



**FortisBC Inc.**

**2009 System Development Plan Update**

**("2009 SDP Update")**

**June 27, 2008**

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## 1. Executive Summary

FortisBC Inc.'s 2005-2024 System Development Plan ("2005 SDP") filed with the British Columbia Utilities Commission ("Commission") on November 26, 2004 identified necessary reinforcements in the Company's bulk transmission system, the regional transmission and distribution systems, the telecommunication and SCADA networks, and protection systems. The 2005 SDP outlined the sustaining projects directed at maintaining existing facilities and modernizing obsolete equipment; and growth projects required to serve increasing load, driven by population growth and the new commercial activities in the FortisBC service area. In Order G-52-05 the Commission Panel encouraged FortisBC to treat this plan as a living document, to continue to consult with stakeholders and to keep the plan current as it evolves. In 2006 and 2007 updates to the 2005 SDP were filed with the Company's 2006 and 2007/08 Capital Expenditure Plans. An effective System Development Plan must be responsive to changing circumstances that may arise from variations in load growth rates or location, or from results of equipment condition assessments. This report ("2009 SDP Update") outlines the changes to the original as well as the 2007 project plan schedule and provides a summary of the upcoming two year capital expenditure plan necessary to maintain the integrity of the existing electrical system and to meet new customer demand within the FortisBC service territory. The current status of all projects identified in the 2005 SDP is summarized in the tables in Appendix 2.

The current load forecast developed in the first quarter of 2008 is included as Appendix 2. It continues to show a high level of load growth in the north and south Okanagan areas with average winter growth rates exceeding 5 percent, and 3 percent respectively over the next five years. The Kootenay and Boundary areas continue to experience modest growth with an average annual growth rate of less than 2 percent over the next five years.

Appendix 3 provides the cost and schedule for the various projects identified in the 2005 SDP that will be completed in 2009 and 2010. They have been updated for inflation, currently approved overheads and Allowance for Funds Used During Construction ("AFUDC") rates.

Expenditures in the 2009-2010 timeframe increased from \$150.3 million as originally scheduled to \$251.1 million in the 2009 SDP Update. The changes are primarily attributable to increases in

1 the Okanagan Transmission Reinforcement (OTR), Black Mountain, Benvoulin, Naramata  
2 projects and the addition of the 20 Line and 27 Line rebuild, Copper Conductor Replacement and  
3 other sustaining projects; offset somewhat by the rescheduling of the Huth Substation rebuild  
4 and the Grand Forks Conversion and Distribution Source projects.

5 The major changes between the 2007 SDP Update and the 2009 SDP Update are summarized  
6 below by category. The details of each are included in the 2009 SDP Update.

## 7 **Transmission Growth**

### 8 **Project Timing**

- 9 1. Unanticipated delays and scope refinement have shifted the substantial completion  
10 date of the OTR Project from 2009 to 2010.
- 11 2. Unanticipated delays for the Black Mountain Distribution Source project have  
12 deferred a significant portion of this project from 2008 to 2009.
- 13 3. The 2010 Fault Level Reduction Project has been cancelled as a result of an  
14 investigation and subsequent report contained as Appendix 8 in the 2007/08 Capital  
15 Plan. The report concluded that upon completion of Glenmore in 2007, no further  
16 action was required in the foreseeable future.
- 17 4. The Braeloch Distribution Source Project has been deferred from 2010 as a result of  
18 load relief provided by the construction of the Benvoulin Substation.
- 19 5. Unanticipated delays for the Naramata project have deferred a significant portion of  
20 this project from 2007 to 2009.
- 21 6. Huth Substation rebuild has been deferred from 2010 to 2011 to avoid conflicts with  
22 the OTR construction schedule.
- 23 7. Grand Forks Conversion and Distribution Source have been deferred from 2010 to the  
24 2011+ timeframe due to uncertainty associated with the load in that area.

**Changing Scope and new projects**

1. The scope of the proposed OTR Project has been updated as the detailed engineering has progressed. It now includes items that were not specifically defined in the 2005 SDP.

2. The Tarrys Substation upgrade project is a new project for 2009 to address load at that station.

**Transmission Line Sustaining** – Forecast changes in this category have occurred primarily due to:

1. The requirement for increased transmission right-of-way expenditures associated with the removal of trees damaged from the Pine Beetle infestation problem;

2. The requirement to upgrade specific transformer and substation protection to provide appropriate levels of protection and improve service reliability; and

3. The requirement to rebuild sections of 20 Line and 27 Line and to rehabilitate 30 Line in order to provide appropriate levels of safety and service reliability.

**Stations Sustaining** – The most significant changes associated with this category are attributable to:

1. The completion of the DG Bell bulk oil breakers replacement project in 2010 has been deferred to 2011;

2. Slocan City–Valhalla is a new project for 2009 to rectify issues associated with the existing Slocan City transformer and substations;

3. The Passmore Substation upgrade project is a new project for 2010 to address deficiencies associated with the existing transformer and line protection; and

4. The Princeton Substation upgrade is a new project for 2010 to address deficiencies associated with the deterioration of the existing reclosers.

1 **Distribution Growth** – The changes in this category are explained primarily by:

- 2 1. Forecast higher customer growth rates and subsequent increase in construction  
3 associated with the need to provide service; and
- 4 2. The addition of new projects to increase the capacity of existing distribution circuits in  
5 order to deliver voltage levels within acceptable limits.

6 **Distribution Sustaining** – The changes in this category are explained primarily by:

- 7 1. The requirement for increased distribution right-of-way expenditures associated with the  
8 removal of trees damaged from the Pine Beetle infestation problem;
- 9 2. The recognition of the safety issues associated with hot tap connectors has resulted in  
10 increased activity in the rehabilitation project; and
- 11 3. An assessment of aged copper conductor which has identified the conductor as a safety  
12 and reliability issue.

13 **Telecommunications** – The change in this category are due primarily to the deferral of the  
14 Grand Forks to Trail high capacity communications link in conjunction with the Grand Forks  
15 Conversion Project.

16 The execution of the projects listed in the 2009/10 Capital Plan will complete all of the major  
17 projects outlined in the original 2005 SDP with the exception of those that have been deferred or  
18 cancelled as previously discussed. With the completion of these major projects as summarized  
19 in Appendix 2, it is essential that the Company develop another long range plan, taking into  
20 account the significant impact that these projects have had on the electrical system and to take  
21 into account the continued high levels of growth within specific sections of the service territory.  
22 In 2010/11 the Company will file a new Long Term System Development Plan with details for  
23 the five year period (2011-2015). The 2010/11 filing will reflect the impact of major projects  
24 that have been completed since 2004 and results of the Company's Resource Plan as well any  
25 changes to legislation that may affect public utility filing requirements.

## 1   **2. Plan Update by Category**

2   The following sections outline the projects as originally identified by the 2005 SDP. Project  
3   information from the 2007 SDP Update is restated in italics for reference and is followed by the  
4   2009 updated information. Appendix 3 shows the 2007 updated project schedule and estimated  
5   costs for 2009/10 projects as well as the 2009 updated schedule and estimates for 2009 and 2010.

### 6   **2.1 Transmission and Stations (Growth)**

7   The 2009 SDP Update contains a number of changes from the 2007 SDP Update. The major  
8   factor influencing changes to the Transmission and Station (Growth) projects is the OTR Project  
9   as well as unanticipated delays in other projects.

10   The 2008 load forecast showing actual loads for the past five years, together with forecast winter  
11   and summer loads for the next six years is found in Appendix 2.

#### 12   **2.1.1 Bulk Transmission System**

13   The 2009 SDP Update continues to forecast a high level of load growth in the north and south  
14   Okanagan areas with average winter growth rates exceeding 5 percent and 3 percent respectively  
15   over the next five years. The Kootenay area and Boundary areas continue to experience modest  
16   growth with an average annual growth rate of less than 2 percent over the next five years.

17   The 2005 SDP proposed that due to the high load growth and concern with security of supply for  
18   the City of Kelowna, the following projects should be undertaken, subsequent to the completion  
19   of the South Okanagan Supply Reinforcement Project in 2006.

20   The four projects listed in this category have been grouped and are currently referred to as the  
21   Okanagan Transmission Reinforcement Project (“OTR”). An application for a CPCN for the  
22   OTR Project was filed with the Commission on December 14, 2007. An oral hearing is  
23   scheduled for June 23, 2008.

### 2.1.1.1 Vaseux Lake Terminal to Anderson Terminal 230 kV Circuit:

The conversion of the existing 161 kV circuit to 230 kV and construction of a second 230 kV circuit between Vaseux Lake Terminal and RG Anderson Terminal stations in the 2007/09 timeframe.

This also involves the expansion of the 230 kV ring bus in RG Anderson Terminal station and reconfiguration of the existing 168 MVA Transformer 2 for 230 kV operations.

**2007 UPDATE:** *This project is unchanged. An application for a CPCN for the OTR Project is anticipated to be filed with the Commission in 2007.*

**2009 UPDATE:** An application for a CPCN for the OTR Project was filed with the Commission on December 14, 2007. An oral hearing is scheduled for June 23, 2008.

### 2.1.1.2 New Bentley Terminal Station

The construction in 2008/09 of a new Bentley Terminal station near Oliver, supplied by a 230 kV line from Vaseux Lake Terminal station.

This terminal station would be equipped with 230 kV, 161 kV and 138 kV buses and would serve Oliver Terminal station to the west, Grand Forks Terminal station to the east and the Osoyoos area to the south.

**2007 UPDATE:** *This project is currently scheduled for the 2008/10 timeframe. An application for a CPCN for the OTR Project is anticipated to be filed with the Commission in 2007.*

**2009 UPDATE:** An application for a CPCN for the OTR Project was filed with the Commission on December 14, 2007. An oral hearing is scheduled for June 23, 2008.



### 2.1.1.3 Kelowna Switched Shunts and Static var Compensator

The installation of approximately 30 MVA of shunt capacitors at both DG Bell Terminal and FA Lee Terminal stations in 2008/09 to provide adequate voltage support for loss of the 230 kV lines between FA Lee Terminal station and Vernon.

***2007 UPDATE:** This project is currently scheduled for the 2010 timeframe. An application for a CPCN for the OTR Project is anticipated to be filed with the Commission in 2007.*

**2009 UPDATE:** An application for a CPCN for the OTR Project was filed with the Commission on December 14, 2007. An oral hearing was held on June 23, 2008. Expenditures for the capacitors at DG Bell and FA Lee were included in the OTR CPCN. While justifications for the Static var Compensator (SVC) were discussed in the OTR CPCN application, approval for this component was not requested as part of the OTR Project. Instead FortisBC intends to file a separate CPCN application for the SVC installation in 2010.

### 2.1.1.4 Vaseux Lake Terminal Station Transformer 3

Preparatory work for the installation of a third transformer (T3) at Vaseux Terminal station in 2009 with installation occurring in the 2011+ timeframe.

***2007 UPDATE:** An application for a CPCN for the OTR Project is anticipated to be filed with the Commission in 2007 and will address the preparatory work. The installation is unchanged.*

**2009 UPDATE:** While this transformer installation is not a component of the proposed OTR Project, the future work is discussed in the project CPCN application filed with the Commission on December 14, 2007. An oral hearing was held on June 23, 2008.

## 1   **2.1.2 Okanagan Region**

2   The Okanagan region consists of Kelowna, Penticton, Summerland, Oliver-Osoyoos, and  
3   Princeton-Keremeos.

### 4   **2.1.2.1 Kelowna:**

5           The 2005 SDP identified the Kelowna area as the fastest growing part of the FortisBC  
6           system and one of the fastest growing urban centres in British Columbia. The load  
7           addition resulting from that growth has resulted in a requirement for a number of  
8           subtransmission and station projects. The 2009 SDP Update shows that the forecast  
9           loads for the stations in the Kelowna area continue to exceed the 2004 forecast.

10          As a result of forecast customer and load growth in this area the following projects  
11          were identified in the 2005 SDP:

#### 12          **(a) Big White 138 kV Line and Substation**

13          Construction of a substation at the Big White ski resort to be served via a 138 kV  
14          transmission line from the Joe Rich Substation as well as a distribution upgrade in the  
15          2005/07 timeframe.

16          **2007 UPDATE:** *The project is now scheduled for the 2006/08 timeframe. An*  
17          *application for a CPCN was filed in March 2006 and an oral public hearing was held*  
18          *on July 4 and 5, 2006.*

19          **2009 UPDATE:** This project has received CPCN approval by Commission Order C-  
20          17-06. Construction of the new transmission line (57 Line) was completed in 2007, the  
21          substation is scheduled to be completed in 2008.

#### 22          **(b) Ellison Distribution Source Substation**

23          Construction of a distribution source substation (Ellison) approximately 5.5 kilometres  
24          north of the Sexsmith Substation in 2006/07. Included in this station project are four

1 13 kV lines out of the station to connect the station to the existing distribution in the  
2 Ellison and Glenmore area and a transmission line from the Duck Lake Substation.

3 **2007 UPDATE:** *This project is unchanged. An open house for this project was held*  
4 *on July 6, 2006. An application for a CPCN for this project is anticipated to be filed*  
5 *with the Commission in the third quarter of 2006.*

6 **2009 UPDATE:** This project has received CPCN approval by Commission Order C-4-  
7 07 and is scheduled to be completed in 2009.

### 8 (c) **Black Mountain Distribution Source Substation Project**

9 Construction of a distribution source substation (Black Mountain) approximately 5  
10 kilometres east of the Hollywood Substation in the 2008 timeframe.

11 **2007 UPDATE:** *This project is unchanged. An application for a CPCN for this*  
12 *project is anticipated to be filed with the Commission in the fourth quarter of 2006.*

13 **2009 UPDATE:** This project has received CPCN approval by Commission Order C-7-  
14 07 and is scheduled to be completed in 2009.

### 15 (d) **Fault Level Reduction**

16 Installation of current limiting reactors in Kelowna area substations in 2005/06.

17 **2007 UPDATE:** *Detailed engineering has identified that many of the substations do*  
18 *not have adequate space for the additional reactors, resulting in a requirement for*  
19 *major reconfiguration at these sites. This has caused FortisBC to investigate alternate*  
20 *solutions for the sites. A solution will be implemented at Glenmore Substation in 2006,*  
21 *however other sites will be rectified in future as upgrades take place at these*  
22 *substations. Work practices and changes to protection settings have been implemented*  
23 *to reduce the impact of high fault levels at these sites. A report titled “FortisBC*  
24 *Distribution Substation Fault Level Control Guidelines” is filed as Appendix 8 of the*  
25 *2007/08 Capital Plan.*

1           **2009 UPDATE:** A solution has been implemented at Glenmore Substation. As no  
2           other substations require attention in the foreseeable future, this project is considered  
3           complete.

4           **(e) Loop Kelowna 138 kV Circuits**

5           Installation of circuit breakers and modification of existing bus networks to enable the  
6           operation of the 138 kV sub transmission in Kelowna as a looped network. The  
7           engineering for this project was scheduled for 2006 with construction scheduled for the  
8           2007/09 timeframe.

9           **2007 UPDATE:** *This project has been deferred to the 2010/12 timeframe due to other*  
10          *major projects that are occurring in the Kelowna area. The application for a CPCN*  
11          *for the proposed Ellison project will contain details of a transmission loop for the*  
12          *Sexsmith, Ellison and Duck Lake substations.*

13          **2009 UPDATE:** The transmission loop for the Sexsmith, Ellison and Duck Lake  
14          Substations has been scheduled for 2011+ timeframe. The other network loop projects  
15          have been deferred to the 2012+ timeframe and will be further assessed as part of the  
16          2011 long range plan.

17          **(f) Recreation Capacity Upgrade**

18          Installation of a new 138/13 kV distribution transformer and associated protection at  
19          the Recreation Substation in the 2008 timeframe.

20          **2007 UPDATE:** *The load growth in this area has allowed deferral of this project to*  
21          *2010.*

22          **2009 UPDATE:** This project is scheduled for 2010.

1           **(g) Hollywood Capacity Upgrade**

2           Installation of a new 138/13 kV distribution transformer and associated protection at  
3           Hollywood substation in the 2008 timeframe.

4           **2007 UPDATE:** *Cancelled. An analysis of the load growth patterns in Kelowna*  
5           *indicates that the preferred solution for the load growth in the central/south Kelowna*  
6           *area is to construct a distribution source substation in the Casorso Road and*  
7           *Benvoulin Road area. This project is included in the Benvoulin Substation project and*  
8           *is scheduled for the 2008/09 timeframe.*

9           **2009 UPDATE:** A CPCN application for the Benvoulin Project will be filed with the  
10           Commission in the third quarter of 2008. This project is scheduled to be completed in  
11           2010.

12           **(h) Braeloch (SW) Kelowna Distribution Source Substation**

13           Construction of a distribution source substation (Braeloch) in southwest Kelowna in the  
14           2010/11 timeframe.

15           **2007 UPDATE:** *This project is unchanged.*

16           **2009 UPDATE:** The load relief provided by the Benvoulin Substation project has  
17           allowed this project to be deferred to the 2014+ timeframe. Funds have been included  
18           in the 2009/10 Capital Plan under the “Kelowna Distribution Capacity Requirements”  
19           to undertake necessary investigative studies associated with this project.

20           **(i) OK Mission Capacity Upgrade**

21           Installation of a new 138/13 kV distribution transformer and associated protection at  
22           the OK Mission substation in the 2011+ timeframe.

23           **2007 UPDATE:** *Cancelled. An analysis of the load growth patterns in Kelowna*  
24           *indicates that the preferred solution for the load growth in the central/south Kelowna*  
25           *area is to construct a distribution source substation in the Casorso Road and*

1            *Benvoulin Road area. This project is included in the Benvoulin Substation project and*  
2            *is scheduled for the 2008/09 timeframe.*

3            **2009 UPDATE:** A CPCN application for the Benvoulin Project will be filed with the  
4            Commission in the third quarter of 2008. This project is scheduled to be completed in  
5            2010.

6            **(j) NEW - 2007 - Benvoulin Substation:** This project replaces the Hollywood and  
7            OK Mission Capacity Upgrade Projects.

8            **2009 UPDATE:** A CPCN application for the Benvoulin Project will be filed with the  
9            Commission in the third quarter of 2008. This project is scheduled to be completed in  
10           2010.

11           **(k) NEW - 2007 - Duck Lake Regulator Bank:** Load growth at the Duck Lake  
12           Substation has exceeded the capacity of the voltage regulators located at the substation  
13           and will require replacement in 2007.

14           **2009 UPDATE:** Complete

15           **(l) NEW - 2007 - Glenmore 6 – New Feeder:** Addition of a circuit breaker at the  
16           Glenmore Substation to accommodate a new feeder (Feeder 6).

17           **2009 UPDATE:** Complete.

18           **(m) NEW - 2007 - North Kelowna Transformer Addition:** Current load growth  
19           patterns indicate that a transformer will be required at one of the north Kelowna  
20           substations (Duck Lake, Ellison and Sexsmith) in the 2012+ timeframe.

21           **2009 UPDATE:** Funds have been included in the 2009/10 Capital Plan under the  
22           “Kelowna Distribution Capacity Requirements” to undertake necessary investigative  
23           studies associated with this project.

1           **(n) NEW - 2009 - Kelowna Distribution Capacity Requirements:** Forecasted load  
2 growth patterns indicate a need for additional distribution capacity in the greater  
3 Kelowna area in the 2011+ timeframe. Funds have been included in the 2009/10  
4 Capital Plan to undertake necessary investigative studies associated with this project.

#### 5   **2.1.2.2 Penticton - Summerland**

6           This area has seen modest growth over the past number of years. The 2005 SDP  
7 identified the following projects for the 2006/11+ period:

##### 8           **(a) Naramata Substation Replacement**

9           Rebuilding of the Naramata Substation in the 2005/06 timeframe.

10           ***2007 UPDATE:** The requirement for the Naramata project is unchanged. The project*  
11 *was approved by Order G-52-05. Property acquisition has taken longer than expected,*  
12 *however, it is anticipated that the new substation (Arawana) being in service by early*  
13 *2007.*

14           **2009 UPDATE:** Unanticipated delays have deferred the completion of this project to  
15 2009.

##### 16           **(b) Summerland 63 kV Backup**

17           Construction, in the 2009/10 timeframe, of a new 63 kV line from the Huth Substation  
18 to the Trout Creek Substation or from the Huth Substation to the Summerland  
19 Substation to provide backup for the Summerland area.

20           ***2007 UPDATE:** This project has been rescheduled to the 2012+ timeframe to align*  
21 *with the Huth Substation rebuild project.*

22           **2009 UPDATE:** This project is unchanged and will be updated as part of the 2011  
23 Long Term System Development Plan.

1           **(c) Huth Substation Rebuild**

2           Rebuilding of the 63 kV bus and line terminations at the Huth Substation in the 2010  
3           timeframe.

4           **2007 UPDATE:** *This project is unchanged.*

5           **2009 UPDATE:** The completion of this project requires 41 Line and 42 Line to be out  
6           of service however, the completion of the OTR Project requires that 76 Line be out of  
7           service. Outages on 41 Line or 42 Line at the same time as 76 Line is out, increases the  
8           risk of interruptions to customers in this area. Consequently the Huth Substation  
9           Rebuild project is rescheduled to 2010/2011 following the completion of the OTR  
10          Project.

11          **(d) NEW - 2007 - Westbench Regulator Bank:** Load growth at the Westbench  
12          substation has exceeded the capacity of the voltage regulators located at the substation  
13          and requires replacement in 2007.

14          **2009 UPDATE:** Complete.

15    **2.1.2.3 Oliver - Osoyoos**

16          The 2005 SDP load growth in the Oliver-Osoyoos area is forecast to exceed the system  
17          average. The growth is predominantly due to migration from urban centres outside of  
18          the Okanagan.

19          The 2005 SDP identified the following projects for the 2006/11 timeframe:

20          **(a) New East Osoyoos Substation**

21          Construction of a distribution source substation in East Osoyoos (Nk'Mip) in 2006.

22          **2007 UPDATE:** *This project was approved by Commission Order C-1-06 and is*  
23          *currently scheduled for completion in the 2006/07 timeframe.*

24          **2009 UPDATE:** Complete.



1           **(b) Rebuild Oliver as Distribution Source Substation**

2           Conversion of the existing Oliver Terminal station to accommodate a distribution  
3           source substation in the 2007/08 timeframe.

4           ***2007 UPDATE:** This project schedule is dependent on the timing of the Bentley  
5           Terminal station. It will be addressed as part of the OTR Project and covered in the  
6           application for the CPCN that will be filed in 2007. The project is now tentatively  
7           scheduled for the 2009/10 timeframe.*

8           **2009 UPDATE:** A CPCN application for the OTR Project was filed with the  
9           Commission on December 14, 2007. An oral hearing is scheduled for June 23, 2008.

10       **2.1.2.4 Princeton - Keremeos**

11           The 2005 SDP forecast modest load growth in the Princeton-Keremeos area. However,  
12           during the winter of 2005, the peak load on Transformer 3 at Princeton Substation  
13           exceeded the nameplate rating. This necessitated the replacement of the transformer.

14           **(a) Princeton Reconfiguration and Transformer Replacement**

15           Installation of two 138/25/13 kV transformers to supply both Princeton and FortisBC  
16           distribution loads.

17           ***2007 UPDATE:** The installation of one transformer was approved in Commission  
18           Order G-8-06 and will be completed in 2006. The second transformer has been  
19           deferred to the 2012+ timeframe.*

20           **2009 UPDATE:** The installation of one transformer is complete. The installation of  
21           the second transformer continues to be deferred to the 2012+ timeframe.

22           **(b) NEW - 2007 - Hedley Substation Step-up Transformer.** Load growth at the  
23           Hedley Substation has exceeded the capacity of the step-up transformer requiring its  
24           replacement in 2007.

1           **2009 UPDATE:** Complete.

### 2   **2.1.3 Kootenay Region**

3   The Kootenay region consists of the following areas: Castlegar, Crawford Bay, Creston-  
4   Wynndel, Grand Forks-Boundary, Kaslo-Coffee Creek, South Slokan, and Trail-Salmo.

#### 5   **2.1.3.1 Castlegar:**

6           The 2005 SDP forecast modest load growth for this area. However, cumulative growth  
7           over time has resulted in the need for the following project:

##### 8           **(a) Castlegar Capacity Upgrade**

9           Installation of a new 63/13 kV transformer and associated protection in 2006.

10           **2007 UPDATE:** *The preliminary engineering assessment indicates that the existing*  
11           *substation is inadequate to accommodate the new transformer; consequently, the*  
12           *capacity upgrade will require the construction of an additional substation near the*  
13           *load centre to offload a portion of the Castlegar load. As an interim measure a portion*  
14           *of the load has been temporarily transferred to the Blueberry Substation. This project*  
15           *has now been deferred to 2008.*

16           **2009 UPDATE:** This project which has been renamed “Ootischenia Substation”  
17           received CPCN approval by Commission Order C-10-07 and is scheduled to be  
18           complete in 2009.

19           **(b) NEW - 2009 - Tarrys Substation upgrade:** This project, scheduled for 2009,  
20           involves the installation of fans to increase the capacity of the Tarrys transformer and  
21           the addition of regulators to provide backup from the Passmore substation in case of  
22           transformer failure. Tarrys is a single transformer substation that feeds the Kalesnikoff  
23           Lumber Mill. The transformer has a nameplate capacity of 2.5 MVA with fans and 2  
24           MVA without fans. Currently there are no fans installed. The peak load for this station  
25           last year was 2.9 MVA

### 2.1.3.2 Crawford Bay:

The Crawford Bay load has grown to a point where the peak load exceeds the nameplate rating of the two 13 kV distribution transformers. In addition, failure of one of the two existing transformers at peak will result in load shedding. The 2005 SDP identified the following project for this area:

#### (a) Crawford Bay Capacity Increase and Grounding Bank

Installation of a new 63/13 kV distribution transformer and associated protection to serve the Crawford Bay area in 2006.

*2007 UPDATE: The installation of the distribution transformer has been scheduled for 2007.*

**2009 UPDATE:** The installation of the distribution transformer has been completed. The installation of the grounding bank has been cancelled as a result of the 30 Line conversion project scheduled for 2009.

### 2.1.3.3 Creston - Wynndel:

The Creston area is served from the BC Hydro 230 kV system via a single 230/63 kV transformer at Lambert Terminal station. Failure of the existing 230/63 kV transformer would result in significant customer outages in the Creston area. In addition, outages to the 230 kV BC Hydro transmission line 2L294 result in loss of service to all of the Creston area customers. The 2005 SDP proposed the following projects to address this issue:

1           **(a) 230 kV Ring Bus and New Transformer at Lambert Terminal**

2           Installation of a second 230/63 kV transformer at Lambert Terminal station and re-  
3           arrangement of the station to form a ring bus configuration in the 2006 timeframe.

4           **2007 UPDATE:** *The project to install the second transformer was approved in*  
5           *Commission Order G-8-06. The engineering for the transformer addition is scheduled*  
6           *for 2006 with construction scheduled for 2007.*

7           *A reliability analysis will be carried out for the ring bus portion of the Lambert project.*  
8           *However, this portion of the project, which involves a joint effort between FortisBC*  
9           *and BC Hydro, has been rescheduled for the 2012+ timeframe.*

10          **2009 UPDATE:** The second transformer has been installed. The status with respect to  
11          the ring bus project has not changed.

12          **2.1.3.4 Grand Forks - Boundary:**

13          This area is served by a network of two 63 kV transmission lines (9 Line and 10 Line)  
14          and eight distribution source substations. The lines and stations are at or near the end  
15          of their expected service lives. The 2005 SDP identified that the electrical system in  
16          this area is in need of a major upgrade and proposed the following projects for the  
17          2006/10 timeframe:

18          **(a) New Kettle Valley 161/25 kV Distribution Source Substation**

19          Construction of a distribution source substation in the Kettle Valley area, salvage the  
20          five existing 63 kV source substations between Grand Forks and Oliver Terminal  
21          Station and convert the distribution to 25 kV in the 2006/08 timeframe.

22          **2007 UPDATE:** *The priority and schedule for this project are unchanged. As directed*  
23          *by the Commission Order G-52-05 and Decision dated May 31, 2005, FortisBC*  
24          *submitted an application for a CPCN for this project in October 2005.*

1           **2009 UPDATE:** This project has received CPCN approval by Commission Order C-6-  
2           06 and is scheduled to be complete in 2008. The Rock Creek load has already been  
3           transferred to the new substation. Salvage of plant will occur in 2009.

4           **(b) New Grand Forks 161/25 kV Distribution Source Substation**

5           Construction, in the 2009/10 timeframe, of a distribution source substation at Grand  
6           Forks, salvage of the three existing 63 kV source substations between the Grand Forks  
7           Terminal and the Mawdsley Terminal stations and conversion of the distribution to 25  
8           kV.

9           **2007 UPDATE:** *Further assessment of this project indicated that due to load changes,*  
10          *it is necessary to maintain 63 kV (9 Line and 10 Line) between Grand Forks Terminal*  
11          *station and an industrial customer on the east side of Grand Forks. The schedule for*  
12          *this project has been changed to the 2010/11 timeframe.*

13          **2009 UPDATE:** A further assessment of this project has deferred implementation to  
14          2011+ timeframe.

15          **2.1.3.5 Kaslo - Coffee Creek:**

16          Modest growth is expected for this area over the forecast period; however, by the  
17          winter of 2006/07 the Coffee Creek Terminal station is projected to exceed the  
18          maximum capacity of the existing 8.4 MVA transformer. As well, it has been  
19          determined that with the installation of capacitors at the Coffee Creek Terminal Station  
20          and the Kaslo Substation, these two locations could be served via 32 Line from the  
21          Lambert Terminal station in the event of an outage on 30 Line from the South Slocan  
22          Terminal Station. The 2005 SDP identified the following projects for this area:

23          **(a) Coffee Creek Capacitors**

24          Installation of capacitors at the Coffee Creek Terminal station in 2006.

25          **2007 UPDATE:** *This project is currently scheduled for 2007.*

1           **2009 UPDATE:** This project has been rescheduled to 2009 in conjunction with the 30  
2           Line conversion project.

3           **(b) Kaslo Capacitor**

4           Installation of capacitors at the Kaslo Substation in 2006.

5           *2007 UPDATE: This project is currently scheduled for 2007.*

6           **2009 UPDATE:** This project has been rescheduled to the 2009 in conjunction with the  
7           30 Line conversion project.

8           **(c) Coffee Creek Transformer 3**

9           Replacement of Transformer 3 at the Coffee Creek Terminal station in the 2008  
10           timeframe.

11           *2007 UPDATE: As a result of modest load growth, this project has been rescheduled*  
12           *to 2009.*

13           **2009 UPDATE:** As a result of continued modest load growth, this project has been  
14           rescheduled to the 2011+ timeframe.

15           **(d) NEW - 2007 - Convert 30 Line from 161 kV to 63 kV:** The installation of a  
16           second 230/63 kV transformer at Lambert Terminal station in 2006/07 will secure the  
17           power supply to Creston and reduce the need of 32 Line as a backup between Crawford  
18           Bay and Creston. Further, the decommissioning by Teck Cominco of 30 Line between  
19           Crawford Bay and Kimberley, traditionally considered a backup for loads at Crawford  
20           Bay, Coffee Creek and Kaslo, will make it possible to operate 30 Line between South  
21           Slocan and Crawford Bay at 63 kV. It will be a radial supply with a similar level of  
22           reliability for FortisBC customers in other areas. With modest load growth, adequate  
23           voltage can be maintained by providing reactive compensation as required in the future.  
24           This project cancels the requirement for the transformer replacement project at Coffee

1 Creek and Crawford Bay (T3), listed in Section 2.2.2 (f) and 2.2.2 (g). This project is  
2 currently scheduled for 2009.

3 **2009 UPDATE:** No Change.

#### 4 **2.1.3.6 South Slocan:**

5 Modest load growth is expected for this area over the forecast period. The 2005 SDP  
6 identified the following project in the 2011+ timeframe to improve reliability in the  
7 area:

##### 8 **(a) Slocan City to New Denver (BC Hydro)**

9 Construction of a 63 kV transmission line from South Slocan to New Denver in the  
10 2011+ timeframe.

11 ***2007 UPDATE:** This project has been rescheduled for the 2012+ timeframe.*

12 **2009 UPDATE:** This project has been deferred indefinitely due to the high cost.

#### 13 **2.1.3.7 Trail-Salmo:**

14 Modest load growth is expected for this area over the forecast period. The 2005 SDP  
15 identified the following project for this area:

##### 16 **(a) Ymir Transformer Replacement (Cottonwood Substation)**

17 ***2007 UPDATE:** This project was approved by Commission Order G-8-06 and will be  
18 completed in 2006. This project has not changed.*

19 **2009 UPDATE:** The new Cottonwood substation has been completed and has  
20 replaced the legacy Whitewater substation. The future conversion of the area  
21 distribution system to 25 kV and retirement of the Ymir substation is scheduled for the  
22 2011+ timeframe as per item c below.

1           **(b) 18 Line Breaker at Waneta**

2           Installation of a new circuit breaker on 18 Line at Waneta in 2006 to accommodate  
3           increased fault levels.

4           **2007 UPDATE:** *This project is rescheduled to 2008. It is driven by Teck Cominco's*  
5           *schedule to rebuild the Waneta Substation.*

6           **2009 UPDATE:** Complete.

7           **(c) NEW - 2007 - Convert Ymir Feeder 1 to 25 kV:** This project is scheduled for  
8           the 2011+ timeframe.

9           **2009 UPDATE:** No change.

10   **2.2 Transmission and Stations (Sustaining)**

11   FortisBC has 58 transmission lines and 68 terminal and substations. The transmission system  
12   consists of approximately 1,600 kilometres of line and approximately 16,000 poles. Close to 65  
13   percent of these lines are more than 30 years old. The terminals and substations consist of  
14   approximately 110 transformers, 350 circuit breakers, 950 fused switches and disconnects. The  
15   average age of the transformers and many other devices exceed 30 years.

16   Like most North American utilities, FortisBC must address the issue of aging infrastructure. As  
17   the infrastructure ages, the power system becomes less safe, less reliable and more costly to  
18   operate and maintain. The Company therefore continues to focus on the replacement of  
19   deteriorated, defective or obsolete electrical equipment.

20   The 2005 SDP gave an assessment of the condition of the Company's transmission and  
21   substation infrastructure and provided an overview of the inspection and maintenance procedures  
22   currently utilized to identify the sustaining capital projects that are required for rehabilitation and  
23   ongoing upgrades of the system. These projects are required to ensure safe, reliable service.  
24   Appendix 3 shows the original schedule and estimate as well as the current schedule and  
25   estimate for the transmission and stations sustaining projects identified in the 2005 SDP.



1 **2.2.1 Transmission**

2 The 2005 SDP identified the following specific sustaining capital projects for transmission:

3 **(a) Rehabilitation of 32 Line Crawford Bay-Creston in 2005**

4 *2007 UPDATE: This project has been completed.*

5 **(b) Rehabilitation of 20 Line, 21-24 Line, 51-51A Line, 53 Line, and 74 Line in**  
6 **2006**

7 *2007 UPDATE: This project has been completed.*

8 **(c) Rehabilitation of 6A Line in 2008**

9 *2007 UPDATE: This project is now included in a general project called the Future*  
10 *Year Rehabilitation and Condition Assessment Project for 2009 and beyond.*

11 **(d) Rehabilitation of 26 Line in 2008**

12 *2007 UPDATE: This project is now included in a general project called the Future*  
13 *Year Rehabilitation and Condition Assessment Project for 2009 and beyond.*

14 **(e) Rehabilitation of 27 Line in 2009**

15 *2007 UPDATE: This project is now included in a general project called the Future*  
16 *Year Rehabilitation and Condition Assessment Project for 2009 and beyond.*

17 **2009 UPDATE:** The assessment of the 27 Line in 2007 indicates that a major rebuild  
18 of this Line is required in the 2009/2010 timeframe; consequently it is shown as a  
19 separate project in the 2009 Capital Plan.

20 **(f) Rehabilitation of 28 Line in 2009**

21 *2007 UPDATE: This project is now included in a general project called the Future*  
22 *Year Rehabilitation and Condition Assessment Project for 2009 and beyond.*

1           **(g) Transmission Switch Replacements and Additions**

2           **2009 UPDATE:** Transmission switch upgrades will take place at Castlegar substation  
3           in 2010.

4           **(h) NEW - 2009 - Rebuild 20 Line in 2009/10:** The 2007/08 condition assessment of  
5           this line indicates that a major rebuild of this line is necessary.

6           **(i) NEW - 2009 - Rehabilitation of 30 Line Lake-crossing in 2010:** The 2006/07  
7           condition assessment of this line indicates that a major rehabilitation of the lake-  
8           crossing is necessary.

9           **(j) NEW - 2009 - Pine Beetle Hazard Allocation:** Recent consecutive mild winters  
10          have accelerated the Mountain Pine Beetle (MPB) infestation within the FortisBC  
11          service area. Provincial infestation concentration maps for 2001 and 2006 show that  
12          MPB infestation has spread from the north central region of the province into the  
13          southern reaches of the province. Concentrations of MPB infestation are now clearly  
14          evident in the FortisBC service territory and are certain to increase in severity. This  
15          project is required to remove hazard trees killed by the MPB.

16          **(k) NEW - 2009 - Transformer Protection Upgrades:** In 2010 a program will be  
17          initiated to upgrade protection to transformers equipped with high side fuses or faulting  
18          switches to comply with current FortisBC standards. For legacy transformers with a  
19          capacity of 10 MVA or greater that are not in compliance with standards the protection  
20          will be removed and replaced with switches or breakers. The Joe Rich transformer  
21          protection will be upgraded in 2010.

22          **(l) NEW - 2009 - Creston Substation Protection Upgrade:** This project, scheduled  
23          for 2009 consists of an upgrade of the fusing/protection at Creston Central substation,  
24          so that it will coordinate with the Lambert 63 kV protection scheme and eliminate  
25          nuisance trips to the Creston Central substation customers. In addition, the project will  
26          upgrade the bus configuration to improve the switching and isolation capabilities in the  
27          station.

1   **2.2.2 Stations**

2   The 2005 SDP identified the following specific sustaining projects for stations:

3           **(a) West Osoyoos Transformer Rehabilitation**

4           Upgrading or replacement of the West Osoyoos transformer in 2006.

5           ***2007 UPDATE:** This project was approved by Commission Order G-8-06 and will be*  
6           *completed in 2007.*

7           **2009 UPDATE:** Complete.

8           **(b) Kaslo Substation Rehabilitation**

9           Upgrading the Kaslo Substation in 2006 and 2007.

10           ***2007 UPDATE:** An analysis of this substation has indicated that the project can be*  
11           *deferred to 2010.*

12           **2009 UPDATE:** Small upgrades completed under the condition and minor projects  
13           group has allowed this project to be deferred to 2011+.

14           **(c) Rebuild Pine Street Transformer**

15           Rehabilitation of Pine Street Transformer 1 in 2006 and 2007.

16           ***2007 UPDATE:** This project was approved as a transformer replacement by*  
17           *Commission Order G-8-06 and will be completed in 2006.*

18           **2009 UPDATE:** Complete

1           **(d) Westminster Transformer 1 Replacement in 2006**

2           *2007 UPDATE: This project was approved as a transformer rehabilitation in*  
3           *Commission Order G-8-06 and will be completed in 2006. This project has not*  
4           *changed.*

5           **2009 UPDATE:** Complete

6           **(e) Trout Creek Transformer 1 Rehabilitation in 2009/10**

7           *2007 UPDATE: This transformer continues to show signs of deterioration and is*  
8           *scheduled to be replaced with the transformer previously in use at the Waterford*  
9           *Substation, in 2007.*

10          **2009 UPDATE:** During the detailed design for this project, it was discovered that the  
11          ex-Waterford Transformer was physically incompatible with the existing bus  
12          connection arrangement at the Trout Creek Substation. The costs to engineer and  
13          install the required bus transition would have significantly exceeded the budgeted  
14          amount for the project. Additionally, FortisBC's planning group also identified the  
15          need for a more detailed analysis of the entire Westbench and Summerland distribution  
16          system to determine future substation requirements. This will be undertaken as part of  
17          the 2011 System Development Plan (2011 SDP). The outcome could result in the  
18          reduction of the number of substations in the area. In light of this, it has been decided  
19          to defer the installation of the transformer until the 2011 SDP is complete. As a result  
20          of the deferral, the Company has developed a contingency plan to address the possible  
21          failure of the Trout Creek Transformer.

22          **(f) Replacement of Coffee Creek Transformer 2 Capacity Addition in 2009/10**

23          *2007 UPDATE: Cancelled - The conversion of 30 Line from 161 kV to 63 kV removes*  
24          *the requirement for this transformer replacement.*

1           **(g) Replacement of Crawford Bay Transformer 1 in 2009/10**

2           **2007 UPDATE:** *Cancelled - The conversion of 30 Line from 161 kV to 63 kV removes*  
3           *the requirement for this transformer replacement.*

4           **(h) Bulk Oil Breaker Replacement**

5           **2009 UPDATE:** Breaker replacement on the 12 MVA Kootenay Mobile substation  
6           will take place in 2010. The two breaker replacement at DG Bell scheduled for 2009  
7           have been rescheduled to 2011.

8           **(i) Ground Grid Upgrades**

9           **2009 UPDATE:** Ground grid upgrades have been scheduled for the Castlegar  
10           substation in 2009.

11           **(j) NEW - 2009 - Slocan City - Valhalla Substation Upgrade:** This project  
12           scheduled for 2009 involves the transfer of the Slocan City substation load to the  
13           Valhalla substation and the salvage of the Slocan City substation transformer. The  
14           transformer at Slocan City is a legacy transformer and needs major attention since it is  
15           seeping oil in several locations. Maintenance test records indicate that it is nearing the  
16           end of its useful life. The Valhalla substation which was built in 2002, has adequate  
17           space for another transformer and is located only one kilometer away from the Slocan  
18           City substation.

19           **(k) NEW - 2009 - Passmore Substation Upgrade:** The project scheduled for 2010  
20           involves the expansion of the Passmore substation to accommodate the addition of a  
21           circuit breaker on 19 Line as well as space for a mobile substation in case of an  
22           emergency. The 63 kV transmission line (19 Line) radially serves the Passmore  
23           substation and supplies two other substations in the Slocan Valley. The transmission  
24           line north of the Passmore substation follows the highway in a very tight corridor and  
25           has a high outage rate. With the current configuration of the line, an unplanned outage  
26           anywhere on the line will cause the entire line to trip off as the only line protection is  
27           located at the source (South Slocan Generating station). This can cause unnecessary

1 outages to the Passmore Substation customers. The breaker addition on the north side  
2 of the Passmore station will prevent the majority of transmission outages to the north of  
3 the station from affecting the Passmore customers, and further improve reliability by  
4 improving restoration switching.

5 **(l) NEW - 2009 - Pine Street Substation Distribution Breaker Replacement:**

6 This project scheduled for 2009 involves the replacement of circuit breakers at the  
7 substation. The breakers were installed in 1967 and are at the end of their life. Parts  
8 for the units are no longer available; consequently failed or deteriorated parts must be  
9 replaced by parts produced by custom machining. Safety hazards associated with  
10 operating the equipment, require that it be replaced

11 **(m) NEW - 2009 - Princeton Substation Distribution Recloser replacement in**

12 **2010:** In 2010 circuit breakers will be installed at the Princeton Substation to replace  
13 the existing reclosers. As a result of capacity addition at the substation, the existing  
14 reclosers are no longer adequate to interrupt the available fault current that is possible  
15 at the substation.

16 **2.3 Distribution (Growth)**

17 This section outlines the projects identified by the 2005 SDP as growth projects and gives a brief  
18 update of the current status. Appendix 3 shows the original schedule and estimate as well as the  
19 current schedule and estimate for these projects.

20 **2.3.1 New Connects - System Wide**

21 This project includes installation of new services requiring additions to FortisBC overhead and  
22 underground facilities in all regions of its service territory. These capital expenditures allow  
23 FortisBC to meet its obligation to serve. The number of customers connected directly affects  
24 increases or decreases to this account.

25 **2007 UPDATE:** *This project is unchanged.*

26 **2009 UPDATE:** This project is unchanged.

### 2.3.2 Small Capacity Improvements and Unplanned Growth Projects

On an annual basis, the distribution feeder network is evaluated for voltage, thermal and backup capabilities based on forecast load growth. Where standards of service are not met, an appropriate solution involving regulators, capacitors, or other equipment is identified. Experience has shown that unforeseen load emergencies will require capacity upgrades and voltage correction projects not accounted for in the capital plan. This project provides the funding for such requirements.

**2007 UPDATE:** *This project is unchanged.*

**2009 UPDATE:** There is only one small Capacity Improvement (<\$250,000) planned for 2009 or 2010. It involves the installation of a regulator on Oliver Feeder 1.

### 2.3.3 Okanagan Region

The Okanagan region consists of the following areas: Kelowna, Penticton-Summerland, Oliver-Osoyoos and Princeton-Keremeos.

#### 2.3.3.1 The 2005 SDP identified the following growth-related projects in this area:

##### (a) DG Bell Feeder 2 to OK Mission Feeder 3 Tie

Construction of a feeder tie between DG Bell Feeder 2 and OK Mission Feeder 3 to provide interim load relief for the south west Kelowna area in 2006.

**2007 UPDATE:** *This project was approved by Commission Order G-8-06 and will be completed in 2006. This project is unchanged.*

**2009 UPDATE:** Complete.

##### (b) McKinley Landing Capacity Upgrade

1 Upgrading of a section of Sexsmith Feeder 3 from No. 2 conductor to No. 477  
2 conductor to accommodate load growth in the McKinley Landing area in the 2007  
3 timeframe.

4 **2007 UPDATE:** *This project has been rescheduled to 2008 to help mitigate Capital*  
5 *Plan expenditures.*

6 **2009 UPDATE:** This project is scheduled to be completed in 2008.

7 **(c) Hollywood Feeder 1 to FA Lee Feeder 2 Tie**

8 Construction of a feeder tie between Hollywood Feeder 1 and FA Lee Feeder 2 to  
9 provide interim load relief in the Gallagher area in the 2007 timeframe.

10 **2007 UPDATE:** *This project is has been rescheduled to 2009 to help mitigate Capital*  
11 *Plan expenditures.*

12 **2009 UPDATE:** This project has been included in the Black Mountain substation  
13 project and is scheduled to be completed in 2009.

14 **(d) New Glenmore Feeder 6**

15 Construction of a new feeder (Feeder 6) from the Glenmore Substation to  
16 accommodate load growth in the Magic Estates, Clifton and Glenmore Highlands  
17 development areas in the 2008 timeframe.

18 **2007 UPDATE:** *As a result of increasing load growth in this area, this project has*  
19 *been rescheduled to 2007.*

20 **2009 UPDATE:** Complete.

21 **(e) Hollywood Feeder 1 to OK Mission Feeder 1**

22 Upgrading of a section of line between Hollywood Feeder 1 and OK Mission Feeder 1  
23 along KLO Road to accommodate load transfer from the Hollywood Substation to the  
24 OK Mission Substation or the Bell Terminal station in the 2008 timeframe.



1           **2007 UPDATE:** *This project is unchanged.*

2           **2009 UPDATE:** This project is scheduled for completion in 2008.

3           **(f) McKinley to Clifton Tie**

4           Construction of a feeder tie between Glenmore Feeder 6 and Sexsmith Feeder 3 to  
5           accommodate load transfer in the Clifton, McKinley Landing area in the 2008  
6           timeframe.

7           **2007 UPDATE:** *This project has been rescheduled to 2010.*

8           **2009 UPDATE:** This project has been deferred to the 2011+ time frame due to modest  
9           growth in this area.

10          **(g) FA Lee Feeder 2 to Hollywood Feeder 5 Tie**

11          Construction of a feeder tie between Hollywood Feeder 5 and FA Lee Feeder 2 to  
12          accommodate load transfer in the Rutland and Black Mountain area in the 2008  
13          timeframe.

14          **2007 UPDATE:** *This project is unchanged.*

15          **2009 UPDATE:** This project is scheduled to be completed in 2008.

16          **(h) Ellison Substation - New Feeder**

17          Construction of a new feeder at the Ellison Substation to offload the 13 kV tertiary on  
18          the 230/138 kV system transformers at the FA Lee Terminal station in order to reduce  
19          the system risk associated with distribution faults. The 2005 SDP scheduled this  
20          project for the 2008 timeframe.

21          **2007 UPDATE:** *The project need is unchanged. The project description and cost has  
22          been included in the proposed Ellison project. An application for a CPCN will filed for  
23          this project in the third quarter of 2006.*

1           **2009 UPDATE:** This project is scheduled to be completed in 2009.

2           **(i) Future Kelowna Distribution Upgrades**

3           Upgrade feeders in the Kelowna area to accommodate load growth in the 2009/11  
4           timeframe.

5           **2007 UPDATE:** *This project is unchanged.*

6           **2009 UPDATE:** No Change

7           **(j) NEW - 2007 - Feeder Egress Cable Upgrade:** The underground cables from the  
8           OK Mission and Hollywood substations to the distribution lines are inadequate for the  
9           forecast growth on OK Mission Feeder 1, OK Mission Feeder 4, Hollywood Feeder 1,  
10          Hollywood Feeder 3, Hollywood Feeder 4, and Hollywood Feeder 5. Additional cables  
11          will be installed in 2007.

12          **2009 UPDATE:** Cancelled. As noted in the budget update letter filed on Sept 28,  
13          2006, a further assessment of the cables indicated that the cable had adequate capacity.

14          **(k) NEW - 2007 - Glenmore and Hollywood Underground Cable Replacement:**  
15          Sections of cables at several road crossings are inadequate to accommodate forecast  
16          load. The cable installations are currently scheduled for Glenmore Feeder 1, Glenmore  
17          Feeder 2 and Hollywood Feeder 4 in the 2007/08 timeframe.

18          **2009 UPDATE:** Complete

19          **(l) NEW - 2007 - Hollywood Feeder 3 - Sexsmith Feeder 3 Tie:** Construct a  
20          feeder tie between Hollywood Feeder 3 and Sexsmith Feeder 3 to accommodate load  
21          transfer in the 2009 timeframe.

22          **2009 UPDATE:** The reference to Sexsmith Feeder 3 is in error, it should read  
23          Sexsmith Feeder 4. This project has been rescheduled for 2010.

1           **(m) NEW - 2007 - Hollywood Feeder 1 - Hollywood Feeder 2 Tie:** Construct a  
2 feeder tie between Hollywood Feeder 1 and Hollywood Feeder 2 to accommodate load  
3 transfer in the 2007 timeframe.

4           **2009 UPDATE:** Complete

5           **(n) NEW - 2007 - FA Lee Feeder 2 Regulator:** Install a voltage regulator on FA  
6 Lee Feeder 2, in the 2007 timeframe, to provide voltage within acceptable limits.

7           **2009 UPDATE:** Complete

8           **(o) NEW - 2007 - Sexsmith Feeder 4 Regulator:** Install a voltage regulator, in the  
9 2008 timeframe, on Sexsmith Feeder 4 to provide voltage within acceptable limits.

10          **2009 UPDATE:** Cancelled. An alternate solution involving the identification of  
11 alternate feed points to be used during emergencies cancelled the need for this project.

12          **(p) NEW - 2009 - New Glenmore Feeder:** This project is required in 2009 to  
13 accommodate the increased load associated with the construction of a commercial  
14 building which has an estimated load of 3 MVA, and a residential development of  
15 multi family apartments on Dickson Avenue which has an estimated load requirement  
16 of 1 MVA.

17          **(q) NEW - 2009 - Airport Way Upgrade:** This project is required in 2010 to  
18 upgrade an existing underground circuit along Airport Way to accommodate increased  
19 load associated with the airport expansion and the commercial growth in the area.

### 2.3.3.2 Osoyoos - Oliver:

The SDP identified the following growth-related project in this area:

#### (a) 25 kV Tie to Bridesville

Construction of a feeder tie from the new East Osoyoos substation (Nk'Mip) to the proposed Kettle Valley Substation to accommodate load growth in the Bridesville area.

The 2005 SDP scheduled this project for the 2009 timeframe.

*2007 UPDATE: This project has been rescheduled to the 2012+ timeframe since the anticipated load growth has not materialized in this area.*

**2009 UPDATE:** No Change

**(b) NEW - 2009 - Christina Lake Feeder 1 Capacity Upgrade:** The Christina Lake feeder (CHR1) is experiencing end of line voltages below the standard criteria of 115V (3phase) and 113V (single Phase) during peak periods of the year. This project scheduled for 2009/10 involves reconductoring about 5 kilometres of No. 6 copper conductor to ensure all customers are supplied with acceptable voltages at their utilization point.

### 2.3.3.3 Princeton - Keremeos:

The 2005 SDP identified the following growth related project in this area:

#### (a) Keremeos Feeder

Construction of Keremeos Feeder 3 to offload Keremeos Feeder 2 which will reach its thermal limits in the 2006 timeframe.

*2007 UPDATE: This project will be deferred to 2010. Winter peak levels in Keremeos over the last two years were substantially higher than historical levels and therefore indicated feeder limits would be exceeded by 2007. The current 2006 forecast has*

1           *moderated demand growth slightly resulting in adequate capacity until the winter peak*  
2           *of 2010.*

3           **2009 UPDATE:** Due to modest load growth, this project has been rescheduled for  
4           2011+.

5           **(b) NEW - 2007 - Keremeos Feeder 1 Capacity Upgrade:** Upgrade sections of  
6           Keremeos Feeder 1 in the 2007 timeframe to maintain customer voltage levels within  
7           acceptable limits.

8           **2009 UPDATE:** This project is scheduled to be completed in 2008

9           **(c) NEW - 2007 - Keremeos Feeder 2 Capacity Upgrade:** Upgrade sections of  
10          Keremeos Feeder 2 in the 2007 timeframe to maintain customer voltage levels within  
11          acceptable limits.

12          **2009 UPDATE:** Complete

13          **(d) NEW- 2007 - Princeton Feeder 4 Capacity Upgrade:** Upgrade sections of  
14          Princeton Feeder 4 in the 2007 and 2009 timeframe to maintain customer voltage levels  
15          within acceptable limits.

16          **2009 UPDATE:** Complete

#### 17    **2.3.3.4 Penticton – Okanagan Falls:**

18          **(a) NEW - 2007 - OK Feeder 3 Capacity Upgrade:** Upgrade sections of OK Falls  
19          Feeder 3 in the 2007/08 timeframe to maintain customer voltage levels within  
20          acceptable limits.

21          **2009 UPDATE:** Complete

## 1 **2.3.4 Kootenay Region**

2 The Kootenay Region consists of the following areas: Castlegar, Crawford Bay, Creston-  
3 Wynndel, Grand Forks-Boundary, Kaslo-Coffee Creek, South Slokan, and Trail-Salmo.

### 4 **2.3.4.1 Trail-Salmo:**

5 The 2005 SDP identified the following growth related project in this area:

#### 6 **(a) Paterson 25 kV feeder and Voltage Conversion**

7 Conversion of the Paterson feeder to 25 kV, transfer the feeder to the Cascade  
8 Substation and salvage of the Paterson Substation in 2006.

9 *2007 UPDATE: This project was approved by Commission Order G-8-06 and will be*  
10 *completed in 2006. This project is unchanged.*

11 **2009 UPDATE:** Complete

12 **(b) NEW - 2007 - Valhalla Feeder 1 Capacity Upgrade:** Upgrade sections of  
13 Valhalla Feeder 1 in the 2008 timeframe to maintain customer voltage levels within  
14 acceptable limits.

15 **2009 UPDATE:** This project is scheduled to be completed in 2008

16 **(c) NEW - 2009 - Upgrade Beaver Park Feeder 2** The Beaver Park and Fruitvale  
17 substations are currently at 80 percent and 93 percent capacity respectively. The tie  
18 between the two substations consists mainly of No. 4 and No. 6 legacy copper  
19 conductor. This project will upgrade the tie between Beaver Park 2 and Fruitvale 1, to  
20 allow for a transfer of load from the Fruitvale substation to the Beaver Park substation,  
21 and to address forecast capacity issues at the Fruitvale substation.

### 22 **2.3.4.2 South Slokan area:**

23 The 2005 SDP identified the following growth project for this area.

1           **(a) Playmor – Tarrys Feeder Upgrade**

2           Upgrade Playmor Feeder 1 between Playmor and Tarrys substations, and transfer  
3           Tarrys residential load to Playmor. This will offload Tarrys Substation which is loaded  
4           above the recommended continuous rating of the substation transformer. The 2005  
5           SDP scheduled this project for 2006.

6           **2007 UPDATE:** *This project was approved in Commission Order G-8-06 and will be*  
7           *completed in 2006. This project is unchanged.*

8           **2009 UPDATE:** Complete

9           **2.3.4.3 Creston Area:**

10          The 2005 SDP identified the following project for this area:

11          **(a) Creston Area Distribution Feeder Upgrades**

12          Upgrade the Creston area distribution by constructing distribution feeders at Lambert  
13          Terminal station and transferring load from Creston Substation and Wynndel  
14          Substation to the new Lambert distribution source in the 2005/06 timeframe.

15          **2007 UPDATE:** *This project was approved in Commission Order G-8-06 and will be*  
16          *completed in 2006.*

17          **2009 UPDATE:** Complete

18          **(b) NEW - 2007 - Crawford Bay Feeder 2 Capacity Upgrade:** Upgrade sections  
19          of Crawford Bay Feeder 2 in the 2007 timeframe to maintain customer voltage levels  
20          within acceptable limits.

21          **2009 UPDATE:** Complete

## 1 **2.4 Distribution (Sustaining)**

2 FortisBC's distribution network consists of approximately 5,000 kilometres of line, 77,000  
3 support structures and 31,000 oil filled distribution transformers. Distribution sustaining capital  
4 expenditures are required for the replacement of poles, crossarms, conductor and transformers  
5 that are deteriorated, defective or obsolete. The projects in this group primarily focus on  
6 maintaining reliability and safety. This classification also includes capital expenditures related  
7 to the relocation of plant at the request of third parties. A significant portion is recovered from  
8 the parties making the request.

9 Appendix 3 shows the schedule and estimate as contained in the 2005 SDP as well as the current  
10 schedule and estimate.

11 **(a) NEW - 2009 - Copper Conductor Replacement Program:** Copper conductor  
12 ranging in sizes from No. 8 gauge to No. 4 gauge as well as No. 90 kcmil was  
13 commonly used for distribution lines 40-50 years ago due to its excellent electrical  
14 characteristics. During the past number of years, the company has experienced a  
15 significant number of conductor failures associated with this particular conductor. An  
16 analysis of the issues has identified a requirement to replace a significant amount of  
17 this legacy conductor with present aluminium standard conductor to avoid safety risk to  
18 workers and the public. A CPCN application that describes this issue and the plan for  
19 mitigation will be filed concurrently with the 2009/10 Capital Plan.

## 20 **2.5 Telecommunications, SCADA and Protection**

21 FortisBC operates a telecommunications system to support protection, control and monitoring of  
22 the power system, as well as operations and business communications requirements.

23 Approximately 102 locations are presently or potentially served by the telecommunications  
24 system, including 49 distribution stations, 11 terminal stations, 4 generation stations, 12  
25 mountain-top radio repeaters and 6 office locations. The telecommunications system also  
26 connects to other utilities for the exchange of protection signals and operational voice and data  
27 communications.



1 A variety of telecommunications transport systems are used, depending on technical  
2 requirements, economics and system reliability requirements. These include power line carrier,  
3 fibre-optic cable, copper pairs, Telus leased lines, and radio (VHF, microwave, spread spectrum  
4 and packet radio). The primary purpose of the telecommunications system is to be an integral  
5 component of the protection relaying system, remedial action schemes (“RAS”), substation  
6 operations and control, and generation dispatch systems. It also provides a low-cost alternative  
7 to the public network for internal business data and some voice traffic.

### 8 **2.5.1 Telecommunications, SCADA and Protection (Growth)**

9 The 2005 SDP identified the following projects:

#### 10 **(a) Distribution Substation Automation, Metering and Communication**

11 The intent of this multi-year project is to extend the coverage of substation automation  
12 in the FortisBC system. This project broadens the integration and use of remote  
13 monitoring and control to distribution level substations, including automated load  
14 restoration to reduce outage durations, power quality monitoring of lines, transformers  
15 and feeders, fault recording and locating, and equipment condition monitoring. The  
16 project will provide common communications mechanisms for gathering, storage,  
17 access and analysis of the resulting data. Resulting benefits are improvements in  
18 system performance, productivity, safety and economics.

19 The 2005 SDP scheduled this project for the 2006/09 timeframe with anticipated  
20 further projects in the 2012/24 timeframe.

21 **2007 UPDATE:** *As directed by Commission Order G-52-05 and Decision, dated May*  
22 *31, 2005, FortisBC will submit an application for a CPCN for this project in 2006.*

23 **2009 UPDATE:** This project has received CPCN approval by Commission Order C-  
24 11-07 and is scheduled to be completed in 2011

**(b) Trail-Oliver High Capacity Communications Network**

A high capacity network will enable the transfer of data at high speeds and volumes in FortisBC's entire service territory (Kootenay and Okanagan). This is required for system protection purposes as well as for monitoring and controlling the system remotely. It will displace costs for east-to-west leased lines currently used for system control and operational communications. The project will be undertaken in segments, coincident with the decommissioning of 9 Line and 10 Line and the replacement of the distribution substations in the Grand Forks / Boundary area.

***2007 UPDATE:** As part the Kettle Valley project, the section of the communications backbone between Oliver and Kettle Valley will be required in 2007 to provide the operational and protection communications needed by this station. Justification for this work was contained in the application for the CPCN that was submitted for the Kettle Valley project in October 2005.*

**2009 UPDATE:** This project to install fibre between Oliver and Grand Forks has received CPCN approval as part of the Kettle Valley project and is scheduled for completion in 2008. The project to install fibre between Grand Forks and Trail will form part of the Grand Forks Conversion project which has been deferred to the 2011+ timeframe

**(c) Telecommunications Backbone Loop Close**

This project will complete the FortisBC telecommunications backbone system loop configuration as commonly used by most utilities, and as required by WECC standards. The 2005 SDP scheduled this project for the 2011/20 timeframe.

***2007 UPDATE:** This project has been rescheduled to the 2012/2025 timeframe.*

**2009 UPDATE:** This project will be updated as part of the 2011 Long Term System Development Plan.

1           **(d) Telecommunications for Business Systems**

2           This project provides for the use of the FortisBC telecommunications system for future  
3           applications that may be developed for company operations in the period 2010/25. In  
4           each case, use of the FortisBC telecommunications system will be dependent on its  
5           ability to improve the performance of the application, and lower the operating and  
6           maintenance costs for the telecom portion of the systems (displacing common carrier  
7           costs). The 2005 SDP scheduled this project for the 2011/25 timeframe.

8           **2007 UPDATE:** *This project has been rescheduled to the 2012/2025 timeframe.*

9           **2009 UPDATE:** This project will be updated as part of the 2011 Long Term System  
10          Development Plan.

11   **2.5.2 Telecommunications, SCADA and Protection (Sustaining)**

12          This is a multiyear project consisting of a number of items, necessary to maintain the integrity of  
13          the Company's telecommunication, SCADA and protection network in order to supply safe,  
14          reliable electrical service. It includes items such as harmonic remediation, protection upgrades,  
15          and fault locating for inaccessible lines and communication upgrades.

16          Appendix 3 shows the schedule and estimate as contained in the 2005 SDP as well as the current  
17          schedule and estimate.

**Appendix 1 Load Forecast**

- Substations are listed under the area in which they are physically located, although some feeders connected to certain substations may serve a small portion of load in an adjacent area.

*North Okanagan (Kelowna) (summer)*

North Okanagan					Summer Historical						Summer Projected Loading						
					2002/3	2003/4	2004/5	2005/6	2006/7	2007/8	2008/9 Year 0	2009/10 Year 1	2010/11 Year 2	2011/12 Year 3	2012/13 Year 4	2013/14 Year 5	2028/29 Year 20
Region	Sub No	Name	Trans		kVA	kVA	kVA	kVA	kVA	kVA	kVA	kVA	kVA	kVA	kVA	kVA	
NOK	W302S	Glenmore	T2	S	26168	23484	18799	16645	17155	16345	17392	17937	19112	20287	21462	21933	26231
NOK	W302S	Glenmore	T3	S	19800	22475	25172	28665	30638	30806	34175	34147	34965	35783	36601	37892	49884
NOK	W304S	Hollywood	T1	S	17712	18312	19536	17760	20047	20750	22089	23023	23744	24465	25186	26857	33577
NOK	W304S	Hollywood	T3	S	15432	17904	23736	23832	25972	27342	28179	29972	30756	30522	31281	32134	40175
NOK	W305S	Okanagan Mission	T1	S	19135	18488	20142	19527	23362	22407	23226	27603	28326	30662	31424	32533	43146
NOK	W305S	Okanagan Mission	T2	S	9540	12444	12949	12774	13574	13108	17080	17527	17975	18422	18870	19498	25293
NOK	W306S	Recreation	T1	S	20208	22200	22200	19560	21864	24681	28105	28895	29685	30475	31265	32652	46247
NOK	W308S	Sexsmith	T1	S	22488	25992	27696	25944	28704	28704	28836	22420	26137	29853	34200	36494	53633
NOK	W313S	Saucier	T1	S	20832	18168	18240	16824	18047	19944	18675	20416	23057	23448	23840	24316	28652
NOK	W315S	Joe Rich	T1	S			4702	5000	5339	4170	1671	1776	1881	1986	2091	2117	2351
NOK	W316S	Duck Lake	T1	S	4143	4496	4469	7744	9058	12631	13988	10508	11382	12255	13128	13565	17596
NOK	W371S	D.G. Bell	T1	S	11095	12188	13510	14203	17424	19774	15767	18872	20652	22433	24213	26000	47505
NOK	W372S	Lee	T tert	S	10808	12808	13129	11762	15072	14805	18420	6352	4057	5897	6354	0	0
NOK	W311S	Ellison	T1	S								15847	22493	25818	28242	29803	46771
NOK	W310S	Black Moutain	T1	S								16903	19828	22754	24825	28283	63141
NOK	W301S	Big White	T1	S							3299	8737	8774	8811	8849	8960	9948
<b>Sub-Total NOK</b>					197361	208959	224280	220241	246256	255467	270901	300935	322822	343872	361831	373037	534151

*South Okanagan – Similkameen (summer)*

South Okanagan/Similkameen					Summer Historical						Summer Projected Loading						
					2002/3	2003/4	2004/5	2005/6	2006/7	2007/8	2008/9 Year 0	2009/10 Year 1	2010/11 Year 2	2011/12 Year 3	2012/13 Year 4	2013/14 Year 5	2028/29 Year 20
Region	Sub No	Name	Trans		kVA	kVA	kVA	kVA	kVA	kVA	kVA	kVA	kVA	kVA	kVA	kVA	kVA
SOK	W320S	Huth	T7//T4-6	S	12144	12371	12371	10496	10496	11440	11594	11743	11892	12041	12190	12354	13820
SOK	W320S	Huth13kV(HUT1)	T8	S	13503	14213	13673	13775	18860	6690	12445	12699	12954	13208	13463	13645	15263
SOK	W321S	Kaleden(KAL1)	T1	S	3281	3441	2793	2738	3509	3727	3777	4075	4372	4669	4967	5034	5631
SOK	W322S	Naramata	T1	S	2938	3526	3526	3086	3527	4032	3923	4018	4113	4208	4304	4420	5526
SOK	W323S	Okanagan Falls	T1	S	10948	11643	11384	8639	11657	11400	12837	13175	13512	13850	14187	14570	18216
SOK	W324S	Summerland	T2	S	10222	11255	11330	11203	12849	12744	13092	13335	13578	13820	14063	14329	16636
SOK	W325S	Waterford	T1	S	8272	9088	8608	8752	13014	18373	18621	18797	18972	19148	19324	19585	21907
SOK	W326S	West Bench	T1	S	3358	5090	5293	5283	5455	18373	18621	18797	18972	19148	19324	19585	21907
SOK	W327S	Westminster	T1/T2	S	17024	17968	17056	16864	16992	17824	18148	18327	18506	18686	18865	19054	20534
SOK	W329S	Trout Creek	T1	S	6530	5714	5224	4949	5356	5326	5826	5925	6024	6123	6221	6319	7336
SOK	W333S	Pine Street(PIN2)	T1	S	7079	6838	5820	7771	7935	8045	8154	8261	8368	8475	8582	8698	9730
SOK	W333S	Pine Street	T2	S	9860	9747	10268	10404	10584	10104	11185	11334	11482	11631	11779	11938	13354
SOK	W338S	Osoyoos	T1	S	11639	12360	12554	12760	13662	13200	7428	8158	8889	9619	10349	10908	16994
SOK	W338S	Osoyoos(OSO3)	T2	S	4967	6623	7523	7234	7500	9130	9469	9807	10146	10484	10823	11310	11310
SOK	W345S	Keremeos	T1	S	9492	9694	9953	9857	10981	10691	11201	11395	11590	11785	11980	12195	17662
SOK	W347S	Hedley	T1	S	1542	1724	1414	1231	1703	2100	2128	2157	2186	2216	2247	2277	2547
SOK	W380S	Anderson	T3	S	13212	17124	14028	16368	22531	14244	18944	19148	19356	19568	19784	20051	22429
SOK	W386S	Oliver	T1	S	6141	6544	6616	6660	9158	6890	8155	8320	8489	8660	8833	9531	18183
SOK	W390S	Princeton	T3	S	11368	11621	11755	11755	12490	13000	13585	13726	13869	14015	14162	14800	19918
SOK		Nk'Mip	T	S							7598	8908	10289	11745	13279	13996	21805
SOK	138kV	BC Gas (Terasen)	T	S	2826	1630	86	60	0	0	350	350	350	350	350	350	350
SOK	138kV	Mascot	T	S	0	0	1623	0	0	0	0	0	0	0	0	0	0
<b>Sub-Total SOK</b>					166346	178214	172898	169885	198259	197333	217079	222454	227909	233448	239076	244948	301059

*Kootenay (summer)*

Kootenay					Summer Historical						Summer Projected Loading						
					2002/3	2003/4	2004/5	2005/6	2006/7	2007/8	2008/9 Year 0	2009/10 Year 1	2010/11 Year 2	2011/12 Year 3	2012/13 Year 4	2013/14 Year 5	2028/29 Year 20
Region	Sub No	Name	Trans		kVA	kVA	kVA	kVA	kVA	kVA	kVA	kVA	kVA	kVA	kVA	kVA	
KT	W102S	Kaslo	T1	S	6200	5257	5500	6133	5514	4860	5583	5660	5737	5814	5891	5968	7250
KT	W103S	Coffee Creek	T3	S	3853	2730	3140	4313	3643	4399	4439	4478	4518	4557	4597	4638	5258
KT	W110S	Crawford Bay	T2	S	1429	1820	1367	2062	2430	2466	2501	2535	2570	2604	2639	2676	3250
KT	W110S	Crawford Bay	T3	S	2024	2337	1738	3016	0	0	0	0	0	0	0	0	0
KT	W120S	Wynndel	T1	S	3085	2938	3036	2939	0	0	0	0	0	0	0	0	0
KT	W121S	Creston	T1	S	10000	10274	10307	7495	8164	7762	8072	8144	8216	8288	8360	8435	9563
KT	W121S	Creston	T2	S	6779	6514	6700	7313	8973	5301	6054	6108	6162	6216	6270	6326	7172
KT	W124S	Lambert	T1	S			1400	1442	8277	9021	9102	9183	9265	9346	9427	9512	10783
KT	W129S	Valhalla (VAL1)	T1	S	2300	3004	2508	2709	1730	1853	2018	2036	2054	2072	2090	2109	2391
KT	W130S	Passmore	T1	S	2160	1910	2351	2000	1763	2736	2774	2813	2851	2889	2928	2969	3606
KT	W131S	Playmor	T1	S	5267	7160	5733	5992	7312	8340	8457	8574	8690	8807	8924	9049	10993
KT	W132S	Slocan City (SLO1)	T1	S	4900	4117	3853	4025	3952	4057	4057	4057	4057	4057	4057	4057	4057
KT	W135S	Tarry's	T1	S	2400	2880	2880	2400	2609	2880	2880	2880	2880	2880	2880	2880	2880
KT	W200S	Whitewater (WHI1)	T1	S	115	112	112	73	78	0	0	0	0	0	0	0	0
KT	W201S	Cottonwood (COT1)	T1	S	0	0	0	0	0	116	116	117	118	119	120	121	137
KT	W202S	Salmo	T1	S	3456	3564	4104	4320	4896	4854	4940	4984	5028	5072	5116	5162	5852
KT	W204S	Hearns	T1	S	1119	192	178	133	133	1216	1225	1233	1242	1250	1259	1267	1397
KT	W205S	Fruitvale	T1	S	4224	4244	4244	3648	4042	5175	5222	5268	5315	5361	5408	5457	6186
KT	W206S	Ymir (YMR1)	T1	S	590	569	583	563	685	768	775	782	789	796	803	810	918
KT	W221S	Castlegar	T1	S	10702	11888	11888	9806	12481	12963	9291	9464	9638	9811	9984	10174	13241
KT	W222S	Blueberry	T1	S	4408	5289	5583	5437	6098	6542	6214	6330	6446	6561	6677	6804	8856
KT	W220S	Ootischenia	T1	S	0	0	0	0	0	0	5706	5813	5919	6026	6132	6249	8132
KT	W244S	Trail	T1	S	2800	2900	0	0	0	0	0	0	0	0	0	0	0
KT	W246S	Beaver Park	T1	S	6480	6408	6500	6500	7568	8174	8329	8485	8640	8795	8951	9121	11870
KT	W247S	Glenmerry	T1	S	8617	8799	8400	8500	8500	8619	8619	8738	8857	8976	9095	9222	11204
KT	W248S	Stoney Creek	T1	S	3594	3631	5838	3045	5320	5400	5476	5551	5627	5702	5778	5859	7118
KT	W256S	Paterson (PAT1)	T1	S	612	661	575	600	526	0	0	0	0	0	0	0	0
KT	W258S	Cascade	T1	S	6500	6792	4204	4799	4640	5200	5299	5398	5496	5595	5694	5802	7551
KT	63 kV	Celgar	T	S	16000	16000	16000	16000	16000	16000	16000	16000	16000	16000	16000	16000	16000
KT	63 kV	P&T - Castlegar	T	S	8022	7308	7644	7455	7539	7640	8022	8022	8022	8022	8022	8022	8022
KT	63 kV	City of Nelson	T	S		19620	17424	19459	10152	11230	15210	15420	15630	15840	16050	16275	19772
Sub-Total Kootenay Growth					127636	148918	143790	142177	143025	147572	156380	158072	159765	161458	163150	164963	193461

**Boundary (summer)**

Boundary					Summer Historical						Summer Projected Loading						
					2002/3	2003/4	2004/5	2005/6	2006/7	2007/8	2008/9 Year 0	2009/10 Year 1	2010/11 Year 2	2011/12 Year 3	2012/13 Year 4	2013/14 Year 5	2028/29 Year 20
Region	Sub No	Name	Trans		kVA	kVA	kVA	kVA	kVA	kVA	kVA	kVA	kVA	kVA	kVA	kVA	kVA
BND	W270S	Christina(CHR1)	T1	S	3709	3798	3515	3596	4077	4061	4179	4281	4383	4485	4587	4701	6643
BND	W271S	Ruckles	T1 -13 kV	S	8231	8492	9244	8791	7920	8074	8628	8787	8949	9113	9280	9419	11602
BND	W271S	Ruckles	T2	S	7966	7966	7986	8310	7650	8306	8451	8593	8734	8875	9016	9170	11610
BND	W275S	Grand Forks Termin	T3	S	1948	2911	2768	3591	4587	5056	5157	5258	5359	5460	5562	5673	7485
BND	W290S	Kettle Valley	T1	S	0	0	0	0	0	0	10542	10581	10621	10662	10703	10821	12612
BND	W290S	Kettle Valley	T2	S	0	0	0	0	0	0	0	0	0	0	0	0	0
BND	W291S	Midway	T1	S	4902	6302	6302	6050	5707	5815	0	0	0	0	0	0	0
BND	W292S	Rock Creek(ROC1)	T1	S	1729	1632	1507	1680	1680	1728	0	0	0	0	0	0	0
BND	W292S	Rock Creek(ROC2)	T2	S	928	989	846	1022	1102	1176	0	0	0	0	0	0	0
BND	W294S	Baldy(BAL1)	T1	S	184	152	152			0	0	0	0	0	0	0	0
BND	W296S	Greenwood	T1	S	1594	1428	1428	1457	1562	1648	0	0	0	0	0	0	0
BND	63 kV	Roxul	T	S	7403	8127	8001	8022	8135	8259	8259	8259	8259	8259	8259	8259	8259
Sub-Total Boundary Growth					38593	41797	41749	42518	42420	44123	45216	45759	46305	46854	47407	48043	58211

*North Okanagan (Kelowna) (winter)*

North Okanagan					Winter Historical						Winter Projected Loading						
					2002/3	2003/4	2004/5	2005/6	2006/7	2007/8	2008/9 Year 0	2009/10 Year 1	2010/11 Year 2	2011/12 Year 3	2012/13 Year 4	2013/14 Year 5	2028/29 Year 20
Region	Sub No	Name	Trans		kVA	kVA	kVA	kVA	kVA	kVA	kVA	kVA	kVA	kVA	kVA	kVA	
NOK	W302S	Glenmore	T2	W	16623	19792	13396	13404	14830	14485	17690	19043	20082	21120	22159	22646	27083
NOK	W302S	Glenmore	T3	W	22828	23860	27325	23079	31796	29166	33148	31153	31973	32792	33612	34798	45811
NOK	W304S	Hollywood	T1	W	23064	25224	24552	21792	24667	27900	27144	28905	29766	30627	31488	33326	41665
NOK	W304S	Hollywood	T3	W	15144	18120	22272	22056	23484	26470	28771	30353	31054	31755	32455	33341	41684
NOK	W305S	Okanagan Mission	T1	W	22342	22953	23296	22537	25927	25414	26300	30370	31189	33787	34651	35874	47576
NOK	W305S	Okanagan Mission	T2	W	12527	14958	15085	13339	17283	11874	19333	19892	20450	21008	21567	22284	28908
NOK	W306S	Recreation	T1	W	20280	23304	23136	21864	24528	25732	30354	31352	32351	33349	34348	35872	50807
NOK	W308S	Sexsmith	T1	W	24648	29520	29232	28464	20101	29145	33973	27500	31468	35435	40033	42598	62603
NOK	W313S	Saucier	T1	W	21024	22944	20808	20184	22944	20784	20639	22407	25075	25493	25911	26428	31141
NOK	W315S	Joe Rich	T1	W	13760	16067	15829	17849	16802	17820	2899	3117	3334	3552	3769	3817	4238
NOK	W316S	Duck Lake	T1	W	3716	4713	4929	8514	8960	9072	11944	8138	9012	9887	10761	11119	14424
NOK	W371S	D.G. Bell	T1	W	13337	16829	16780	17357	19774	19637	18565	21672	23416	25161	26905	28891	52786
NOK	W372S	Lee	T tert	W	15100	18912	17622	18712	20512	19129	23348	8373	5189	7124	7232	0	0
NOK	W311S	Ellison	T1	W					0	0	17415	24331	27782	30333	32009	50233	
NOK	W310S	Black Moutain	T1	W					0	0	20012	23310	26608	29050	32926	73507	
NOK	W301S	Big White	T1	W					0	14130	20705	21880	23055	24231	26651	59498	
Sub-Total NOK					224393	257196	254262	249151	271608	276628	308237	340408	363881	388535	408504	422579	631965

**Footnote:** Load forecasts are based on winter and/or summer peaks. Winter peaks span 2 years and include Nov. and Dec. of calendar year and Jan. and Feb. of the following year. i.e. 2003 data includes Jan. and Feb. 2004 data.



*South Okanagan - Similkameen (winter)*

South Okanagan/Similkameen					Winter Historical						Winter Projected Loading						
					2002/3	2003/4	2004/5	2005/6	2006/7	2007/8	2008/9 Year 0	2009/10 Year 1	2010/11 Year 2	2011/12 Year 3	2012/13 Year 4	2013/14 Year 5	2028/29 Year 20
Region	Sub No	Name	Trans		kVA	kVA	kVA	kVA	kVA	kVA	kVA	kVA	kVA	kVA	kVA	kVA	
SOK	W320S	Huth	T7//T4-6	W	11664	16051	16051	13136	13136	13488	15097	15298	15499	15700	15901	16116	18028
SOK	W320S	Huth13kV(HUT1)	T8	W	11221	13313	12621	12621	13714	6477	12157	12336	12516	12696	12876	13049	14597
SOK	W321S	Kaleden(KAL1)	T1	W	4706	4489	6317	4726	6481	6268	6568	6906	7243	7581	7918	8025	8977
SOK	W322S	Naramata	T1	W	5142	7200	6465	7347	6759	6048	7545	7744	7942	8140	8339	8564	10707
SOK	W323S	Okanagan Falls	T1	W	11600	13941	13419	13338	14600	14000	15107	14683	15054	15425	15796	16222	20282
SOK	W324S	Summerland	T2	W	12343	17647	15343	15266	16885	15744	17204	17538	17871	18205	18538	18889	21929
SOK	W325S	Waterford	T1	W	8144	11072	10496	8752	14980	17189	17421	17623	17826	18028	18230	18476	20667
SOK	W326S	West Bench	T1	W	6170	5942	7192	6802	7093	7454	8953	9188	9424	9659	9894	10161	12704
SOK	W327S	Westminster	T1/T2	W	17392	23872	21328	20064	22848	21088	24110	24349	24587	24825	25064	25314	27280
SOK	W329S	Trout Creek	T1	W	6122	7346	6556	6252	7033	6696	8004	8139	8274	8408	8543	8690	10089
SOK	W333S	Pine Street(PIN2)	T1	W	4619	5542	5755	5876	7559	6177	7661	7763	7865	7967	8069	8178	9148
SOK	W333S	Pine Street	T2	W	9168	11583	11090	10904	10980	11270	11380	11530	11681	11832	11983	12145	13585
SOK	W338S	Osoyoos	T1	W	8885	10841	10879	10721	10211	10960	5771	6229	6687	7144	7602	7924	10664
SOK	W338S	Osoyoos(OSO3)	T2	W	3600	6419	7050	6424	9261	8160	8368	8577	8785	8993	9202	9409	9409
SOK	W345S	Keremeos	T1	W	8387	11409	11390	10416	11862	11585	12490	14299	14548	14796	15045	15315	22181
SOK	W347S	Hedley	T1	W	3681	4905	4859	2709	4800	4640	4971	4988	5006	5023	5041	5109	5715
SOK	W380S	Anderson	T3	W	13320	14220	16332	20520	19971	14364	19066	19273	19482	19696	19914	20182	22576
SOK	W386S	Oliver	T1	W	5781	5277	7631	7336	10281	6170	10173	10380	10590	10804	11021	11894	22689
SOK	W390S	Princeton	T3	W	13895	18519	17388	16653	19700	17300	20587	20826	21069	21316	21568	22538	30334
SOK		Nk'Mip	T	W	0	0	0	0	0	0	5822	7036	8316	9666	11087	11686	18207
SOK	138kV	BC Gas (Terasen)	T	W	2347	2347	2347	105	0	0	500	500	500	500	500	500	500
SOK	138kV	Mascot	T	W	1623	1623	1623	0	0	0	0	0	0	0	0	0	0
<b>Sub-Total SOK</b>					169810	213558	212132	199969	228154	205078	238957	245206	250766	256406	262131	268388	330269

**Footnote:** Load forecasts are based on winter and/or summer peaks. Winter peaks span 2 years and include Nov. and Dec. of calendar year and Jan. and Feb. of the following year. i.e. 2003 data includes Jan. and Feb. 2004 data.

*Kootenay (winter)*

Kootenay					Winter Historical						Winter Projected Loading						
					2002/3	2003/4	2004/5	2005/6	2006/7	2007/8	2008/9 Year 0	2009/10 Year 1	2010/11 Year 2	2011/12 Year 3	2012/13 Year 4	2012/13 Year 5	2027/28 Year 20
Region	Sub No	Name	Trans		kVA	kVA	kVA	kVA	kVA	kVA	kVA	kVA	kVA	kVA	kVA	kVA	
KT	W102S	Kaslo	T1	W	9256	10620	9232	8702	9085	7395	8112	8224	8336	8448	8560	8672	10535
KT	W103S	Coffee Creek	T3	W	5997	7817	6853	5450	5040	5615	5666	5716	5767	5817	5868	5920	6712
KT	W110S	Crawford Bay	T2	W	1992	2312	2200	5488	5303	5337	5476	5551	5627	5702	5778	5859	7118
KT	W110S	Crawford Bay	T3	W	2657	3500	3300	0	0	0	0	0	0	0	0	0	0
KT	W120S	Wynndel	T1	W	4016	4114	3428	3552	0	0	0	0	0	0	0	0	0
KT	W121S	Creston	T1	W	13268	16116	14719	11850	11528	12880	12996	13112	13228	13344	13460	13581	15396
KT	W121S	Creston	T2	W	9953	12420	11371	11500	9346	9128	9333	9417	9500	9583	9666	9753	11057
KT	W124S	Lambert	T1	W			1800	3850	11589	12599	12712	12826	12939	13053	13166	13284	15060
KT	W129S	Valhalla (VAL1)	T1	W	2936	3925	3413	3278	3400	3610	3642	3675	3707	3740	3772	3806	4315
KT	W130S	Passmore	T1	W	2808	4100	3820	3549	3673	3528	3733	3767	3800	3833	3867	3901	4423
KT	W131S	Playmor	T1	W	8916	11610	12242	11398	12074	10455	11604	11707	11811	11914	12018	12126	13746
KT	W132S	Slocan City (SLO1)	T1	W	5635	4519	5186	4400	4260	4453	4453	4453	4453	4453	4453	4453	4453
KT	W135S	Tarry's	T1	W	2880	3360	3360	2880	2826	3152	3152	3152	3152	3152	3152	3152	3152
KT	W200S	Whitewater (WH1)	T1	W	365	345	323	350	337	0	0	0	0	0	0	0	0
KT	W201S	Cottonwood (COT1)	T1	W	0	0	0	0	0	357	357	363	370	377	383	391	508
KT	W202S	Salmo	T1	W	5616	6984	7056	6912	6371	6763	6962	7024	7086	7148	7211	7275	8248
KT	W204S	Hearns	T1	W	1367	263	160	200	1520	1576	1587	1598	1609	1620	1631	1643	1811
KT	W205S	Fruitvale	T1	W	5760	7445	6465	6432	6563	7409	7476	7542	7609	7676	7742	7812	8856
KT	W206S	Ymir (YMR1)	T1	W	972	1224	1187	1075	1102	960	1059	1069	1078	1088	1097	1107	1255
KT	W221S	Castlegar	T1	W	14733	17250	16644	17064	17700	16690	10700	10899	11099	11298	11498	11716	15248
KT	W222S	Blueberry	T1	W	7640	8375	7640	8330	7768	8543	7643	7785	7928	8070	8213	8369	10892
KT	W220S	Ootischenia	T1	W	0	0	0	0	0	0	7948	8096	8245	8393	8541	8703	11327
KT	W244S	Trail	T1	W	3000	2700	0	0	0	0	0	0	0	0	0	0	0
KT	W246S	Beaver Park	T1	W	6826	8263	7870	8082	8035	7556	7859	7967	8076	8184	8293	8409	10215
KT	W247S	Glenmerry	T1	W	8015	10559	10388	9977	9974	10254	10398	10541	10685	10828	10972	11125	13516
KT	W248S	Stoney Creek	T1	W	4805	6232	7367	6783	7315	7477	7582	7686	7791	7896	8000	8112	9856
KT	W256S	Paterson (PAT1)	T1	W	942	857	673	790	857	0	0	0	0	0	0	0	0
KT	W258S	Cascade	T1	W	7087	8000	8112	7336	8418	9300	9477	9653	9830	10007	10184	10377	13505
KT	63 kV	Celgar	T	W	16000	16000	16000	16000	16000	16000	16000	16000	16000	16000	16000	16000	16000
KT	63 kV	P&T - Castlegar	T	W	7949	7298	7560	7870	7770	7830	7949	7949	7949	7949	7949	7949	7949
KT	63 kV	City of Nelson	T	W	22680	24228	22140	24263	25517	21380	25874	26231	26589	26946	27303	27685	33634
<b>Sub-Total Kootenay</b>					184071	210436	200509	197361	203371	200246	209748	212005	214261	216518	218775	221181	258787
<b>Growth</b>																	

**Footnote:** Load forecasts are based on winter and/or summer peaks. Winter peaks span 2 years and include Nov. and Dec. of calendar year and Jan. and Feb. of the following year. i.e. 2003 data includes Jan. and Feb. 2004 data.

**Boundary (winter)**

Boundary					Winter Historical						Winter Projected Loading						
					2002/3	2003/4	2004/5	2005/6	2006/7	2007/8	2008/9 Year 0	2009/10 Year 1	2010/11 Year 2	2011/12 Year 3	2012/13 Year 4	2013/14 Year 5	2027/28 Year 20
Region	Sub No	Name	Trans		kVA	kVA	kVA	kVA	kVA	kVA	kVA	kVA	kVA	kVA	kVA	kVA	
BND	W270S	Christina(CHR1)	T1	W	4583	4437	4275	4116	4572	4277	4636	4700	4764	4828	4892	4961	6026
BND	W271S	Ruckles	T1 -13 kV	W	9209	11532	11278	10076	10289	10502	10649	10859	11073	11289	11509	11670	14178
BND	W271S	Ruckles	T2	W	7310	9775	9040	9815	8820	7820	8128	8256	8384	8512	8640	8778	10963
BND	W275S	Grand Forks Terminal(GFT1)	T3	W	3141	4384	4221	6392	6485	6827	6957	7086	7216	7346	7476	7618	9914
BND	W290S	Kettle Valley	T1	W	0	0	0	0	0	0	14932	14992	15052	15113	15175	15342	17881
BND	W290S	Kettle Valley	T2	W	0	0	0	0	0	0	0	0	0	0	0	0	0
BND	W291S	Midway	T1	W	6552	7100	7100	7227	7159	7159	0	0	0	0	0	0	0
BND	W292S	Rock Creek(ROC1)	T1	W	2024	1983	2468	2448	3840	2760	0	0	0	0	0	0	0
BND	W292S	Rock Creek(ROC2)	T2	W	1114	1243	1440	2253	1689	2160	0	0	0	0	0	0	0
BND	W294S	Baldy(BAL1)	T1	W	592	592	1299	0		0	0	0	0	0	0	0	0
BND	W296S	Greenwood	T1	W	2086	2160	2160	2411	2556	2534	0	0	0	0	0	0	0
BND	63 kV	Roxul	T	W	8148	8211	8190	8043	8227	8463	8463	8463	8463	8463	8463	8463	8463
Sub-Total Boundary Growth					44759	51417	51471	52781	53637	52502	53765	54357	54952	55551	56154	56831	67425

**Footnote:** Load forecasts are based on winter and/or summer peaks. Winter peaks span 2 years and include Nov. and Dec. of calendar year and Jan. and Feb. of the following year. i.e. 2003 data includes Jan. and Feb. 2004 data.

## Appendix 2 Project Schedule and Estimate

### Summary

CATEGORY	2009		2010	
	Update/07	Update/09	Update/07	Update/09
<b>TRANSMISSION</b>	58,083	96,123	41,174	88,675
Transmission Growth	51,907	84,396	33,458	76,178
Transmission Line Sustaining	3,439	7,024	3,864	7,109
Stations Sustaining	2,737	4,703	3,852	5,388
<b>DISTRIBUTION</b>	23,319	28,207	22,203	33,750
Distribution Growth	13,631	12,158	12,161	15,433
Distribution Sustaining	9,688	16,049	10,042	18,317
<b>TELECOM, SCADA, P&amp;C</b>	4,635	2,202	932	2,176
Telecom Growth	3,400	1,338	0	1,438
Telecom Sustaining	1,235	864	932	738
<b>TOTAL T&amp;D CAPITAL FORECAST</b>	<b>86,037</b>	<b>126,532</b>	<b>64,309</b>	<b>124,601</b>

## Transmission

TRANSMISSION PROJECT DESCRIPTION	Complete	2009 (\$000s)		2010 (\$000s)		Scheduled	Cancelled
	<2009	Update/07	Update/09	Update/07	Update/09	>2010	
<b>TRANSMISSION GROWTH</b>							
<b>BULK SYSTEM</b>							
DOUBLE CIRCUIT 230 kV VASEUX TO RG ANDERSON		20,000	28,512		23,519		
230/161/138 kV BENTLEY TERMINAL		15,000	16,241	3,934	13,703		
230 kV VASEUX TO BENTLEY		5,000	3,021		3,127		
KELOWNA SHUNTS & SVC				2,930		<b>x</b>	
VASEUX TRANSFORMER 3 (500/230 kV)			4,430		4,254		
CONVERT EXISTING OLIVER TO 138/63/13 kV DISTRIBUTION SOURCE STATION		500	3,590	4,216	3,582		
RG ANDERSON TERMINAL UPGRADE			5,995		5,506		
LEE TERMINAL AND BELL TERMINAL 138 kV UPGRADE			2,394		2,626		
63 kV and 138 kV CIRCUITS BENTLEY TO OLIVER			1,082		1,576		
<b>TOTAL OTR</b>		<b>40,500</b>	<b>65,265</b>	<b>11,080</b>	<b>57,893</b>		
<b>KELOWNA AREA</b>							
BIG WHITE 138 kV LINE AND SUBSTATION	<b>x</b>						
ELLISON DISTRIBUTION SOURCE			1,734				
ELLISON TRANSMISSION LOOP				3,489		<b>x</b>	
BLACK MOUNTAIN DISTRIBUTION SOURCE			4,517				
FAULT LEVEL REDUCTION				1,634			<b>x</b>
CLOSE 138 kV LOOPS KELOWNA						<b>x</b>	
RECREATION CAPACITY INCREASE			178	2,749	3,401		
HOLLYWOOD (BENVOULIN DISTRIBUTION SOURCE) CAPACITY INCREASE		6,307	2,930		13,554		
BRAELOCH (SW) DISTRIBUTION SOURCE				1,582		<b>x</b>	
OK MISSION CAPACITY INCREASE							<b>x</b>
NORTH KELOWNA TRANSFORMER ADDITION							
KELOWNA DISTRIBUTION CAPACITY REQUIREMENTS			518		517		
STATIC VAR COMPENSATOR KELOWNA					400		
DUCK LAKE REGULATOR BANK	<b>x</b>						
<b>PENTICTON/SUMMERLAND AREA</b>							
NARAMATA REHABILITATION			3,962				
HUTH REBUILD AS 63 kV RING BUS				6,333	413		
SUMMERLAND 63 kV BACKUP						<b>x</b>	
WEST BENCH SUBSTATION REGULATOR BANK	<b>x</b>						
<b>OSOYOOS/OLIVER AREA</b>							
NEW EAST OSOYOOS SOURCE	<b>x</b>						
<b>PRINCETON/KEREMEOS AREA</b>							
PRINCETON TRANSFORMER 1 REPLACEMENT	<b>x</b>						
PRINCETON TRANSFORMER 2 REPLACEMENT						<b>x</b>	
HEDLEY STEP UP 5 MVA TRANSFORMER	<b>x</b>						
KEREMEOS NEW FEEDER				263			
<b>BOUNDARY/GRAND FORKS AREA</b>							
KETTLE VALLEY DISTRIBUTION SOURCE	<b>x</b>						
KETTLE VALLEY VOLTAGE CONVERSION	<b>x</b>						
BOUNDARY AREA STATION CONVERSIONS	<b>x</b>						
GRAND FORKS AREA VOLTAGE CONVERSIONS				2,532		<b>x</b>	
GRAND FORKS DISTRIBUTION SOURCE				3,796		<b>x</b>	

**Transmission cont'd**

TRANSMISSION PROJECT DESCRIPTION	Complete	2009 (\$000s)		2010 (\$000s)		Scheduled	Cancelled
	<2009	Update/07	Update/09	Update/07	Update/09	>2010	
<b>CASTLEGAR AREA</b>							
TARRYS SUBSTATION UPGRADE			403				
CASTLEGAR CAPACITY INCREASE (OOTISCHENIA SUBSTATION)			389				
<b>COFFEE CREEK - KASLO AREA</b>							
COFFEE CREEK TRANSFORMER 3 REPLACEMENT		2,600				x	
30 LINE CONVERT TO 63 KV		2,500	4,500				
<b>CRAWFORD BAY AREA</b>							
CRAWFORD BAY CAPACITY INCREASE	x						
<b>CRESTON/WYNDELL AREA</b>							
LAMBERT SUBSTATION UPGRADE	x						
NEW LAMBERT 230/63 KV TRANSFORMER	x						
NEW LAMBERT 230 KV RING BUS						x	
<b>SOUTH SLOCAN AREA</b>							
SLOCAN - NEW DENVER 63 KV LOOP							x
<b>TRAIL/SALMO AREA</b>							
YMIR FEEDER CONVERSION	x						
NEW 18 LINE BREAKER AT WANETA	x						
<b>SUBTOTAL - TRANSMISSION GROWTH</b>		51,907	84,396	33,458	76,178		

**Transmission cont'd**

TRANSMISSION PROJECT DESCRIPTION	Complete	2009 (\$000s)		2010 (\$000s)		Scheduled	Cancelled
	<2009	Update/07	Update/09	Update/07	Update/09	>2010	
<b>TRANSMISSION LINE SUSTAINING</b>							
TRANSMISSION LINE URGENT REPAIRS		326	288	331	293		
RIGHT OF WAY ENHANCEMENTS		347	311	384	345		
PINE BEETLE KILL HAZARD TREES			1,218		821		
RIGHT-OF-WAY RECLAMATIONS		326	550	383	602		
TRANSMISSION CONDITION ASSESSMENTS		680	427	760	496		
SWITCH ADDITIONS					132		
FUTURE YEAR REHABILITATION		1,760	1,639	2,006	1,888		
20 LINE REBUILD			1,943		1,540		
27 LINE REBUILD			648		642		
30 LINE REHABILITATION					350		
6A LINE REHABILITATION	x						
26 LINE REHABILITATION	x						
28 LINE REHABILITATION	x						
<b>SUBTOTAL - TRANSMISSION LINE SUSTAINING</b>		<b>3,439</b>	<b>7,024</b>	<b>3,864</b>	<b>7,109</b>		
<b>STATION SUSTAINING</b>							
STATION ASSESSMENT AND MINOR PROJECTS		1,210	620	1,298	680		
STATION UNFORESEEN REPAIRS		447	473	445	448		
CMMS	x						
BULK OIL BREAKER REPLACEMENT		780			292		
WARFIELD TERMINAL CONNECTOR REPLACEMENT AND DEFICIENCY CORRECTION	x						
GROUND GRID UPGRADES		300	572	322			
TRANSFORMER OIL FILTRATION/REPLACEMENT				264			
LTC OIL FILTRATION			32	258	64		
KASLO SUB UPGRADE				1,265		x	
PINE STREET BREAKER REPLACEMENT			345				
SLOCAN CITY - VALHALLA SUBSTATION UPGRADE			2,173				
PASSMORE SUBSTATION UPGRADE					1,987		
PRINCETON RECLOSER REPLACEMENT					1,513		
JOE RICH BREAKER					404		
CRESTON SUBSTATION PROTECTION			488				
WEST OSOYOOS TRANSFORMER REHABILITATION	x						
GRANDFORKS TERMINAL NOISE REDUCTION	x						
WESTMINSTER TRANSFORMER 1 REPLACEMENT	x						
TROUT CREEK TRANSFORMER 1 REHABILITATION	x						
REPLACE COFFEE CREEK T2							x
REPLACE CRAWFORD BAY TRANSFORMER 1							x
TAP CHANGER LEAK REPAIR AND UPGRADE	x						
<b>SUBTOTAL - STATIONS SUSTAINING</b>		<b>2,737</b>	<b>4,703</b>	<b>3,852</b>	<b>5,388</b>		
<b>TOTAL - TRANSMISSION</b>		<b>58,083</b>	<b>96,123</b>	<b>41,174</b>	<b>88,675</b>		

## Distribution

DISTRIBUTION PROJECT DESCRIPTION	Complete	2009 (\$000s)		2010 (\$000s)		Scheduled >2010	Cancelled
		<2009	Update/07	Update/09	Update/07		
<b>DISTRIBUTION GROWTH</b>							
NEW CONNECTS SYSTEM-WIDE		8,401	9,788	9,291	10,670		
CIAC (credit amount)							
<b>KELOWNA AREA</b>							
KELOWNA GENERAL FEEDER PROTECTION	x						
MCKINLEY LANDING CAPACITY UPGRADE(#2 TO 477) FED SEXSMITH 3	x						
NEW GLENMORE FEEDER (50 LINE UNDERBUILD HIGH RD-CLIFTON)	x						
HOLLYWOOD 1 - DG BELL 3 / FA LEE 2 TIE	x	1,500					
HOLLYWOOD 1 - OK MISSION 1 TIE ALONG KLO RD	x						
MCKINLEY TO CLIFTON TIE				633		x	
FA LEE 2 - HOLLYWOOD 5 TIE, ADD N.O.	x						
GLENMORE 1 AND 2 / HOLLYWOOD 4 U/G CABLES	x						
HOLLYWOOD 1 AND 2 TIE	x						
FA LEE 2 REGULATOR	x						
SEXSMITH 4 REGULATOR							x
FEEDER EGRESS CABLES							x
NEW GLENMORE FEEDER			788				
FUTURE KELOWNA DISTRIBUTION UPGRADES		1,200		1,292		x	
HOLLYWOOD 3 - SEXSMITH 4 TIE		250			365		
AIRPORT WAY UPGRADE					1,551		
<b>PENTICTON</b>							
PRINCETON 4 CAPACITY UPGRADE		1,350				x	
OK FALLS 3 CAPACITY UPGRADE	x						
<b>OSOYOOS/OLIVER</b>							
25 KV TIE TO ANARCHIST/BRIDESVILLE						x	
OLIVER 01 REGULATOR					137		
<b>SIMILKAMEEN</b>							
KEREMEOS FEEDER				158		x	
KEREMEOS 1 CAPACITY UPGRADE	x	200					
KEREMEOS 2 CAPACITY UPGRADE	x						
<b>BOUNDARY/GRAND FORKS AREA</b>							
CHRISTINA LAKE FEEDER 1 CAPACITY UPGRADE			608		489		
<b>TRAIL/ROSSLAND AREA</b>							
W. TRAIL VOLTAGE CONVERSION	x						
PATERSON 25 KV FEED	x						
BEAVER PARK FEEDER 2 TO FRUITVALE FEEDER 1 TIE/UPGRADE					1,227		
<b>SOUTH SLOCAN</b>							
VALHALLA 1 CAPACITY UPGRADE	x						
<b>CRESTON AREA</b>							
CRAWFORD BAY 2 CAPACITY UPGRADE	x						
<b>GENERAL</b>							
SMALL CAPACITY IMPROVEMENTS, UNFORSEEN PRIMARY & SECONDARY VOLTAGE PROBLEMS, RELIABILITY IMPROVEMENTS, SWITCHING IMPROVEMENTS		730	974	787	994		
<b>SUBTOTAL - DISTRIBUTION GROWTH</b>		<b>13,631</b>	<b>12,158</b>	<b>12,161</b>	<b>15,433</b>		



**Distribution cont'd**

DISTRIBUTION PROJECT DESCRIPTION	Complete	2009 (\$000s)		2010 (\$000s)		Scheduled	Cancelled
	<2009	Update/07	Update/09	Update/07	Update/09	>2010	
<b>DISTRIBUTION SUSTAINING</b>							
DISTRIBUTION CONDITION ASSESSMENTS		710	599	760	667		
DISTRIBUTION REHABILITATION		2,060	3,124	1,974	3,470		
PINE BEETLE KILL HAZARD TREES			722		551		
RIGHT-OF-WAY RECLAMATION		639	621	686	646		
DISTRIBUTION LINE REBUILDS		1,931	1,178	2,143	1,167		
SMALL PLANNED CAPITAL		410	668	419	747		
PCB PROGRAM		870	1,073	919	1,117		
FORCED UPGRADES AND LINE MOVES		1,396	1,255	1,472	1,461		
DISTRIBUTION URGENT REPAIRS		1,572	1,911	1,564	1,805		
AESTHETIC AND ENVIRONMENTAL UPGRADES		100	100	105	100		
COPPER CONDUCTOR REPLACEMENT			4,798		6,586		
<b>SUBTOTAL - DISTRIBUTION SUSTAINING</b>		<b>9,688</b>	<b>16,049</b>	<b>10,042</b>	<b>18,317</b>		
<b>TOTAL - DISTRIBUTION</b>		<b>23,319</b>	<b>28,207</b>	<b>22,203</b>	<b>33,750</b>		

**Telecommunications, SCADA and Protection and Control**

TELECOM, SCADA, P&C PROJECT DESCRIPTION	Complete	2009 (\$000s)		2010 (\$000s)		Scheduled >2010	Cancelled
		<2009	Update/07	Update/09	Update/07		
<b>TELECOM, SCADA, P&amp;C GROWTH</b>							
DISTRIBUTION SUBSTATION AUTOMATION, METERING AND COMMUNICATIONS			1,000	1,338		1,438	
TRAIL-OLIVER PHASE 1 HIGH CAPACITY COMMUNICATIONS	x		2,400				
TRAIL-OLIVER PHASE 2 HIGH CAPACITY COMMUNICATIONS							x
TELECOMMUNICATIONS BACKBONE LOOP CLOSE							x
TELECOMMUNICATIONS FOR BUSINESS SYSTEMS							x
<b>SUBTOTAL - TELECOM, SCADA, P&amp;C GROWTH</b>			<b>3,400</b>	<b>1,338</b>		<b>1,438</b>	
<b>TELECOM, SCADA, P&amp;C SUSTAINING</b>							
NARROW SPECTRUM CONVERSION	x						
HARMONIC REMEDIATION			105	117	114	119	
RELAY TEST/MAINTENANCE PROCESS	x						
COMM EQUIPMENT TEST/MAINTENANCE PROCESS	x						
PROTECTION UPGRADES			651	448	697	508	
FAULT LOCATING INACCESSIBLE LINES			158	0		0	
COMMUNICATIONS UPGRADES			321	299	121	111	
<b>SUBTOTAL - TELECOM, SCADA, P&amp;C SUSTAINING</b>			<b>1,235</b>	<b>864</b>	<b>932</b>	<b>738</b>	
<b>TOTAL - TELECOM, SCADA, P&amp;C</b>			<b>4,635</b>	<b>2,202</b>	<b>932</b>	<b>2,176</b>	