CITY OF KELOWNA

MEMORANDUM

DATE: JANUARY 25, 2007

TO: CITY MANAGER

FROM: PLANNING AND DEVELOPMENT SERVICES DEPARTMENT

APPLICATION NO. DP07-0014
DVP07-0015

OWNER: STRATA K47

AT: 353 BOYCE CRESCENT

APPLICANT: CITY OF KELOWNA

PURPOSE: TO VARY THE RIPARIAM MANAGEMENT AREA SETBACK FROM MILL CREEK FROM 15M REQUIRED TO 11M PROPOSED FOR THE RELOCATION OF A PARKING AREA

TO OBTAIN AN ENVIROMENTAL DEVELOPMENT PERMIT FOR WORK IN AND ADJACENT TO MILL CREEK RELATED TO THE PANDOSY STREET RE-ALIGNMENT PROJECT

EXISTING ZONE: RM5 – MEDIUM DENSITY MULTIPLE HOUSING

REPORT PREPARED BY: RYAN SMITH

1.0 RECOMMENDATION

THAT Council authorize the issuance of Development Permit No. DP07-0014 for LOT CP, K47 located on Boyce Crescent, Kelowna, B.C. subject to the following:

a. Mitigation/Restoration to be provided on the land be in general accordance with Schedule "A";

AND THAT Council authorize the issuance of Development Variance Permit No. DVP07-0015; LOT CP, K47, located on Boyce Crescent, Kelowna, B.C.;

AND THAT variances to the following sections of Zoning Bylaw No. 8000 be granted:

Section 8 – Parking and Loading: 8.1.9(b)

Vary off-street parking location provisions to allow 5 stalls in a required front yard where none are permitted.

Section 8 – Parking and Loading: 8.3.2(b)

Vary the forward entry and exit provisions to allow rear exit movements for 5 parking stalls to allow forward entry and rear exit where it would otherwise not be permitted.

Section 8 – Parking and Loading: 8.3.3:

To vary the requirement that no public street be used for the required aisle access to parking space in order to allow 5 parking spaces to be used as the required aisle access.

AND THAT variances to the following sections of Official Community Plan Bylaw No. 7600 be granted:

Section 7 – Environment: Table 7-1: Riparian Management Area Setbacks

Vary the Mill Creek Setback to the new parking area for properties located downstream of Hardy Road from 15m required to 11.0m.

2.0 SUMMARY

This Development Permit and associated Development Variance Permit are triggered by a City infrastructure project – the Pandosy Street re-alignment. The re-alignment of this section of Pandosy Street has impacts on a number of residential properties. This application relates to the impacts of the project on the property (and adjacent riparian area) located at 353 Boyce Crescent.

The re-alignment of Pandosy Street impacts parking stalls on the subject property which the City of Kelowna has agreed to relocate on the subject property. As the location of the relocated stalls is within the Mill Creek Riparian Management Area setback, a Development Variance Permit is triggered. In addition, orientation of these relocated stalls on site also triggers several variances to the Parking and Loading section of the Zoning Bylaw.

City staff have engaged an Environmental Consultant who has prepared an Environmental Assessment report which accounts for the impacts of the encroachment of the parking area (and adjacent bridge replacement) on the Riparian Management Area and Mill Creek. This report suggests a variety of mitigation measures to be adopted in the short term and longer term.

3.0 SITE CONTEXT

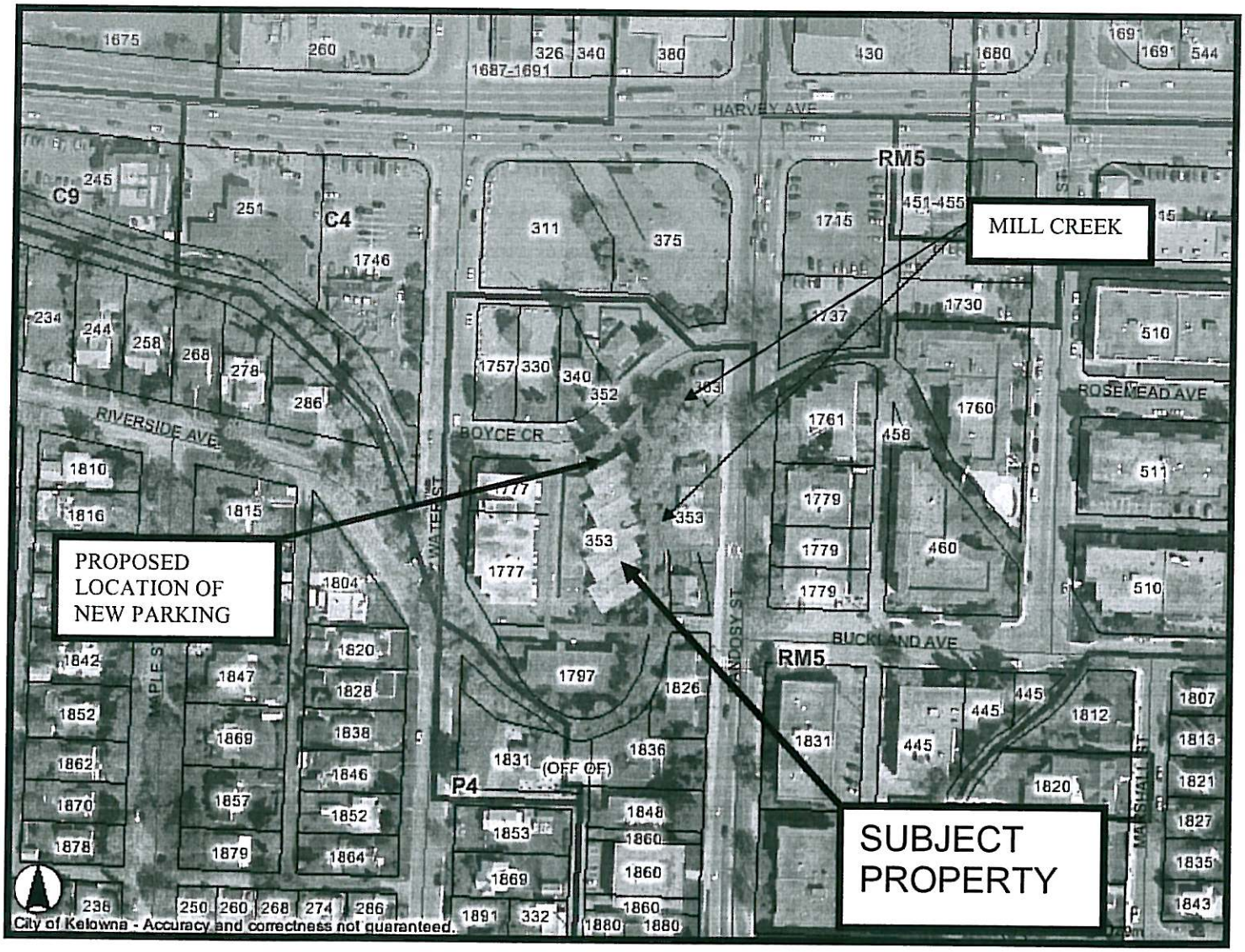
The subject property is located on the south side of Boyce Crescent between Pandosy Street and Water Street.

Adjacent zones and uses are:

North - Re-aligned Pandosy Street
East - RM5 – Medium Density Multiple Housing – Multi-Family Housing
South - RM5 – Medium Density Multiple Housing – Multi-Family Housing
West - RM5 – Medium Density Multiple Housing – Multi-Family Housing

4.0 SITE LOCATION MAP

Subject Property: 353 Boyce Crescent



5.0 TECHNICAL COMMENTS

This application was circulated to various internal departments and external agencies and the following feedback was received:

5.1 Works and Utilities – Environment Division

No concerns subject to the work being completed in accordance with the mitigation plan attached to the Environmental Assessment by Golder Associates Ltd. dated October 2006.

5.2 Ministry of Environment

The Environmental Assessment by Golder Associates Ltd. dated October 2006 concludes that at HADD can be avoided if the best management practices and mitigation measures recommended in the report are implemented as directed. Accordingly, work can proceed under Notification as long as the guidance and direction provided in the Best Management Practices, Mitigation Measures and the Conclusions and Recommendations sections of the above mentioned report are followed.

6.0 PLANNING AND DEVELOPMENT SERVICES DEPARTMENT

Given the overall scope and implication of this project, the Planning and Development Services Department has no concerns with the proposed variances to the Parking and Loading Bylaw and the Mill Creek setback provided the works are completed in accordance with the Environmental Assessment report by Golder Associates Ltd. dated October 2006.

for

Shelley Gambacort
Acting Manager of Development Services

Mary Pynenburg, MRAIC MCIP
Director of Planning & Development Services

MP/SG/rs
Attach.

Golder Associates Ltd.

#220 - 1755 Springfield Road
Kelowna, British Columbia, Canada V1Y 5V5
Telephone (250) 860-8424
Fax (250) 860-9874

REPORT ON

ENVIRONMENTAL ASSESSMENT
PANDOSY STREET BRIDGE REPLACEMENT
KELOWNA, BC

Submitted to:

Stantec Consulting Ltd.
300-1708 Dolphin Avenue
Kelowna, BC
V1Y 9S4

SCHEDULE A
This forms part of development
Permit # DP07-0014/DVP07-0015
Date
Signature

DISTRIBUTION:

1 Copy - Stantec Consulting Ltd.
1 Copy - City of Kelowna
1 Copy - Golder Associates Ltd.

October 2006

06-1440-002 (3000)

BEST EMPLOYERS IN CANADA 2005

EXECUTIVE SUMMARY

Golder Associates Ltd. (Golder) was retained by Stantec Consultants Ltd. (Stantec) to conduct an environmental assessment for the Pandosy Street road alignment and bridge replacement (the Project) in Kelowna, B.C. This study is required to obtain a Development Permit (DP), as the Project involves activities (i.e., land clearing, bridge replacement) near Mill Creek (a.k.a. Kelowna Creek) that alter land designated in the Official Community Plan as being within a Natural Environment Development Permit Area.

The Project is located in downtown Kelowna near the intersection of Boyce Crescent where Mill Creek flows under Pandosy Street (the Site). The Site is located within a highly developed area of downtown Kelowna with several buildings and roadways adjacent to Mill Creek. The Project includes the road re-alignment of Pandosy Street, the construction of a new clear-span bridge over Mill Creek, and the decommissioning of the existing Pandosy Street bridge. The Project is required as part of the east approach improvements conducted by the City of Kelowna in conjunction with the construction of the new Bennett Bridge across Okanagan Lake.

For this environmental assessment, Golder completed a background information review and a biophysical inventory of the Site. The results of the information review and inventory indicate that Mill Creek flows through the Site and is a fish-bearing stream that contains spawning habitat for kokanee *(Oncorhynchus nerka)* and rainbow trout *(Oncorhynchus mykiss)*. Mill Creek contains a concrete retaining wall against the north bank and several willow *(Salix babylonica)* trees within its channel at the Site. There is also a grassed area to the north of the stream which contains several, mostly ornamental, trees. Due to the highly modified and urban nature of the Site, potential habitat for wildlife, specifically wildlife species of management concern, was not present on the Site.

Based on the biophysical inventory and the Project design, there will be work required within the 15 m riparian management area (RMA) of Mill Creek. Additionally, the Project will encroach on the 18.6 m streamside protection and enhancement area (SPEA) as determined by an assessment of the Site using *Riparian Area Regulation* (RAR) methodology. Furthermore, the Project will result in a loss of riparian vegetation totaling approximately 800 m^2 in area. The riparian area that will be impacted is located adjacent to Mill Creek to the north and a small treed area on the south bank, and will result in removal of 23 trees. Compensation for the loss of the riparian vegetation is required to ensure that there will be no net loss of habitat as a result of the Project. The Pandosy Street and bridge area adjacent to Mill Creek has been identified as an area on the Site for riparian planting as compensation. The area totals approximately 800 m^2 and should be

planted with native trees and shrubs, as per the City of Kelowna Parks Departments *Compensation Planting Plan*, to achieve no net loss of habitat.

As the Project involves working adjacent to Mill Creek, there is potential to cause a harmful alteration, disruption or destruction (HADD) of fish habitat. As such, approval from the Department of Fisheries and Oceans and the Ministry of Environment under Section 9 of the *Water Act* to conduct the "Works In and About a Stream" will be required. Golder notes that other than cutting down trees located in the proposed new bridge location and within Mill Creek, there will be no in-stream work involved. The new bridge will be a clear span bridge and all work will be conducted from the top of bank. Furthermore, Golder recommends that the existing bridge footings remain in place during decommissioning of the existing bridge, and only the bridge deck will be required to be removed. Golder concludes that as there is no in-stream work required the proposed work can be conducted outside the recommended window of least risk to fish provided the best management practices and mitigation measures recommended in this report are followed. In addition, a qualified environmental professional conducts environmental monitoring of the Project to assist the contractor with the implementation of the *Spill Prevention and Emergency Response Plan* and the *Sediment and Erosion Control Plan* included with this report.

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1.0 INTRODUCTION

Stantec Consultants Ltd. (Stantec) retained Golder Associates Ltd. (Golder) to conduct an environmental assessment (EA) for the Pandosy Street bridge relocation project (the "Project") as part of the City of Kelowna east approach road improvement work. The Project is being conducted in conjunction with the Ministry of Transportation's construction project of the new Bennett Bridge across Okanagan Lake. The Project is located at the Mill Creek (a.k.a. Kelowna Creek) crossing at the intersection of Boyce Crescent and Pandosy Street (the "Site") within the City of Kelowna. This EA is required to obtain a Development Permit from the City of Kelowna as the Project is located within a Natural Environment Development Permit Area.

1.1 Site Location

The Site is located in downtown Kelowna at the intersection of Pandosy Street and Boyce Crescent, as shown on Figure 1. Bernard Avenue (Highway 97) is located just north of the Site and the Okanagan Lake floating bridge is located approximately 650 m to the west. As shown on Figure 2, the Site is bounded by single family housing to the south, multi-family complexes to the east and west, and commercial businesses to the north. Mill Creek flows underneath the existing Pandosy Street bridge and meanders through the Site flowing west towards Okanagan Lake.

1.2 Project Description

The Project involves the re-alignment of Pandosy Street, the construction of a new bridge crossing over Mill Creek, and the removal of the existing bridge. The Project was designed by Stantec and is shown on Figure 3. The existing bridge structure over Mill Creek will be removed and replaced with a clear-span bridge. A clear-span bridge will completely cross Mill Creek without altering the stream bed or bank. The bridge structures (including bridge approaches, abutments and footings) are built outside of the channel and above the high water mark such that no infilling of the stream channel occurs and stream flows are not constricted or diverted. A clear-span bridge minimizes potential adverse impacts to fish habitat, as no structures are placed within the stream channel or banks so that there is no alteration of natural channel processes. Removal of the existing bridge structure is expected to be limited to the removal of the concrete bridge deck.

1.3 Regulatory Framework

Based on our experience with previous bridge replacement projects, Golder anticipates that approvals may be required from the regulatory agencies listed below.

- Letter of Advice **or** Section 35(2) *Fisheries Act* Habitat Authorization from DFO, if it is determined that any part of the works would result in a HADD; and,
- Section 9 *Water Act* Notification **or** Approval from Ministry of Environment (MoE). A copy of the Section 9, *Water Act* application for "Works In And About A Stream" is provided in Appendix IV.

Should a Habitat Authorization Agreement under the *Fisheries Act* be required then a screening level review and approval of the Project pursuant to the *Canadian Environmental Assessment Act* (CEAA) would be required.

However, potential adverse environmental effects may be avoided and/or minimized through implementation of the environmental mitigation measures and best management practices described in this report such that formal approvals and authorizations by these agencies may not be required. Specific information related to key expected approvals for this project is provided below.

Fisheries Act

The Project may require approval from DFO before it can proceed because it has the potential to affect fish or fish habitats. Fish habitat is considered by DFO both in the context of *riparian* habitat (generally defined as within 30 m from top of bank) and *instream* habitat (i.e. within the normal wetted perimeter). It is anticipated that the proposed works may be approved by DFO via a "Letter of Advice", subject to the environmental planning, mitigation, and enhancement commitments described in this report. .

Water Act

The proposed works are expected to require a Notification to the Ministry of Environment (MoE), pursuant to Section 44 of the *Water Regulation* (BC Reg. 204/88) under the B.C. *Water Act*. Specifically, Section 44(1)(b) of the Water Regulation states the following with respect to changes in and about a stream:

> 44 (1) For the purposes of section 9 of the *Water Act*, the following changes in and about a stream may be made without the necessity of obtaining an approval or license for that change, provided that the change is made in accordance with this regulation and in accordance with the terms and conditions, described in section 42, specified by a habitat officer:

(b) the construction, maintenance or removal of a clear span bridge, provided that

(i) the bridge and its approach roads do not produce a back water effect or increase the head in the stream,

(ii) the equipment used for construction, including site preparation, maintenance or removal of the bridge, is situated in a dry stream channel or is operated from the top of the bank,

(iii) the hydraulic capacity of the bridge is equivalent to the hydraulic capacity of the stream channel, or is capable of passing the 1 in 200 year maximum daily flow, and the height of the underside of the bridge is also adequate to provide free passage of flood debris and ice flows, and

(iv) the bridge material meets the standards of the Canadian Standards Association, as applicable.

Navigable Waters Protection Act (NWPA)

It was determined by Stantec that this project was not subject to the NWPA as this section of Mill Creek is not considered navigable waters.

1.4 Scope of Work

The scope of work for this EA included the following tasks:

- Task 1 – Background Information Review: A desktop review of the available information on the Site including:
    - MoE Water Resources Atlas;
    - BC Conservation Data Centre;
    - Committee on the Status of Endangered Wildlife in Canada (COSEWIC);
    - Species at Risk Act (SARA) Schedule 1;
    - Fisheries Information Summary System (FISS) and FishWizard; and
    - City of Kelowna Official Community Plan.

- Task 2 – Site Reconnaissance: A field reconnaissance of the Site and surrounding area to inventory and assess the biophysical resources. The reconnaissance included a foot traverse of the entire study area and included characterization of the aquatic and terrestrial resources, as well as an evaluation of the potential presence of rare and endangered species at the Site.

- Task 3 – Report Preparation: Based on the findings of the background review and the field reconnaissance, Golder summarized the potential adverse effects of the project on the biophysical resources of the Site, described best management practices and mitigation measures to avoid or minimize potential adverse impacts.

2.0 BIOPHYSICAL INVENTORY, IMPACT ASSESSMENT AND MITIGATION

A biophysical inventory is a detailed account of the biological and physical resources of a Site. A reconnaissance was conducted on May 29, 2006 to inventory the biophysical resources of the Site. Photographs representative of the conditions and features observed during the reconnaissance are presented in Appendix I, and the following sections describe the results of the reconnaissance. Also provided in the following sections is a description of the expected effects the Project will have on the biophysical resources, and recommended measures to mitigate potential adverse effects.

2.1 Soils and Surficial Geology

2.1.1 Biophysical Inventory

The topography of the Site is generally flat, sloping gently to the west towards Okanagan Lake, approximately 650 m west of the Site. The elevation of the Site is approximately 344 m asl. The surficial geology in the general area of the Site consists of alluvial fans, deltas and associated gullies, and stream channel deposits. These deposits may range from coarse boulder-gravel to fine silty sand (Nasmith, 1962).

Based on Golder's subsurface tests (boreholes) conducted on either side of Mill Creek, the soils at the Site consist of a layer of surface fill (1.7 m to 1.8 m thick), a layer of sand and gravel with trace silt (between 2.7 m and 3.1 m thick), followed by interlayered deposits of silty sand, sandy silt, silt and sand (between 6.3 m and 29.0 m thick).

2.1.2 Impact Assessment and Mitigation

It is not anticipated that the bridge replacement work will result in significant impacts to the subsurface soils at the Site. Changes to the existing topography of the Site are expected to be minor as the majority of the road work and bridge construction will require the placement of fill rather than the excavation of material.

As heavy equipment and machinery will be required to conduct work, there is the potential for leaks or spills of hydrocarbons (i.e., diesel, gasoline, oil, grease, etc.) to impact the subsurface. To mitigate the potential effects of contaminants such as hydrocarbons, and to ensure best management practices, the contractor conducting the work should implement the *Spill Prevention and Emergency Response Plan* provided in

Appendix III, including provisions for emergency preparedness and response services, to minimize the occurrence of incidents involving spills, such as re-fueling of construction machinery, and storage and handling of hazardous materials. Included in this plan is the schedule from the *Spill Reporting Regulation* of the *Environmental Management Act*, indicating reportable spills for the substances to be used on the Site.

Among other things, the *Spill Prevention and Emergency Response Plan* addresses the following:

- A general measure of the probability and severity of an adverse effect to health, property, or the environment on the basis of fuel, oil, and other hazardous materials that will be consumed, handled, and stored during the project;
- Spill or release notification and alerting procedures;
- Daily visual inspections of containment systems;
- Protocol to be followed to prevent accidental release of hydrocarbons or lubricants during equipment maintenance;
- Spill incident report forms;
- Containment, recovery, and clean-up procedures, including sufficient training of personnel to deal with environmental emergency situations;
- On-site spill/release clean-up material (i.e., absorbent pads), equipment, and locations; and,
- Names and telephone numbers of persons and organizations that will be contacted in the event of a potential environmental incident.

Should a spill occur, the contractor should submit written incident reports to regulatory agencies with jurisdiction (i.e., MoE, City of Kelowna) within 24 hours of an environmental incident or spill/release. The incident report will identify the date, time, location, amount and type of materials involved, source, and persons or organizations notified. In addition, the report will describe how the spill or release occurred, remedial action taken or planned, and actions necessary to prevent recurrence.

2.2 Vegetation

An Ecoregion classification system has been developed for B.C. to provide a systematic review of the small-scale ecological relationships in the province. There are five hierarchical levels based on macroclimatic processes and physiography: Ecodomains and Ecodivisions place B.C. in a global context and Ecoprovinces, Ecoregions, and Ecosections relate the province to other parts of North America or the Pacific Ocean (Demarchi 1996). The location of the Site in Kelowna, BC, is classified using this system in the following manner:

Table 1
Ecoregion Classification of the Site

Ecodomain	Dry
Ecodivision	Semi-Arid Steppe Highlands
Ecoprovince	Southern Interior
Ecoregion	Thompson Okanagan Plateau
Ecosection	Northern Okanagan Basin

British Columbia has also been divided into biogeoclimatic zones, a classification system founded on topographic and climatic conditions. This classification system uses local climatic processes and landforms reflected by the presence of specific vegetation and wildlife communities. The Site is located within the Very Dry Hot (xh1) subzone and Okanagan variant of the Ponderosa Pine (PP) biogeoclimatic zone. The PP xh1 biogeoclimatic zone is characterized by stands of open ponderosa pine (*Pinus ponderosa*) with an understorey dominated by bluebunch wheatgrass (*Agropyron spicatum*). However, different areas within this zone will have different vegetation assemblages based on the specific environmental characteristics of the site.

2.2.1 Inventory

The vegetation observed at the Site is atypical of vegetation typically associated with the PP xh1 zone. The vegetation consists of some mature, deciduous trees within the stream channel of Mill Creek, and a landscaped area north of Mill Creek containing manicured grass and ornamental trees. As shown on Figure 2, the remainder of the terrestrial portion of the Site is a highly disturbed, urban landscape lacking vegetation. The following table is a list of the vegetation species recorded at the Site.

Table 2
Vegetation Observed During the Site Reconnaissance

Common Name	Scientific Name	Ecology
Trees		
Blue spruce	*Picea pungens*	Common on stream banks and occasionally in mixed forests.
Common ninebark	*Physocarpus opulifolius*	Occurs in dry, to medium wet well-drained soil in full sun to partial shade.
Interior Douglas-Fir	*Pseudotsuga menziesii var. glauca*	Widespread and common on a wide variety of sites at low to mid elevations.
European mountain ash	*Sorbus aucuparia*	Prefers rich moist soils.
Honey locust	*Gleditsia triacanthos*	Occurs on moist, rich bottomlands, as scattered individuals mixed with other broadleaf trees.
Norway spruce	*Picea abies*	Occurs in a variety of moist soils in temperate habitats.

Table 2
Vegetation Observed During the Site Reconnaissance

Common Name	Scientific Name	Ecology
Sycamore	*Platanus occidentalis*	Grows on rich bottomlands and on poorly drained soil.
Pyramid cedar	*Thuja occidentalis*	Ornamental cedar often planted as screens. Requires moist soils in upland or lowland areas.
Tulip-tree	*Liriodendron tulipifera*	Occurs on deep, rich, moist soils along streams or around swampy areas.
Weeping willow	*Salix babylonica*	Common on moist soils, often found near streams, rivers and lakes.
Western yew	*Taxus brevifolia*	Scattered and locally common at low to mid elevations in moist, mature shady coniferous forests and moist depressions and ravines.
Shrubs		
Douglas maple	*Acer glabrum*	Common at low to sub-alpine elevations in dry to moist open forests, openings and clearings, particularly on warm southerly aspects.
Pacific willow	*Salix lucida ssp. Lasiandra*	Widespread and common at low to mid elevations on wet, open sites.
Saskatoon	*Amelanchier alnifolia*	Widespread and common at low to mid elevations in/on dry to moist forests, open, dry warm slopes, moist gullies in grasslands, and disturbed sites.
Tall Oregon grape	*Mahonia aquifolium*	Widespread and common at low to mid elevations in dry plateaus, dry to moist forests, openings and clearings.
Herbs		
Field mint	*Mentha arvensis*	Widespread and common at low to mid elevations in wet seepage sites, wetland edges and lakeshores.
Great burdock	*Arctium lappa*	Scattered weed of low to mid elevations in settled areas along roadsides, pastures, and other disturbed sites.

2.2.2 Impact Assessment and Mitigation

The primary impacts to vegetation at the Site include:

- Loss of plant species during site clearing; and,
- Accidental introduction of invasive, non-native, weed species.

There will be unavoidable losses of vegetation within the Mill Creek stream channel and on the north side of the stream as a result of the bridge replacement work. As shown on Figure 4, a total of 800 m^2 of presently vegetated area will be impacted, including 23 trees. As mitigation, the permanent and unavoidable loss of the existing vegetation will be compensated for by vegetation restoration (i.e., landscaping) following construction. The restoration should achieve no net loss of vegetation as it will re-create approximately 800 m^2 of riparian vegetation where the existing bridge structure is currently located, as shown on Figure 5. As this area will be the jurisdiction of the City of Kelowna Parks Department, they have provided a Compensation Planting Plan presented in Appendix V. The Plan shows the location and provides a list of recommended species to plant. A variety of native and ornamental shrubs and trees will be planted to replace the vegetation

that will be removed for the new bridge. Ongoing irrigation and maintenance of this area will be required by the Parks Department to ensure the survival of the trees and shrubs.

2.3 Species of Management Concern

Species of management concern (i.e., rare and endangered species) may be present at the Site, despite the urban setting within Kelowna. Therefore, Golder conducted a background search of wildlife species that may occur in the area. The B.C. Conservation Data Center (CDC) has developed an evaluation process for species indigenous to the province, and maintains sub-lists (i.e., Red and Blue) for species of management concern.

Table 3
CDC Provincial Conservation Status Ranking

Ranking	Description
Red	Any indigenous species, subspecies or plant community that is Extirpated, Endangered, or Threatened in B.C. Extirpated elements no longer exist in the wild in B.C., but do occur elsewhere. Endangered elements are facing imminent extirpation or extinction. Threatened elements are likely to become endangered if limiting factors are not reversed.
Blue	Any indigenous species, subspecies or community considered to be Vulnerable (Special Concern) in B.C. Vulnerable elements are of special concern because of characteristics that make them particularly sensitive to human activities or natural events. Blue-listed elements are at risk, but are not Extirpated, Endangered or Threatened.

Federally, species ranking is conducted by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), established under Section 14 of the *Species at Risk Act* (SARA). COSEWIC is a committee of experts that assesses and designates, under Sections 15 to 21 of SARA, which wild species of animal, plant, or other organisms are in danger of disappearing from Canada (Environment Canada 2005). Below is a listing of the status categories used by COSEWIC to rank or list a species.

Table 4
COSEWIC Federal Conservation Status Ranking

Ranking	Description
Extinct	A species that no longer exists
Extirpated	A species no longer existing in the wild in Canada, but occurring elsewhere.
Endangered	A species facing imminent extirpation or extinction.
Threatened	A species likely to become endangered if limiting factors are not reversed.
Special Concern	A species that is particularly sensitive to human activities or natural events, but is not an endangered or threatened species.
Data Deficient	A species for which there is inadequate information to make a direct, or indirect, assessment of its risk of extinction.
Not at Risk	A species that has been evaluated and found to be not at risk.

A review of species at risk potentially occurring at the Site was conducted utilizing species lists generated by the CDC and on Schedule 1 of the federal Species at Risk Act (SARA). A copy of the search is provided in Appendix II. The species of management concern with the greatest likelihood of occurring at the Site based on their habitat requirements are listed in Table 5.

Table 5
Species of Management Concern

Common Name	Scientific Name	Status (CDC/COSEWIC)	Habitat
Birds			
Flammulated owl	*Otus flammeolus*	Blue/Special Concern	Uses primarily dry interior Douglas-fir where ponderosa pine may be a co-dominant. Breeding flammulated owls prefer old-growth stands (in B.C., trees > 141 years old), where there are snags containing nesting cavities. The understorey is typically comprised of grasses and low shrubs
Lewis's woodpecker	*Melanerpes lewis*	Red/Special Concern	The most common breeding habitats of Lewis's woodpecker are open, mature ponderosa pine forests; riparian black cottonwood stands adjacent to open areas. Suitable breeding habitat in Canada is restricted to lower mountain slopes and valley bottoms in southern interior British Columbia
Western screech owl	*Otus kennicottii macfarlanei*	Red/Endangered	Deciduous woodlands near streams. Nest in live or dead coniferous or deciduous trees, frequent urban and suburban areas where large trees are present.

Table 5
Species of Management Concern

Common Name	Scientific Name	Status (CDC/COSEWIC)	Habitat
Yellow-breasted chat	*Icteria virens auricollis*	Blue/Endangered	Breeds in dense thickets around wood edges, riparian areas, and in overgrown clearings. Western populations are more or less confined to riparian environments, particularly thickets of wild rose and willow along streams and river oxbows.
Amphibians			
Great Basin spadefoot	*Spea intermontana*	Blue/Threatened	Mainly sagebrush flats, semi-desert shrublands, pinyon-juniper woodland. Breeds in temporary or permanent water, including rain pools, pools in intermittent streams, and flooded areas along streams.

Golder also searched the BC Resources Atlas for the presence of recorded species of management concern occurrences near the Site. The results of the query are provided in Appendix II. There were no species of management concern identified on the Site; however, there was a record of slender hawksbeard (*Crepis atribarba* ssp. *Atribarba)*, a red-listed vascular plant that had been previously identified in the area in 1951. Slender hawksbeard requires dry, open habitat containing, sandy or gravelly soils; therefore, the habitat suitable for slender hawksbeard is not present at the Site.

2.3.1 Inventory

Golder conducted a visual survey of the Site during the reconnaissance for the presence of slender hawksbeard and the species of management concern listed in Table 5. There were no signs of species of management concern at the Site, likely due to the urban setting and disturbed nature of the Site.

2.3.2 Impact Assessment and Mitigation

The primary potential impacts to species of management concern include:

- Accidental introduction of contaminants (i.e., hydrocarbons) into the environment during construction and operation phases; and
- Indirect disturbance (e.g., noise, air emissions) to wildlife species of management concern, particularly during construction.

Potential effects to species of management concern through the potential introduction of contaminants will be minimized by the development and implementation of a *Spill Prevention and Emergency Response Plan.*

Potential effects to species of management concern due to disturbances from construction noise and air emissions from heavy equipment may temporarily alienate or displace wildlife species during the construction phase. However, the types of noise expected to be generated during construction will generally occur at relatively low frequencies. Although critical habitats for wildlife species of management concern are available on the Site, it is expected that wildlife species of management concern will successfully vacate the Site to adjacent similar habitats, either upstream or downstream of the Site prior to and during construction.

Potential effects to bird species of management concern can be minimized by scheduling of Site clearing to avoid nesting seasons, which in the Okanagan is typically from April 1st to July 31st of each year. Should it be necessary to undertake clearing activities during this period, it is recommended that a breeding bird and nest survey be conducted by a qualified biologist to confirm the presence and/or absence of any active nest sites so that appropriate mitigation measures can be taken to minimize contravention of the B.C. *Wildlife Act* and the *Canada Migratory Birds Convention Act.*

2.4 Fish and Fish Habitat

Mill Creek (a.k.a Kelowna Creek) is a multi-use stream providing water for irrigation, livestock watering, wildlife, aquatic life, and drinking water supplies (Gow, 2001). Mill Creek flows through industrial, commercial and residential areas of Kelowna and has been modified by these adjacent land uses, which has adversely affected the water quality and fish habitat. Mill Creek is a known fish-bearing stream, is a direct tributary to Okanagan Lake, and supports the following resident fish populations as listed by the MoE, FishWizard database (2005).

Table 6
Fisheries Information

Common Name	Scientific Name	Conservation Status
Burbot	*Lota lota*	Yellow
Kokanee	*Oncorhynchus nerka*	Yellow
Rainbow trout	*Oncorhynchus mykiss*	Yellow
Redside shiner	*Richardsonius balteatus*	Yellow
Sucker (general)	*Catostomus macrocheilus*	Yellow
Longnose dace	*Rhinichthys cataractae*	Yellow
Peamouth chub	*Mylocheilus courinus*	Yellow
Brook trout	*Salvelinus fontinalis*	Introduced

There is a timing window within which work in a stream will pose the least risk to fish. For Mill Creek the window of least risk is between July 22 and August 31 of each year.

2.4.1 Inventory

The length of Mill Creek where the bridge will be constructed is approximately 54 m, and has an average channel width of 6.2 meters. The stream meanders through the Site with a channel gradient of 0.5 %, and contains a concrete retaining wall on the north bank, and gravel on the south bank. The stream substrate consists primarily of fines (i.e., silt and some gravel) and the channel morphology is riffle-pool with functioning large woody debris (RP_g-w). Fish habitat diversity at the Site is low due to the lack of vegetative cover and in-stream structures. As such, the Pandosy Street bridge area of Mill Creek does not contain good quality habitat for fish. Kokanee spawning habitat is not present at the Site due primarily to the lack of suitable spawning substrate (i.e., silt). However, fish and other aquatic life are present in Mill Creek, although no fish surveys or aquatic surveys were conducted as part of this assessment.

Riparian vegetation at the Site consists of mature weeping willow (*Salix babylonica*) and Douglas maple (*Acer glabrum)* trees located directly within or immediately adjacent to the Mill Creek channel. This riparian vegetation provides shade to Mill Creek, moderating the water temperature. The vegetation also provides allochthonous inputs to the aquatic ecosystem that contributes to the food web and overall water quality of Mill Creek. The roots of the trees armour the stream banks preventing erosion and providing habitat for fish.

The south bank of Mill Creek where the new bridge will be located is denuded of vegetation because of the single family residence and gravel driveway located there (Plan 2602, Lot 3). There are several weeping willows and some grasses and forbs located immediately adjacent to the Mill Creek channel as shown on Figure 4 and Photograph 1 of Appendix I.

On the north bank of Mill Creek, beyond the retaining wall, is a grassed area containing several ornamental trees. This area provides green space within the City of Kelowna and public to access Mill Creek, but does not contain the attributes of functional natural riparian habitat, such as shading or allochthonous inputs.

2.4.2 Impact Assessment and Mitigation

Although Mill Creek is highly modified by urban development and lacks riparian vegetation, it is a fish-bearing stream and a direct tributary to Okanagan Lake. The Project will not involve in-stream work that will directly impact fish within Mill Creek; however, some work is required adjacent to Mill Creek and will have the potential to impact fish habitat. Work that potentially impacts fish habitat of Mill Creek includes the following:

- Construction activities and heavy equipment operating adjacent to Mill Creek;
- Cutting down trees located within the Mill Creek channel;
- Alterations to the concrete retaining wall protecting the north bank of Mill Creek will be required to allow for the footings of the new bridge; and
- Dismantling of the existing Pandosy Street bridge.

Fish and fish habitat are protected by provisions in the Kelowna OCP administered under the *Local Government Act*, and provincially by the recently enacted *Riparian Areas Regulation* (RAR), and federally by the *Fisheries Act*. The City of Kelowna has designated a 15 m riparian management area (RMA) adjacent to Mill Creek, within which an assessment report in support of a development permit is required (i.e., this report). The RAR states that any work planned within 30 m of a watercourse requires an assessment, as work within this area has the potential to cause a harmful alteration, disruption or destruction (HADD) of fish habitat, an offence under Section 35(2) of the federal *Fisheries Act*. A RAR assessment is required to determine the streamside protection and enhancement area (SPEA) for Mill Creek within which no development is allowed. Golder conducted an assessment using RAR methodology and determined the SPEA to be 18.6 m, as measured from the high water mark. However, as the Project involves the construction of a clear span bridge over Mill Creek, it will involve work within the SPEA. As a result, RAR is not applicable, but an Approval under Section 9 of the Water Act is required.

The construction of the new clear-span bridge over Mill Creek is not expected to adversely impact the fish habitat of Mill Creek. The bridge will be constructed above the high water mark of Mill Creek and no construction activity will occur within the stream. Some willow trees growing within the Mill Creek channel will have to be cut down, but their roots will remain and the trees will be compensated for. The removal of the existing bridge is also not expected to have an adverse impact on fish habitat, as the concrete bridge footings should remain in place and only the concrete bridge deck should be removed. As such, Golder recommends that work can be conducted outside the timing window for least risk to fish. However, because the Project is being conducted within the SPEA it has the potential to cause a HADD of fish habitat, so the project will require approval from DFO and MoE. The following best management practices (BMPs) and measures to mitigate potential adverse impacts should be followed to avoid causing a HADD.

Best Management Practices

- ***DFO Land Development Requirements for the Protection of Aquatic Habitat.*** This document (1993) sets out guidelines to protect fish populations and their habitats from the damaging effects of land development activities. It recommends procedures for soil and erosion control, site development, leave strips, stormwater management, in-stream work, and fish passage and culverts.
- ***MOE Standards and Best Practices for In-stream Works.*** This document (2004) sets out provincial standards and recommended best practices for the planning, design and construction of in-stream projects in keeping with the British Columbia Water Act. This document defines a stream, states the legal requirements of both in and near stream works, and provides standard practices for specific types of work, including bridge construction.
- ***MOE Habitat Officer's Terms and Conditions for Changes in and about a Stream, Okanagan Region.*** This document (2005) outlines the terms and conditions that the Okanagan Region habitat officers have specified in accordance with Section 42 (1) of the Water Regulation. These terms and conditions specify such things as the fish and wildlife windows.
- ***MOE Best Management Practices for Amphibians and Reptiles in Urban and Rural Environments in British Columbia.*** This document (2004) sets out guidelines to help maintain the viability of native amphibian and reptile populations in urban and rural areas of British Columbia subject to land development activities. Its primary purpose is to provide developers, consultants, landscape architects, local and regional governments, urban planners, land use managers and the public with the practical, cost-effective tools and supporting scientific information necessary for mitigating development activity impacts on amphibian and reptile populations in the province.

Mitigation Measures

- The existing concrete retaining wall along the north bank of Mill Creek should remain in place; however, if the height of the retaining wall needs to be cut down in sections to accommodate the bridge footings, they should not extend to below the high water mark. The contractor should ensure that debris does not fall into Mill Creek when altering the retaining wall.
- Machinery (i.e., excavators, backhoes) should be clean and free of oil leaks or excess grease when working in the vicinity of Mill Creek. The machinery should be checked daily for fluid leaks and be refueled in a designated area located at least 30 m away from Mill Creek. There should be no fuel stored within 30 m of Mill Creek without secondary containment.
- Equipment and machinery should not be operated within or immediately adjacent to Mill Creek. Operate machinery from a safe distance to avoid accidents or malfunctions. If an accident does occur the contractor should follow the *Spill Prevention and Emergency Response Plan* provided in Appendix III.
- Overland flow and stormwater runoff should be diverted away from exposed soils and denuded areas. Sediment traps and silt fences should be constructed prior to starting earthworks to prevent mobilized sediment from flowing into Mill Creek. Follow the *Sediment and Erosion Control Plan* provided in Appendix IV.
- Construction activities should be limited during periods of heavy precipitation to minimize potential erosion. Also, temporary fills and stockpiles should be covered with polyurethane sheets or tarps.
- Willow trees rooted within the Mill Creek channel should be cut off just above the existing water level. The stumps and roots should remain in place, and not be removed. The removal of felled trees should occur in a manner that does not damage the banks and bed of the stream channel.
- Trees should be felled away from the stream channel unless there is an immediate threat to the public. Branches inadvertently falling into the channel should be removed without disturbing aquatic organisms.
- Upon completion of the new bridge, any exposed stream banks along Mill Creek should be armored with rip-rap for protection from erosion.
- Since the existing bridge footings are located within the stream channel, Golder recommends that they remain in place to avoid unnecessary disturbance of the stream channel. Only the concrete deck of the existing bridge should be removed.
- A qualified environmental professional (QEP) should be contracted to monitor the construction to ensure the BMPs and mitigation measures are properly implemented and functional.

3.0 CONCLUSION AND RECOMMENDATIONS

Golder has conducted an environmental assessment of the Site, which included a biophysical inventory and an assessment of the potential adverse environmental impacts associated with the Project. A description of mitigation measures, including best management practices and habitat compensation have also been provided. The following section provides a summary of this assessment:

- The Project involves re-aligning Pandosy Street, constructing a new clear-span bridge over Mill Creek, and removing the existing Pandosy Street bridge over Mill Creek.
- The Site is located in an urban environment in downtown Kelowna that has been highly disturbed by past land use practices. However, due to the presence of Mill Creek flowing through the Site, it is in a designated Natural Environment Development Permit area.
- The vegetation at the Site consists of willow trees within or adjacent to the Mill Creek channel and a small landscaped area containing grass and ornamental trees to the north of Mill Creek.
- Due to the disturbed nature of the Site and the urban environment, the Site does not contain high quality habitat for species of management concern. A survey of the Site was conducted for species with greatest likelihood of occurring on the Site based on their habitat requirements but no species or signs were observed.
- The Project will involve the unavoidable loss of approximately 800 m^2 (0.08 ha) of riparian vegetation. Mitigation for this loss involves the replacement of this riparian habitat through a restoration program that will naturalize previously disturbed areas of the Site, and ensure no net loss of riparian vegetation.
- The Project does not involve in-stream work; however, it does encroach on the SPEA, which has the potential to cause HADD of fish habitat. A HADD can only be determined by DFO, but Golder concludes that provided the best management practices and mitigation measures recommended in this report are implemented as directed, a HADD can be avoided.
- As the project does not involve in-stream work and considering the length of construction time it would take to complete the Project, Golder concludes that the work can proceed outside the recommended timing for least risk to fish (Jul 22 – Aug 31) provided the recommended mitigation measures and best management practices are followed.
- Approval from or Notification to MoE to conduct works in and about a stream is required under Section 9 of the *Water Act*, and approval from DFO under Section 35(2) of the *Fisheries Act* is required, either by way of a Letter of Advice or as an Authorization Agreement.

Based on the above conclusions, Golder makes the following recommendations:

- Obtain the necessary approvals and authorizations from the regulatory agencies prior to conducting any work. Allow for at least 60 days for the approval process.
- Follow measures outlined in the *Spill Prevention and Emergency Response Plan.*
- Follow measures outlined in the *Sediment and Erosion Control Plan.*
- Limit the amount of disturbance to the riparian area of Mill Creek and avoid the in-stream habitat of Mill Creek.
- Schedule site clearing work that involves vegetation removal within the window that presents the least risk to nesting birds. The least risk window for raptors, including eagles, hawks, falcons and owls, and herons is between August 15 and January 30. The least risk window for most other birds is between August 1 and March 31.
- Conduct vegetation restoration to replace the unavoidable loss of riparian vegetation where the new clear-span bridge will be located. The restoration will total 800 m^2 in area as shown on Figure 5, and will involve planting native and some ornamental trees and shrubs as per the City of Kelowna Parks Department *Compensation Planting Plan.*
- Where available, stabilize the banks of any exposed, un-vegetated areas of the Mill Creek streambank to prevent erosion. Rip-rap armoring can be used for bank stabilization.
- Environmental monitoring of the Project by a QEP to assist and report on the proper implementation and functionality of the BMPs and mitigation measures recommended in this report. The QEP should provide weekly monitoring reports to the City and a final summary report upon completion of the Project.

4.0 LIMITATIONS AND USE OF REPORT

This report was prepared for the exclusive use of the Stantec, and is intended to provide an environmental assessment for the relocation of Pandosy Street bridge over Mill Creek in Kelowna, B.C. Stantec may submit this report to regulatory agencies as part of the approval process for this project.

The scope of this environmental assessment is limited to an assessment of potential environmental effects associated with the proposed development on the biophysical conditions and resources at the site. Furthermore, this assessment is not intended to identify or evaluate potential effects of contaminants that may occur at or near the subject project area as a result of historical activities, the presence of underground or other utilities, or potential effects to archaeological resources at the site.

The inferences concerning the conditions of the site are based on information obtained from a limited review of available literature and data, and a site reconnaissance conducted by Golder personnel. No extensive wildlife, vegetation or air quality studies, and no archaeological, groundwater, or soils investigations were conducted. In evaluating the proposed development, Golder has relied in good faith on information provided. We accept no responsibility for any deficiency or inaccuracy contained in this report as a result of our reliance on the aforementioned information.

The findings and conclusions documented in this report have been prepared for the specific application to this project and have been developed in a manner consistent with the level of care normally exercised by environmental professionals currently practicing under similar conditions in the jurisdiction. Golder makes no other warranty, expressed or implied.

Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. Golder accepts no responsibility for damages, if any suffered by any third party as a result of decisions made or actions based on this report.

5.0 CLOSURE

We trust that the information contained in this report meets your present requirements. Please contact us if you have any questions or concerns regarding the above.

Yours truly,

GOLDER ASSOCIATES LTD.

Drew Kaiser, B.Sc., BIT
Environmental Scientist

for

Jason Marzinzik, B.Sc.
Fisheries Biologist

Duncan Hendricks, R.P.Bio.
Managing Associate, Senior Aquatic Biologist

JM/DK/SR/RP/kc

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6.0 REFERENCES CITED OR CONSULTED

Best Management Practices for Amphibians and Reptiles in Urban and Rural Environments in British Columbia. (November 2004). Prepared by BC Ministry of Environment formerly the Ministry of Water, Land and Air Protection Ecosystem Standards and Planning Diversity branch.

Chilibeck, et al. 1992. Land Development Guidelines for the Protection of Aquatic Habitat. Prepared by Department of Fisheries and Oceans and BC Ministry of Environment formerly the Ministry of Environment, Lands and Parks.

Cranston, et al. 2005. Field Guide to Noxious Weeds and Other Selected Invasive Plants of British Columbia. Ministry of Agriculture, Fisheries and Food, BC.

Dunn, J. 1999. Field Guide to the Birds of North America. National Geographic, Third Edition. Washington, DC.

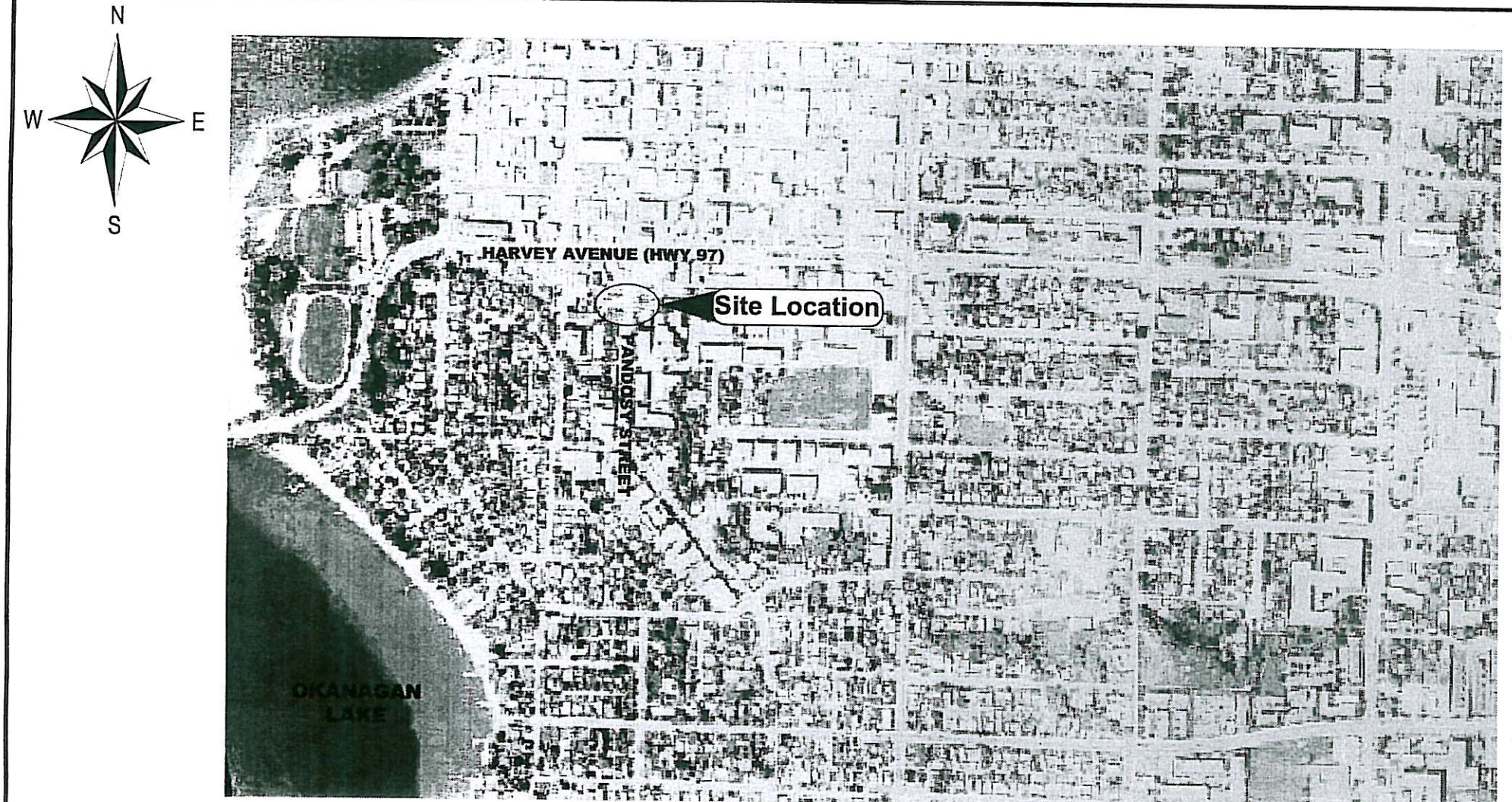
Farrar, J. 1997. Trees in Canada. Fitzhenry & Whiteside Limited, Third Edition. Markham, Ontario.

Gow, et al. 2001. Bioengineered Solutions in the Mill Creek Watershed. Erosion Control. Santa Barbra, CA.

MSRM. 2005. Fisheries Information Summary System (FISS) database maintained by B.C. Ministry of Sustainable Resource Management. http://srmapps.gov.bc.ca/apps/fidq/fissReportProcess.do

Parish, et al. 1996. Plants of southern Interior British Columbia. Lone Pine Publishing, Vancouver, BC.

Standards and Best Practices for Instream Works. (2004) Prepared by BC Ministry of Environment formerly the Ministry of Water, Land and Air Protection Ecosystem Standards and Planning Diversity branch.



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SCALE METRES

MAP REFERENCE: CITY OF KELOWNA WEBSITE, "http://www.city.kelowna.bc.ca/", IMAGE DATED 2003.

PROJECT
STANTEC
ENVIRONMENTAL ASSESSMENT
PANDOSY STREET, BRIDGE REPLACEMENT

TITLE
KEY PLAN

Golder Associates
Kelowna, BC

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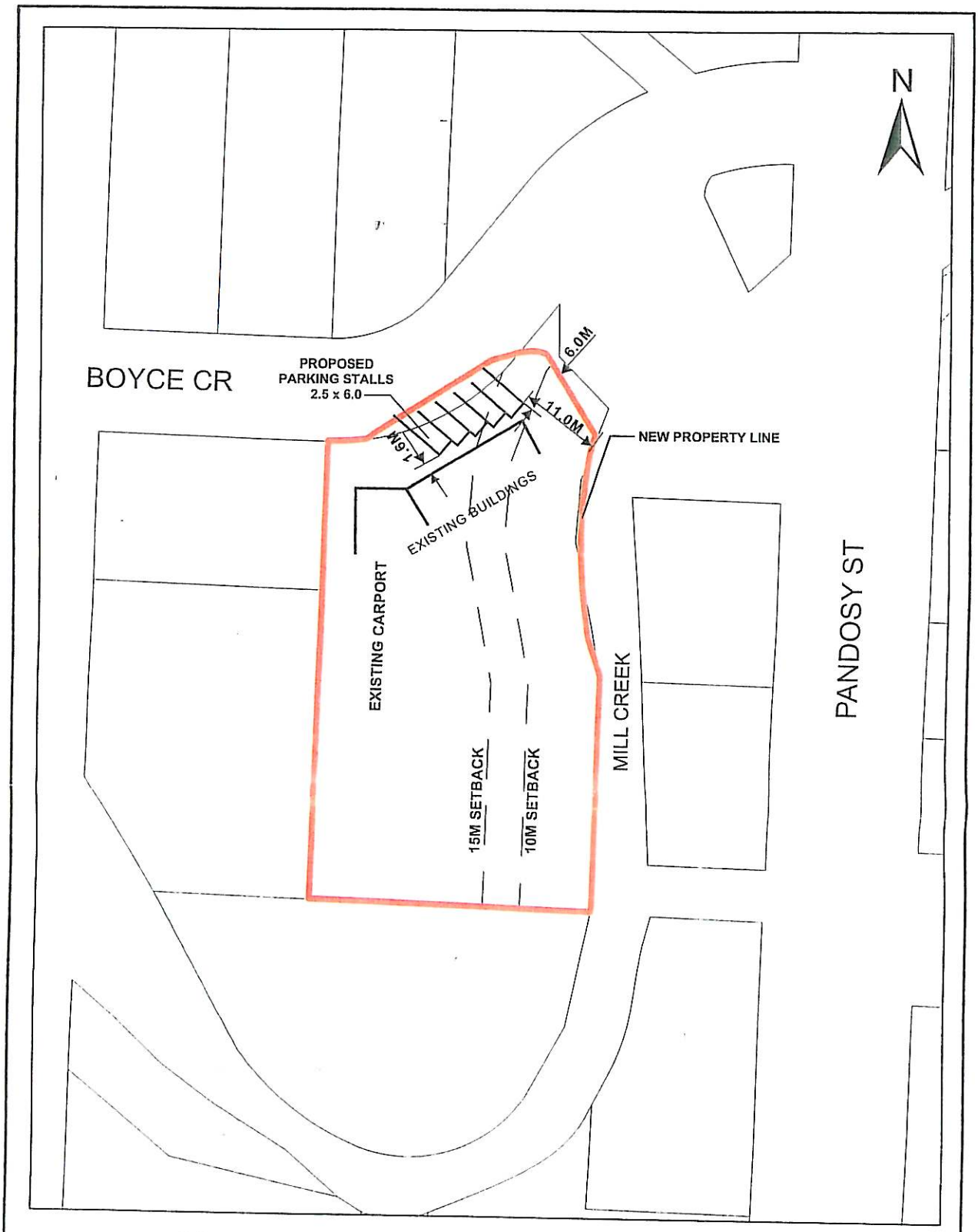

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SEC. _____ TWP. _____

PROPOSED PROERTY LINE PROPOSED CONSOLIDATED LOT.

VARIANCES REQUESTED

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VARYING FORWARD ENTRY & EXIT 8.3.2 (B)
VARYING PUBLIC STREET USED FOR ISLE ACCESS 8.3.3

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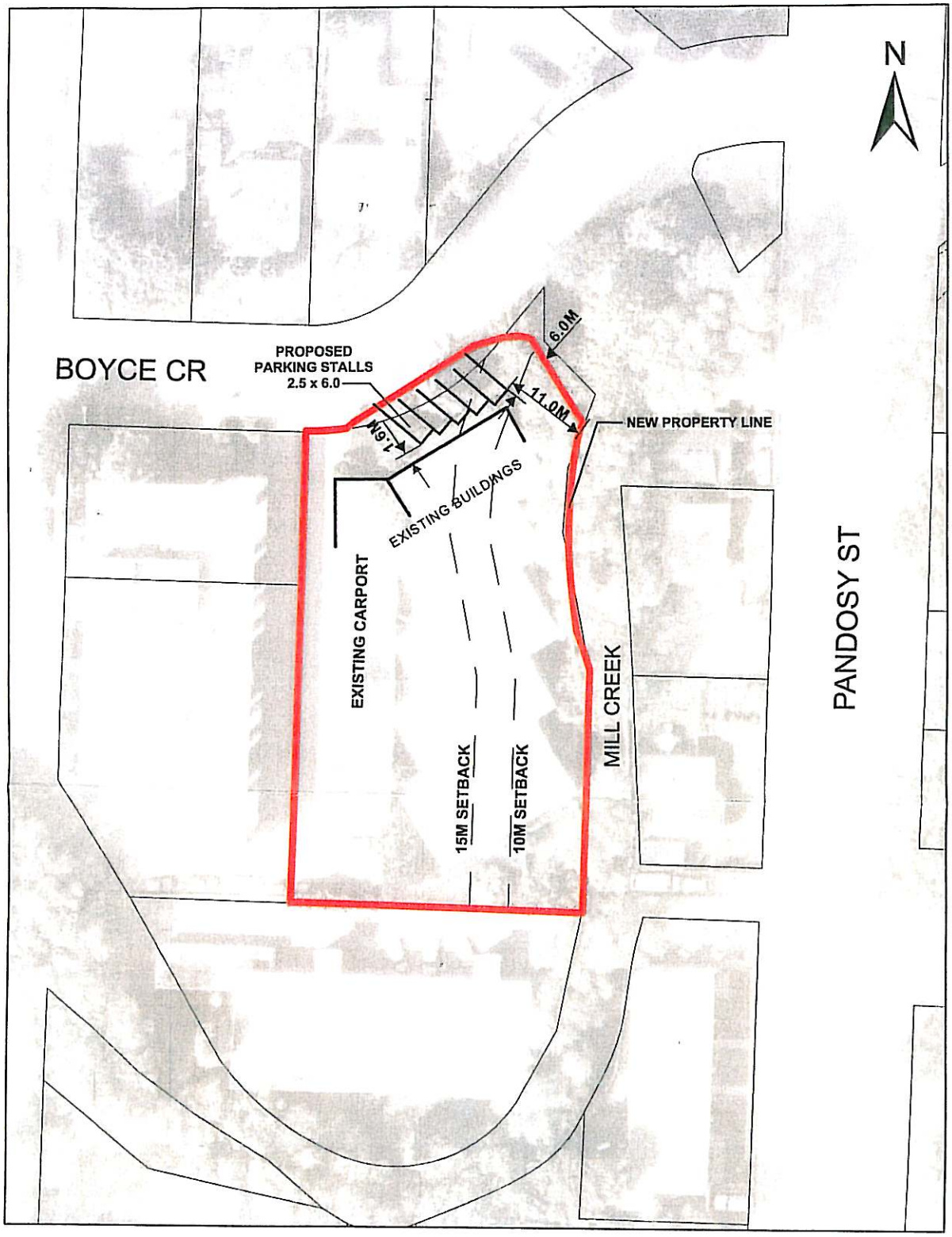

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