bedrock (Appendix A). Bedrock was mapped in terms of its potential for aggregate and other products such as dimensional stone and landscape rock. Bedrock groups were mapped using existing geological mapping (W.M. Mathews, 1987; B.N. Church, 1981; Jones, 1959; Templeton Klyit, 1989). Since 2000, the Lake Country area (Mapsheet 82L) has been mapped for bedrock at 1:50,000 scale.

A reference for SEI mapping in the area is available at http://a100.gov.bc.ca/appsdata/acat/documents/r15326/sci_ok_valley_2000_2007_final_1224694292657_8c248a8d30d931f7d0dfac76458d9f18d94704392c82.pdf. Also refer to Appendix C.

For terrain stability mapping coverage, refer to:

http://www.env.gov.bc.ca/terrain/terrain_files/info_sources.html%23southern.

The 2000 Study also surveyed local producers, who provided data on estimated volumes and annual production of their pits. Demand was estimated using standard rates of

aggregate consumption for North America in locations of expanding infrastructure, and, as well, used growth rates and anticipated residential, commercial and industrial expansion targets from local government's Official Community Plans (OCPs).

The 2000 Study produced a template for a Soil Removal and Deposit Bylaw (SRDB), to be implemented by each local government individually. To date, the District of Lake Country, City of Kelowna, as well as the District of Peachland have adopted SRDBs. The RDCO has chosen not to pursue a SRDB, largely because, while municipalities are able to charge volume based fees for soil removal and deposit, regional districts are not.

Considerations with respect to aggregate extraction include:

1. Mining permits are an approval of a works system for mining and reclamation of the land surface in accordance with Section 10 of the Mines Act. Permits outline both general and specific conditions required to operate their works, protect and reclaim land surfaces and water courses. Reclamation of depleted sections prior to starting new mining activity on neighbouring sections (progressive reclamation) can be a condition of a mining permit.
2. Royalties are collected by Integrated Land Management Bureau (ILMB) for pits and quarries on crown land.
3. Industrial production pits are not differentiated in the Mines Act from smaller excavations to enhance a property.
4. First Nations can apply for a Mines Act Permit.
5. Aggregate extraction and processing with mobile equipment (e.g. crushers and screeners) are not considered land use and, as such, cannot be regulated through zoning. Permanent structures, such as asphalt and concrete plants, are considered a land use and are subject to zoning.

3.0 OBJECTIVE

The objective of this study is to update the supply and demand data from 2000 (EBA, 2000) and make projections for the region for the next 100 years. Projections for supply and demand should be made for 20, 50 and 100 time windows. The projections for 20 years should be more detailed, based on supply permit information and OCP forecasts. The projections for 50 and 100 years will be necessarily less detailed. The Consultant's methodology for supply and demand forecasts should be outlined in the proposal.

The intent is to update supply data and demand projections using current information and updated terrain data available. The Technical Committee will establish a consistent methodology for determining growth within their jurisdictions and provide growth data to the consultant team.

4.0 TASKS AND SCHEDULE

This section outlines anticipated tasks involved and schedule.

TABLE 1: TASKS, DELIVERABLES AND SCHEDULE	
Tasks and Deliverables	Schedule
1. Start-up. Deliverable: Start-up meeting	March 2010
2. Supply Data Review - Compile MEMPR data, mine estimated supply, amount extracted to date, amount remaining, rate of extraction, years est. remaining, and years left on permit, as well as MOTI pit data. The study shall include supply data for aggregate, as well as for quarried rock, for use as dimensional stone, landscaping material, and / or rock crush. Deliverable: Summary compilation of MEMPR and MOTI supply data.	April, 2010
3. Producers Survey – Undertake a producer's survey to determine estimated reserve volumes of aggregate and rock, and annual extraction. Confidentiality of information on a pit by pit basis must be ensured. An example of the 2000 survey is included in Appendix B for reference. Deliverable: Summary of producer survey results.	April, 2010
4. Aggregate and Potential Sources of Crushed Stone Update. Prepare an updated aggregate potential map. Update the EBA 2000 maps (Appendix A) using the terrain polygon data from the recent work done in the SEI mapping (terrain layer) and Terrain Stability Mapping available within the district. The EBA 2000 maps are in CAD format and will need to be translated into GIS format. The consultant will need to provide a methodology satisfactory to the Technical Committee that describes the terrain criteria for each of the high, moderate, and low aggregate potential areas taken from the SEI and Terrain Stability mapping. The consultant will need to provide maps of current ALR Boundaries and urban development. Base mapping will be provided by the RDCO and member municipalities for the ALR and urban areas. Update the Potential Sources of Crushed Stone Map (Appendix A) for map sheet area 82L (Lake Country), to incorporate recent bedrock geology mapping available at 1:50,000 scale. Prepare a methodology to determine high, moderate, and low sources of rock crush that will be reviewed by the Technical Committee. Bedrock types that are suitable for dimensional and landscape rock should be identified. Note that while First Nations lands were mapped by the SEI on the east side of Okanagan Lake, it is not available for First Nations lands on the west side of Okanagan Lake. Deliverables: Methodology for aggregate potential / rock crush and quarried rock potential Updated Aggregate Potential Map Updated Agricultural Land Reserve / Urban Areas Map (RDCO and member municipalities to provide base) Updated Aggregate Potential Maps net of ALR and Urban Areas Map Updated Potential Sources of Crushed Stone Map.	April (Methodology only) June (Maps)

TABLE 1: TASKS, DELIVERABLES AND SCHEDULE	
Tasks and Deliverables	Schedule
5. Supply Data Summary - Provide a summary of supply data for each local government jurisdiction within the District. Deliverable: Supply Data Summary	June, 2010
6. Demand Data Review - Compile OCP demand data from each member local government's projection of future growth of single family, multi-family, commercial and industrial projections and major transportation projects (to 20 years). Make projections on future growth based on per capita consumption within areas of expanding infrastructure and growth projections to 100 years. Include future needs and demand node priorities. Deliverable: Demand Data Review and Projections to 20, 50 and 100 years	June 2010
7. Demand Data Summary - Provide a summary of demand data for each local government within the District. Deliverable: Demand Data Review	June 2010
8. Interim presentation and report, Issued for Review, to Technical Committee (70% completion) Deliverable: Issued for Review Report and Presentation	June 2010
9. Referral to stakeholders and ministries (e.g. APABC, UDI, WFN, ministries through ILMB such as MEMPR, MOTI, MOE, etc.)	July 2010
10. Interim presentation to Task Committee (70% completion) Deliverable: Presentation to Task Committee	September 2010
11. Revisions based on input from referrals and Task Committee Deliverable: Revised report	October 2010
12. Presentation to Technical Committee (95% completion) Deliverable: Presentation to Technical Committee	November 2010
13. Presentation to Task Committee (95% completion) Deliverable: Presentation to Task Committee	November 2010
14. Final Submission Report and Maps, Issued for Use (100% completion) Deliverable: Issued for Use Report and Maps	December 2010

Notes:

1. The MEMPR has supply data available from pit permits, and will provide a map of permitted gravel pits and quarries within the RDCO. They will also supply a contact list of producers in the district (R. Bronstein, pers. Comm., Feb. 2, 2010).
2. Volume based royalties are collected annually for gravel and rock extraction on crown land by the Integrated Land Management Bureau (ILMB) (R. Bronstein, pers. Comm., Feb. 2, 2010).
3. The project includes all lands within the Central Okanagan Regional District, including all federal, provincial, and private lands within municipalities and un-incorporated areas.
4. Growth projection data will be provided by member municipalities and associated organizations (e.g. Economic Development Commission, DCC Bylaw data, OCP's, Land Use Analysis, and WFN OCP information).

5.0 DELIVERABLES

Upon completion of the project, the Consultant will provide one original, unbound document in an 8.5" x 11" format (maps may be 11" x 17"), suitable for reproduction. The Consultant will submit 6 hard copies of the document, including photographs and maps. The complete report and maps should be submitted in digital form in PDF format, as well as a GIS compatible format (e.g. .shp files), NAD 83 Zone 11, without slivers.

6.0 PROJECT TEAM COMMITMENT

The Client's Technical Committee will provide to the Consultant all available base mapping (e.g. subdivision/urban areas, ALR boundaries, MEMPR location of pits, TRIM data, EBA 2000 maps in CAD format) as well as pertinent past reports, OCPs, and studies at its disposal. Digital contour data is available for most of the District through the RDCO.

The Technical Committee will establish a consistent methodology for determining growth within their jurisdictions and provide growth data to the consultant team.

7.0 CONSULTANTS REQUIREMENTS AND PROPOSAL

The proponents must attend a mandatory proponents briefing.

The Consultant is requested to submit **six (6)** copies of the proposal which includes the following:

- Full name, address, telephone number, and e-mail address of the submitting office of the Consultant and where applicable, the name, address and telephone number and e-mail address of any branch office, affiliate, or sub-consultant(s) that will be involved in the project.
- A statement of corporate experience, including affiliates or sub-consultant(s). Identify experience of similar projects including references.
- Identify the proposed Project Manager who will be the prime point of contact, responsible for direct interaction with the Client. A listing of additional key personnel assigned to the project along with their professional qualifications and pertinent experience should also be included.
- The proposal must contain the following statement: *"Key individuals listed in this proposal shall only be replaced with written approval from the Client"*.
- A statement indicating that the consultant team has adequate staff time and resources available to fulfill the project requirements on schedule.
- A description of proposed methodology.

- A detailed project timeline, identifying specific milestone dates. Milestone dates will include, but not be limited to, the dates outlined in this RFP. They schedule will include any meetings and identify the hours, staff and fees associated with each stage.
- A project Fixed Fee, allocated against the specific tasks as identified in Section 4.0 Tasks and Schedule. The price is to be in table format, listing the tasks and assigned personnel, identified person-hours, hourly rates and estimated disbursements. Fees are to be in net Canadian funds with GST and PST taxes indicated separately.
- The Consultant must include the following endorsement in their proposal: *"We (name of Consultant) do hereby confirm that all computer software used by the Consultant in the execution of this assignment is directly licensed to the Consultant"*.
- Any additional information which the Consultant believes may enhance the submission should be included as an Appendix to the submission.

Scaled proposals, identified on the outside of the envelope with the words "AGGREGATE SUPPLY AND DEMAND UPDATE" will be received by the Regional District of the Central Okanagan Planning and Development Services Department, 1450 KLO Road, Kelowna BC, V1W 3Z4 no later than _____.

8.0 SELECTION CRITERIA

The submissions will be reviewed and evaluated by the Task Committee, based on the following criteria: study process and methodology, qualifications of consulting personnel, completeness, and clarity of the submission, pertinent experience, and schedule for completion of the project, proposed fees, and technical/computer compatibility.

9.0 STANDARD REQUIREMENTS

(Include standard contract requirements).

10.0 RESOURCES

The following is a list of resources:

EBA Engineering. 2000. Central Okanagan Growth Management Strategy Aggregate Supply and Demand Study – RDCO, District of Lake Country, District of Peachland and the City of Kelowna. Kelowna, BC.

Fraser Valley Regional District (FVRD), 2009. Fraser Valley Regional District Aggregate Pilot Project.

Ministry of Energy, Mines and Petroleum Resources Mining and Minerals Division. 2008.

Health, Safety and Reclamation Code for Mines in British Columbia, Victoria, BC.
<http://www.empr.gov.bc.ca/Mining/HealthandSafety/Pages/HSRC.aspx>

Province of British Columbia. 2002. Aggregate Operators BMP Handbook for British Columbia. <http://www.empr.gov.bc.ca/Mining/Aggregate/BMP/Pages/default.aspx>

Province of British Columbia. [RSBC 1996] Chapter 293. 1996. BC Mines Act.

http://www.bclaws.ca/Recon/document/freeside/--%20M%20--/Mines%20Act%20%20RSBC%201996%20%20c.%20293/00_96293_01.xml

Province of British Columbia. British Columbia Mining Plan. 2005.
http://www.gov.bc.ca/empr/popt/reports/down/bc_mining_plan_02_2007.pdf

A reference for SBI mapping in the area is available at

http://a100.gov.bc.ca/appsdata/acat/documents/r15326/sci_ok_valley_2000_2007_final_1224694292657_8c248a8d30d931f7d0dfac76458d9f18d94704392c82.pdf. Also refer to

Appendix C.

For terrain stability mapping coverage, refer to:

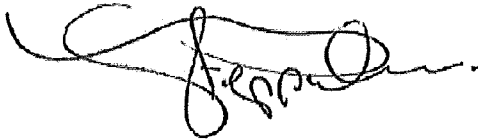
http://www.env.gov.bc.ca/terrain/terrain_files/info_sources.html#23southern.

11.0 CLOSURE

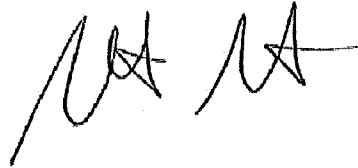
This report and its contents are intended for the sole use of the Regional District of the Central Okanagan (RDCO) and their agents. EBA does not accept any responsibility for the accuracy of any of the data, the analysis or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than the RDCO, or for any Project other than the proposed project. Any such unauthorized use of this report is at the sole risk of the user. Use of this report is subject to the terms and conditions stated in EBA's Services Agreement. EBA's Geo-Environmental Report - General Conditions are attached of this report.

We trust this report meets your present requirements. Should you have any questions or comments, please contact the undersigned at your convenience.

Respectfully submitted,
EBA Engineering Consultants Ltd.



Melanie Steppuhn, B.E.S., B.C.L.A.
Environmental Planner
Environmental Services
msteppuhn@eba.ca



Scott Martin, P. Eng.
Project Director
Geotechnical Services
smartin@eba.ca

/bl

Attachments:	Appendix A	Aggregate Supply and Demand Study Aggregate and Crushed Stone Potential Maps 1 - 4 (EBA, 2000)
	Appendix B	Aggregate Supply and Demand Study - Producer Survey (EBA, 2000)
	Appendix C	SEI Mapping 2008
	Appendix D	Geo-Environmental Report - General Conditions

DEFINITIONS:

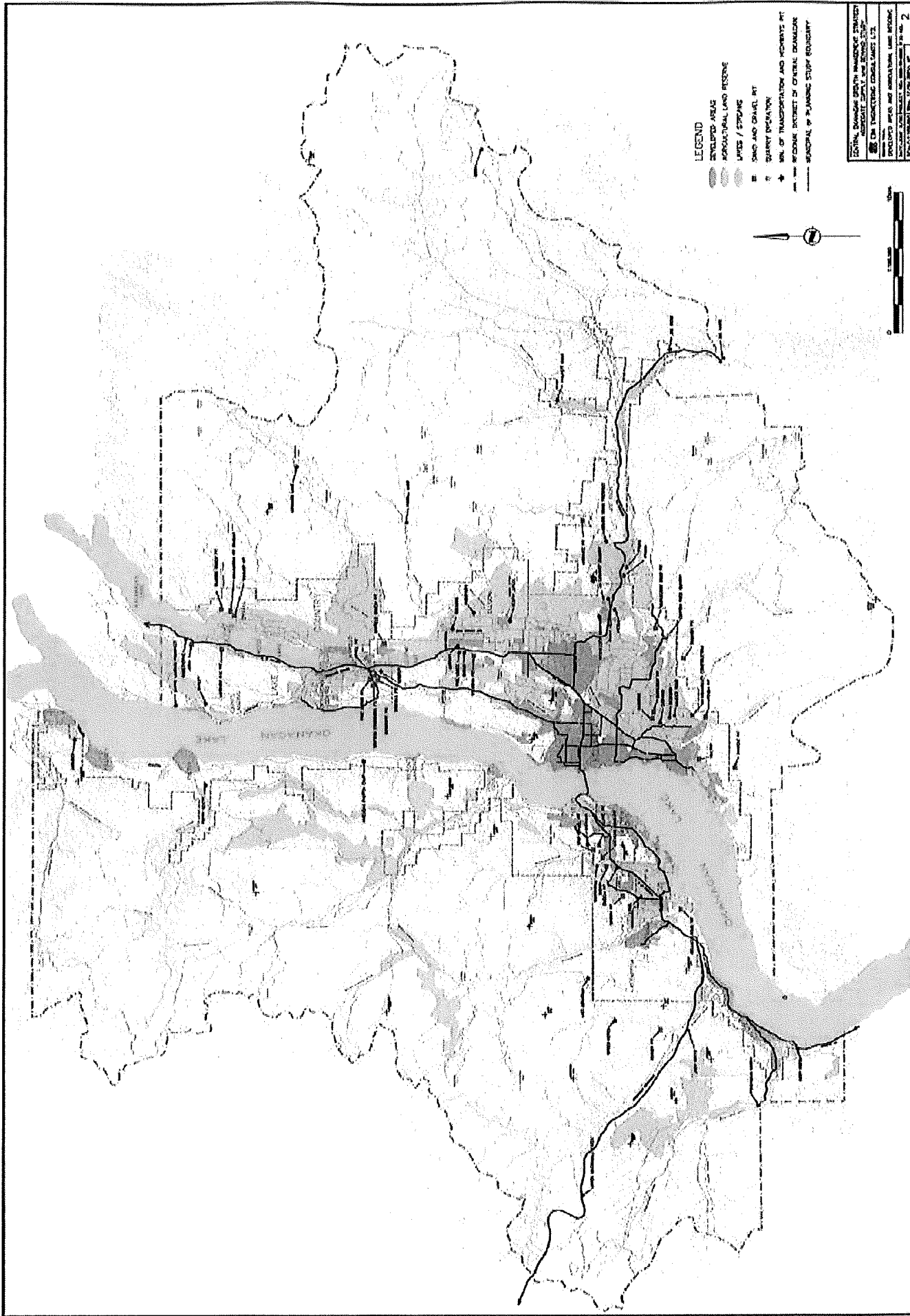
FVRD	Fraser Valley Regional District
ILMB	Integrated Land Management Bureau
MEMPR	Ministry of Energy, Mines and Petroleum Resources
MOTI	Ministry of Transportation and Infrastructure
OCP	Official Community Plan
Pilot Project	The Central Okanagan Aggregate Pilot Project, which is to be modelled after the Fraser Valley Regional District Aggregate Pilot Project, to be initiated further into the process.
Polygon	An area of a map with homogenous characteristics
Task Committee (the Committee)	The Honourable Randy Hawes, Minister of State for Mining, has requested Norm Letnick, MLA of Kelowna / Lake Country, to lead a committee comprised of members from the aggregate industry, local associations, member municipalities, and WFN or the Okanagan Nation Alliance. MLA Letnick has invited Robert Hobson, RDCO Chair to join him as co-chair for the Committee.
Technical Committee	The technical committee is comprised of staff members from each member municipality, RDCO, and Interior Health.
RDCO	Regional District of the Central Okanagan
RFP	Request for Proposal
SRDB	Soil Removal and Deposit Bylaw
TOR	Terms of Reference

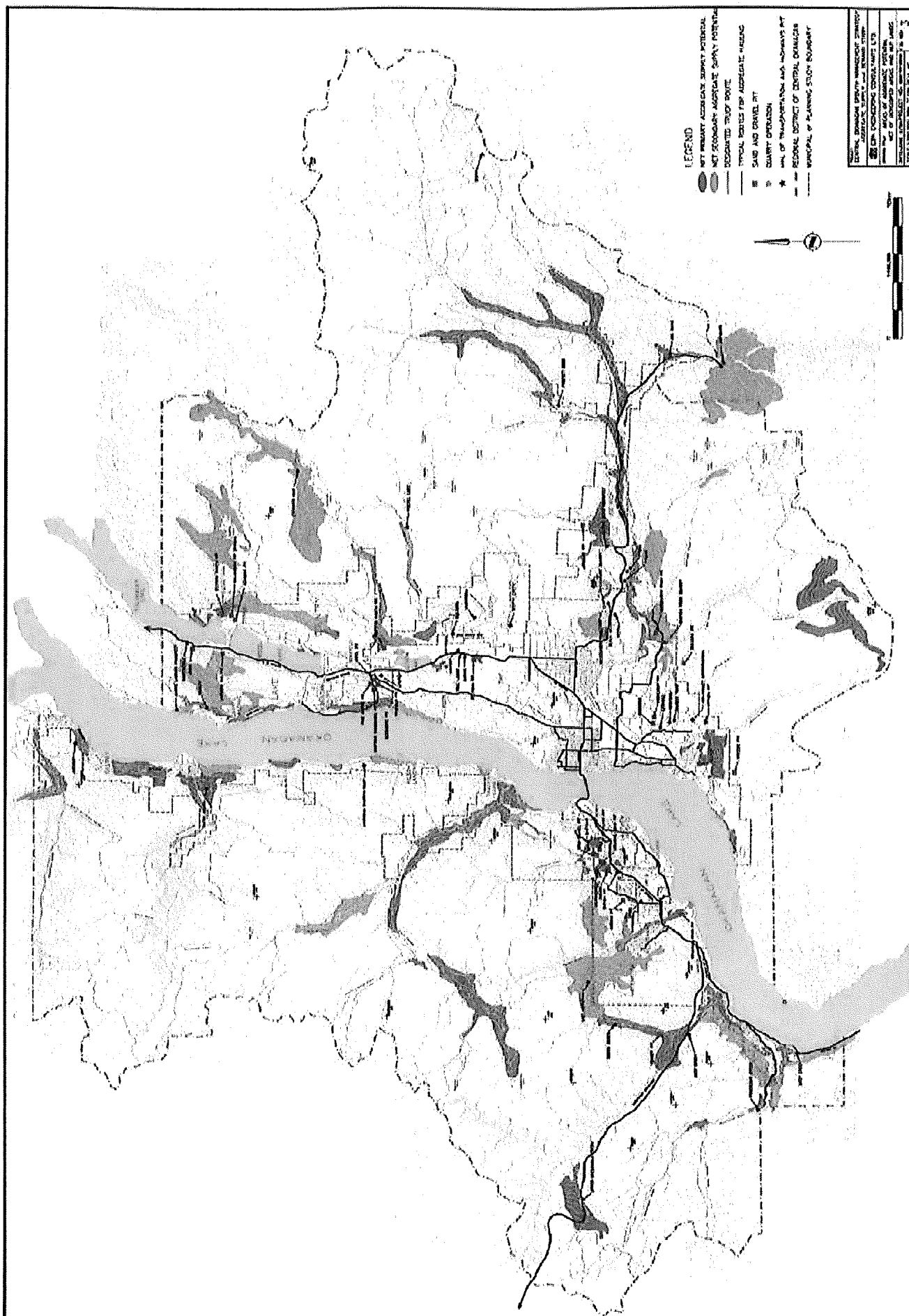
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APPENDIX

APPENDIX A AGGREGATE AND CRUSHED STONE POTENTIAL MAPS 1 - 4 (EBA, 2000)





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APPENDIX

APPENDIX B AGGREGATE SUPPLY AND DEMAND STUDY – PRODUCER SURVEY (EBA, 2000)



DATE:

PRODUCER SURVEY

CONTACT:

COMPANY:

FAX :

PHONE NO:

ADDRESS:

FILE NO: 0808-98-88101 Aggregate Supply and Demand Study

CENTRAL OKANAGAN GROWTH MANAGEMENT STRATEGY

AGGREGATE SUPPLY AND DEMAND STUDY – PRODUCER SURVEY

The Regional District of the Central Okanagan in conjunction with the municipalities of Kelowna, Lake Country and Peachland have initiated an Aggregate Supply and Demand Study. BBA Engineering Consultants Ltd. has been selected as the consultant to prepare the study. The objectives of the study are:

- to identify and determine the capacity of existing aggregate extraction sites and life expectancy of each operation;
- to assess current demand levels and assess projected future demand levels;
- to make recommendations on the aggregate permitting and approval process; as well as
- to assess potential conflicts with neighbouring land uses and the natural environment.

SURVEY CONFIDENTIALITY

We appreciate your help in completing this survey. All information received will be confidential. The information will be used to determine general trends for the industry within the Okanagan, such as: average hauling distance, average volume per year for the District, and so on. Details on individual operations will not be published. We have included space at the end of the survey for your comments and concerns. This information will also be helpful in completing the study. Additional pages may be added if required.

Estimated Aggregate Use

Roads (construction and maintenance)	_____	%	
Concrete production (incl. mortar sand)	_____	%	
Asphalt production	_____	%	
Structural fill	_____	%	
Landscaping	_____	%	
Other uses	_____	%	Please specify _____
Total	100	%	

Volume (Estimated #s for general information)

Total Aggregate Volume

Total average raw aggregate volume per year from pit	_____	cubic m. / m. tonne
Estimated percentage waste (e.g. overburden, silty sand)	_____	%
Estimated percentage marketable aggregate	_____	%
Total	100	%

Marketable Aggregate Volume

Total estimated aggregate volume for 1998	_____	cubic m. / m. tonne
Total aggregate average volume per year for last 5 years	_____	cubic m. / m. tonne
Total aggregate average volume per year for last 10 years	_____	cubic m. / m. tonne

Aggregate Percentage According to Season

January to March	_____	%	April to June	_____	%
July to September	_____	%	September to December	_____	%

Recycled Aggregate Volume

Recycled asphalt	_____	cubic m. / m. tonne
Recycled concrete	_____	cubic m. / m. tonne
Other	_____	Please specify _____

Marketable Aggregate Composition

Sands (less than 4.75mm)	_____	%	Specify _____
Gravels (greater than 4.75mm)	_____	%	
Crushed material	_____	%	
Topsoil	_____	%	
Other	_____	%	
Total	100	%	

Rock Volume

Total raw rock volume per year from quarry	_____	cubic m. / m. tonne
Estimated percentage waste (e.g. overburden, etc.)	_____	%
Estimated percentage marketable rock volume	_____	%
Total	100	%

Rock Volume

Total rock volume production per year	_____	cubic m. / m. tonne
Total rock volume for 1998	_____	cubic m. / m. tonne
Total rock average volume per year for last 5 years	_____	cubic m. / m. tonne
Total rock average volume per year for last 10 years	_____	cubic m. / m. tonne

Rock Volume According to Season

January to March	_____	%	April to June	_____	%
July to September	_____	%	September to December	_____	%

Rock Composition

Decorator Rock (e.g. shale, granite)	_____	%	Please specify _____
Rip Rap	_____	%	
Dimension stone (e.g. gneiss)	_____	%	
Waste (e.g. overburden)	_____	%	
Other	_____	%	
Total	100	%	

Reserve – Aggregate and Rock

Total estimated volume of reserve – aggregate	_____	cubic m. / m. tonne
Total estimated volume of reserve – rock	_____	cubic m. / m. tonne

Estimated life remaining in pit / quarry at present production levels (in # of years) _____

Overburden Depth

Average overburden depth	_____	metres
Range in overburden depth	from _____ to _____	metres

General comments about over burden composition (e.g. topsoil, aggregate fill, etc.)

Ground Water

Average depth to ground water	_____	cubic m. / m. tonne
Range in depth to ground water	from _____ to _____	cubic m. / m. tonne

General comments about depth to ground water:

Transportation

Typical transportation Routes

Average truck size _____ (capacity cubic m. / m. tonne) # axels _____
Average # trucks per day _____
Average # trucks per week _____

Hauling distances

Range of hauling distances from _____ to _____ kilometres
Average hauling distance _____ kilometres
General area of service: _____

Costs (Attach price list - optional)

Trucking Costs

Truck _____ \$ per hour
Truck & Pup _____ \$ per hour

Reclamation Plans

Reclamation plans available? Yes No
Comments on reclamation plans: _____

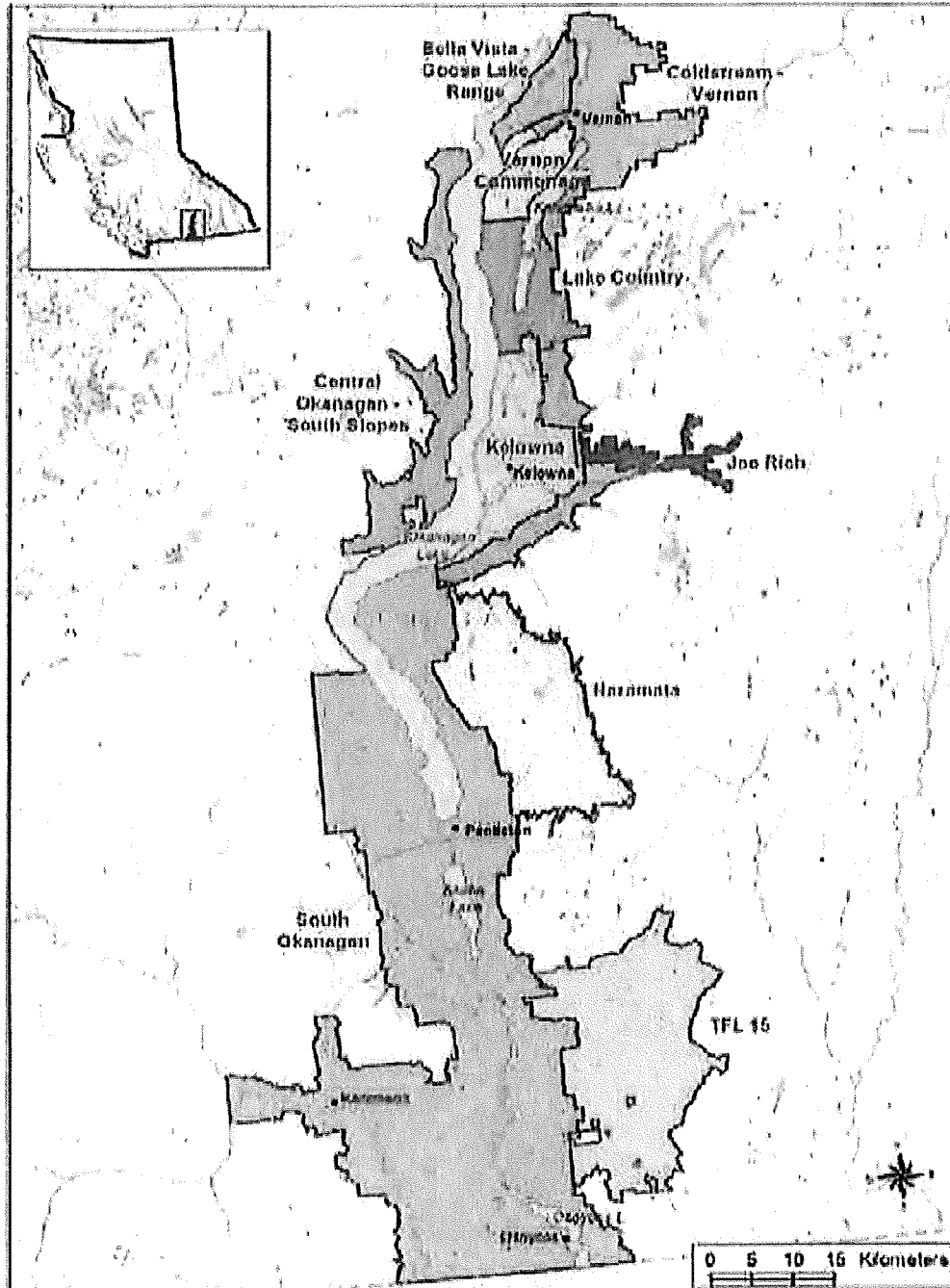
General comments and / or concerns to help us better direct focus of aggregate study (e.g. planning policy, permit process, future land designation, transportation issues, etc.)

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February 2010

APPENDIX

APPENDIX C SEI MAPPING 2008



Iverson, K. et al. 2008. Sensitive Ecosystems Inventory Okanagan Valley: Vernon to Osoyoos 2000 – 2007, Technical Report Series Number 495. Environment Canada
http://a100.gov.bc.ca/appsdata/acat/documents/r15326/sel_ok_valley_2000_2007_final_1224694292657_8c248a8d36d931f7d6dfac76458d9f18d9d4704392c82.pdf

ISSUED FOR USE

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APPENDIX

APPENDIX D GEO-ENVIRONMENTAL REPORT - GENERAL CONDITIONS

GEO-ENVIRONMENTAL REPORT - GENERAL CONDITIONS

This report incorporates and is subject to these "General Conditions".

1.0 USE OF REPORT AND OWNERSHIP

This report pertains to a specific site, a specific development, and a specific scope of work. It is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the site or proposed development would necessitate a supplementary investigation and assessment.

This report and the assessments and recommendations contained in it are intended for the sole use of EBA's client. EBA does not accept any responsibility for the accuracy of any of the data, the analysis or the recommendations contained or referenced in the report when the report is used or relied upon by any party other than EBA's Client unless otherwise authorized in writing by EBA. Any unauthorized use of the report is at the sole risk of the user.

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2.0 ALTERNATE REPORT FORMAT

Where EBA submits both electronic file and hard copy versions of reports, drawings and other project-related documents and deliverables (collectively termed EBA's instruments of professional service), only the signed and/or sealed versions shall be considered final and legally binding. The original signed and/or sealed version archived by EBA shall be deemed to be the original for the Project.

Both electronic file and hard copy versions of EBA's instruments of professional service shall not, under any circumstances, no matter who owns or uses them, be altered by any party except EBA. The Client warrants that EBA's instruments of professional service will be used only and exactly as submitted by EBA.

Electronic files submitted by EBA have been prepared and submitted using specific software and hardware systems. EBA makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.

3.0 NOTIFICATION OF AUTHORITIES

In certain instances, the discovery of hazardous substances or conditions and materials may require that regulatory agencies and other persons be informed and the client agrees that notification to such bodies or persons as required may be done by EBA in its reasonably exercised discretion.