



IN THE MATTER OF

**West Kootenay
Power Ltd.**

**CERTIFICATE OF PUBLIC
CONVENIENCE AND NECESSITY**

LINE No. 44

DECISION

August 5, 1998

Before:

**Peter Ostergaard, Chair
Lorna R. Barr, Deputy Chair
Colin Kinsley, Commissioner**

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COMMISSION ORDER NO. C-13-98

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1.0 BACKGROUND

West Kootenay Power Ltd. (“WKP”, the “Utility”) identified the need to upgrade the 44 Transmission Line from Oliver to Osoyoos in its rate application of November 1995. In its rate decision of July 4, 1996 on the negotiated settlement, the British Columbia Utilities Commission (“the Commission”) designated the upgrade as an extraordinary capital expenditure that would require approval by means of a Certificate of Public Convenience and Necessity (“CPCN”) under Section 45 of the Utilities Commission Act.

WKP applied to the Commission for a CPCN (“the Application”) on November 19, 1997. WKP stated in its Application that the present line had reached its thermal capacity and had reached the end of its useful life. The new line would increase the capacity and improve reliability. Prior to filing its Application, WKP attempted to obtain public input to its planning process through media releases and a customer forum. As a result of negative responses to WKP’s initial routing options the Utility refocused its Application around the existing right of way (“ROW”). The Commission, by Order No. G-123-97, requested written public comments and on April 1, 1998, by Order No. G-33-98, ordered that a Public Hearing into the Application take place in Osoyoos. On June 23, 1998, a Town Hall meeting was held and on June 24, 1998, the Public Hearing was held.

1.1 Project Description

WKP’s Application of November 19, 1997, sought approval from the Commission to rebuild the present 63 kV, 44 Line, to 138 kV standards on the existing ROW with two exceptions. WKP proposed to relocate a section of line from Highway 97 south of Deadmans Lake to the abandoned Kettle Valley Railroad ROW which is adjacent to the highway on the east side. WKP also proposed a relocation from an area which has been designated by the Town of Osoyoos for a proposed golf course, if the Utility could come to an agreement with the Town prior to construction. At the Town Hall meeting and Public Hearing, WKP advised it was now applying to use the west side of the existing Highway 97 ROW south of Deadmans Lake. It also advised that the proposed relocation to better accommodate the golf course would not proceed.

WKP has estimated the capital cost for this project at \$3,610,000. WKP requested approval by March 31, 1998, in order to begin construction by July 1998 to meet 1999 summer loads. At the hearing WKP submitted revised schedules which showed construction beginning on September 24, 1998, and completion by November 11, 1999 (Exhibit 10).

1.2 Public Consultation Process

WKP conducted a three-part public consultation process. Initially public consultation was conducted by the Stanley Consulting Group and consisted of personal interviews and written responses involving local interest groups and government organizations. During Phase 2, copies of an environmental overview report, entitled "Proposed 44 L Transmission Line Environmental Overview", were made available to the public through the local WKP offices in Oliver and Osoyoos. This generated a number of petitions and letters to both WKP and the Commission. Most of the letters expressed opposition to the Flood Control Channel route option of 44 Line. WKP then conducted a third phase, which consisted of a WKP organized and sponsored customer forum. This forum was comprised of approximately 40 participants selected from various customer classes. The outcome of this forum was a recommendation to rebuild the line along its present alignment. Subsequently, in November of 1997, WKP applied to the Commission for a CPCN to rebuild the 44 Line generally in its present location to 138 kV standards. The Commission set down a process for written public input by Order No. G-123-97. After receiving written submissions, the Commission decided that further public involvement was necessary and set down the public hearing process by Order No. G-33-98, dated April 1, 1998. Public notices were issued between April 20 and April 22, 1998.

2.0 LOAD GROWTH

2.1 Line Capacity

Line 44 was built in the late 1930's and has a thermal rating of 19.5 MVA at 40 degrees Celsius. The present Osoyoos load is now reaching 18 MVA during summer temperatures of 40 degrees Celsius. WKP testified that the expected load under normal design temperatures will be 16.7 MVA this summer, 17.8 MVA in 2003, 19 MVA in 2008, and 20.3 MVA in 2013. Under extreme temperatures

(40-42 degrees Celsius) this load will increase to 18.3 MVA this summer, 19.6 MVA in 2003, 20.9 MVA in 2008, and 22.3 MVA in 2013 (T. 78, 114, 92). The design rating for the new line when operated at 63 kV will be 55 MVA at normal temperatures. This rating is well beyond the 20 year planning horizon for load growth in the Osoyoos area.

2.2 Reliability

WKP also testified that they would not expect an increase in reliability of the line if it was operated at 138 kV (T. 79). However, WKP stated that the increased insulation levels from 138 kV construction would provide an increased measure of protection from dust and other airborne contaminants and it expects fewer cross-arm failures caused by fires (T. 67). In response to a question during the hearing, WKP testified that the additional cost of building this line to 138 kV standards would be approximately \$90,000 due to the higher cost of longer insulators.

A number of intervenors objected to the additional money being spent on 138 kV construction when the capacity requirement was not needed within the 20 year planning horizon and the sections within Highway 97 ROW were only permitted by Ministry of Transportation and Highways (“MoTH”) for 63 kV (Exhibit 7). (This class of Transmission Line is normally referred to as 60 kV, but may be operated within a ± 10 percent range, i.e. 54 kV to 66 kV.) The Osoyoos Indian Band also objected to rebuilding the 44 Line to 138 kV until further information could be provided with regard to health risks (Exhibit 44).

2.3 Commission Conclusions

When sizing capacity of new or rebuilt power lines it has often been prudent to include optimistic views of load growth since the incremental cost of higher capacity is typically small. However, in the case of this rebuild a design of 63 kV would allow a capacity of 55 MVA which is well in excess of foreseeable needs. **The Commission, therefore, is not prepared to authorize the added cost of 138 kV insulators and requires WKP to construct the new line using 63 kV insulators.**

3.0 CORRIDORS AND ROUTE OPTIONS

3.1 Corridors

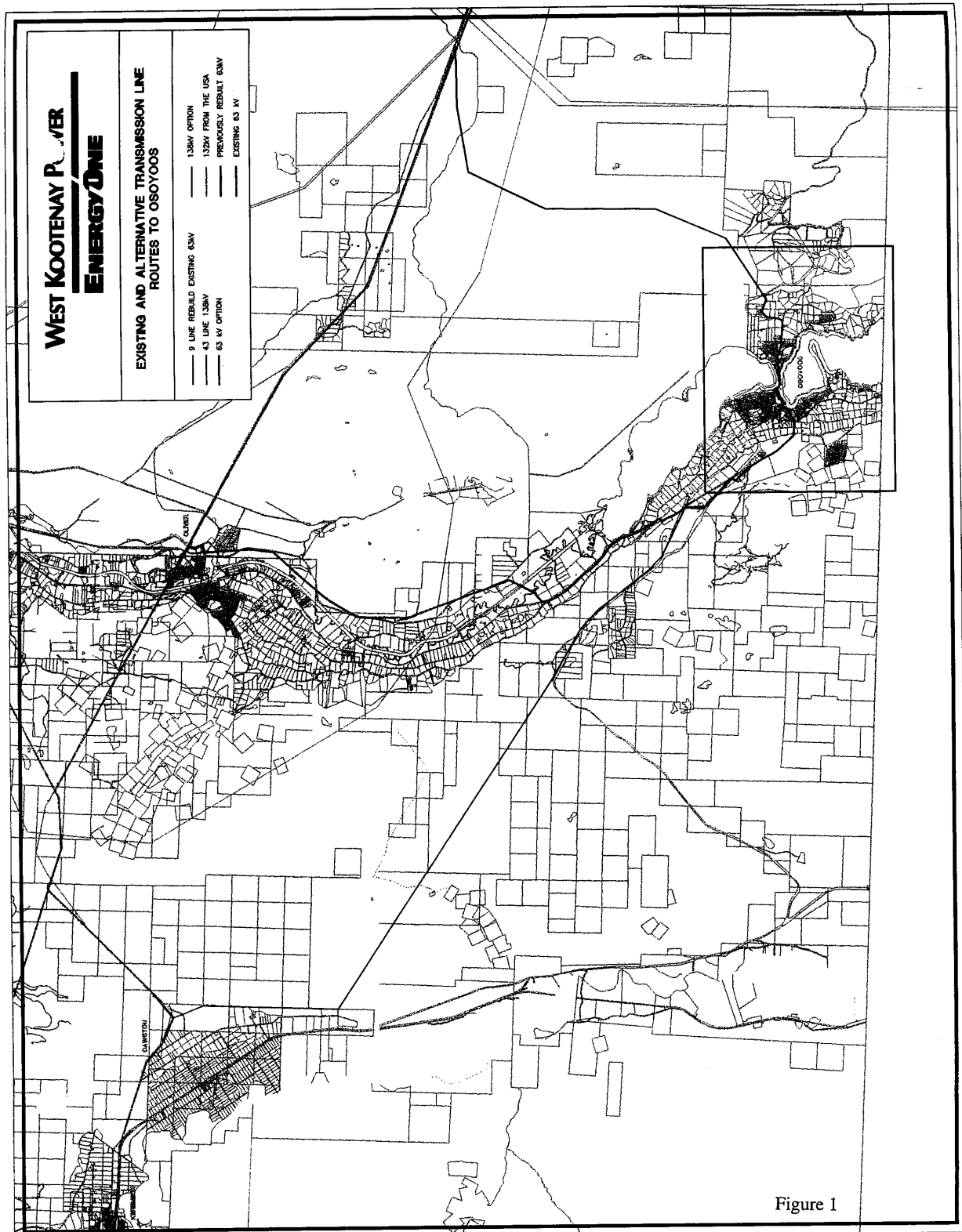
WKP examined three alternative transmission line corridors for supplying the Osoyoos area. Two of the corridors involve new rights of way while the third involves a new line in the existing corridor from Oliver to Osoyoos (44 Line). All three alignments terminate at the existing substation in Osoyoos, and for all three alignments the underbuild portions of the 44 Line would still be required to serve distribution loads along its length.

The corridors involving new rights of way are a tap from the Trail-Oliver 63 kV 9 Line from a point 15 km east of Oliver, and a tap from the Princeton to Oliver 138 kV 43 Line at Keremeos (see Figure 1).

The 9 Line tap would involve upgrading the present line from Oliver to the tap-off point, and constructing 15 km of new line south to Osoyoos over Anarchist Mountain. The Osoyoos substation would be accessed either by a route over the narrow Highway 3 Causeway or by an under-lake crossing. The incremental cost of the under-lake crossing is about \$400,000. The 9 Line option contemplates the retention of 44 Line to create a backup supply, entailing immediate (\$380,000) and ongoing (\$75,000 per year) expenditures. In addition to project carrying costs, all three options reduce line losses, so cost estimates are calculated in “Present Value of Required Revenue” terms. For the 9 Line tap, the net cost using this calculation is \$4,443,000, assuming a Causeway routing.

The 43 Line tap corridor would bring a new 138 kV line along Highway 3 from Keremeos. With 43 Line energized at 138 kV, a new transformer would be needed at Osoyoos. The net cost of the 43 Line tap is approximately \$7,520,000, calculated in present value of required revenue terms.

The rebuild of the existing line has a net cost of \$4,056,000 which is 54 percent of the net cost of the 43 Line tap, and 91 percent of the net cost of the 9 Line tap assuming a Causeway routing.



At the Town Hall meeting and the Public Hearing some participants expressed concern about the rebuild option because it does not provide a backup line to Osoyoos. Those participants are in favour of a second line to Osoyoos, citing increased reliability from having a backup supply as a reason for supporting one of the other transmission line corridors. Participants commented on the number of outages being experienced in Osoyoos. WKP acknowledges that an analysis of reliability data shows that Osoyoos experiences both frequent and lengthy outages (Exhibit 4). Seventy-five percent of the outage time to the residents of Osoyoos is attributed to structure failures of the 44 Line, with many outages due to the advanced age of the line (Exhibit 1, p. 7). Lightning exposure of the 11 Line and other system collapses, which are unrelated to the 44 Line, cause 25 percent of the outage time. According to WKP a second line would have minimal impact on the frequency of outages because these outages are caused by upstream facilities. WKP testified that a rebuild of Line 44 should improve reliability by one outage per year or by two hours per year (T. 56).

A WKP planning committee examined the need for a backup supply and concluded that a second supply to Osoyoos could not be justified and that the existing line needed to be replaced for reasons of physical deterioration and safety (Exhibit 1). Residents affected by a new ROW for the 9 Line option, in particular, are opposed to that option. Other participants do not see a need to establish new rights of way when the line can be rebuilt along the existing ROW.

WKP hired the Stanley Consulting Group to prepare an Environmental Overview Report of the three general alignments (Exhibit 2). This report also identified various route options for the proposed rebuild of 44 Line. In addition, a preliminary environmental assessment of the proposed 9 Line tap was prepared for WKP by Ophiuchus Consulting (Exhibit 4). No environmental impact assessment was prepared for the 43 Line tap alignment. However, WKP has identified that social impacts of the 43 Line tap alignment would be associated with its routing adjacent to recreational and residential properties in west Osoyoos, the relocation of the substation, and associated new feeder lines into the substation.

The environmental impacts of the 9 Line tap were studied in the Ophiuchus report and include wildlife habitat impacts, potential for land erosion, loss of mature and snag trees, weed introduction, and conflicts with Protected Area management goals. Some of the social impacts include conflicts with

business and tourist facilities such as the Pioneer Walkway in east Osoyoos, an expansion of the present substation, and a new line along five blocks of residential housing through west Osoyoos.

Environmental and social impacts associated with the rebuilding of the present route include disturbance to orchards and vineyards which have grown under the existing lines, damage to rare and endangered plant communities arising from clearing, and possible wildlife habitat damage. The conclusion of the Stanley report and WKP's summation of the social and environmental impacts is that the 44 Line rebuild would have the least impact (Exhibit 4).

After an examination of the alternatives, WKP rejected the 9 Line and 43 Line tap options for a number of reasons including cost, environmental impacts and public concerns, especially about the 9 Line causeway routing. WKP concluded that the 44 Line corridor between Oliver and Osoyoos was the preferred alternative.

3.2 Route Options

Within the 44 Line Oliver to Osoyoos corridor, WKP investigated four route options for the portion of the route from Oliver to Highway 97 north of Osoyoos Lake. From this point to the Osoyoos substation the routing is the same for all four options. The options are:

- the existing ROW generally following Black Sage Road;
- the abandoned Kettle Valley Railway ROW from Pine Street in Oliver;
- the abandoned Irrigation Ditch West of Oliver and Highway 97; and
- the west bank of the Okanagan River Flood Control Channel.

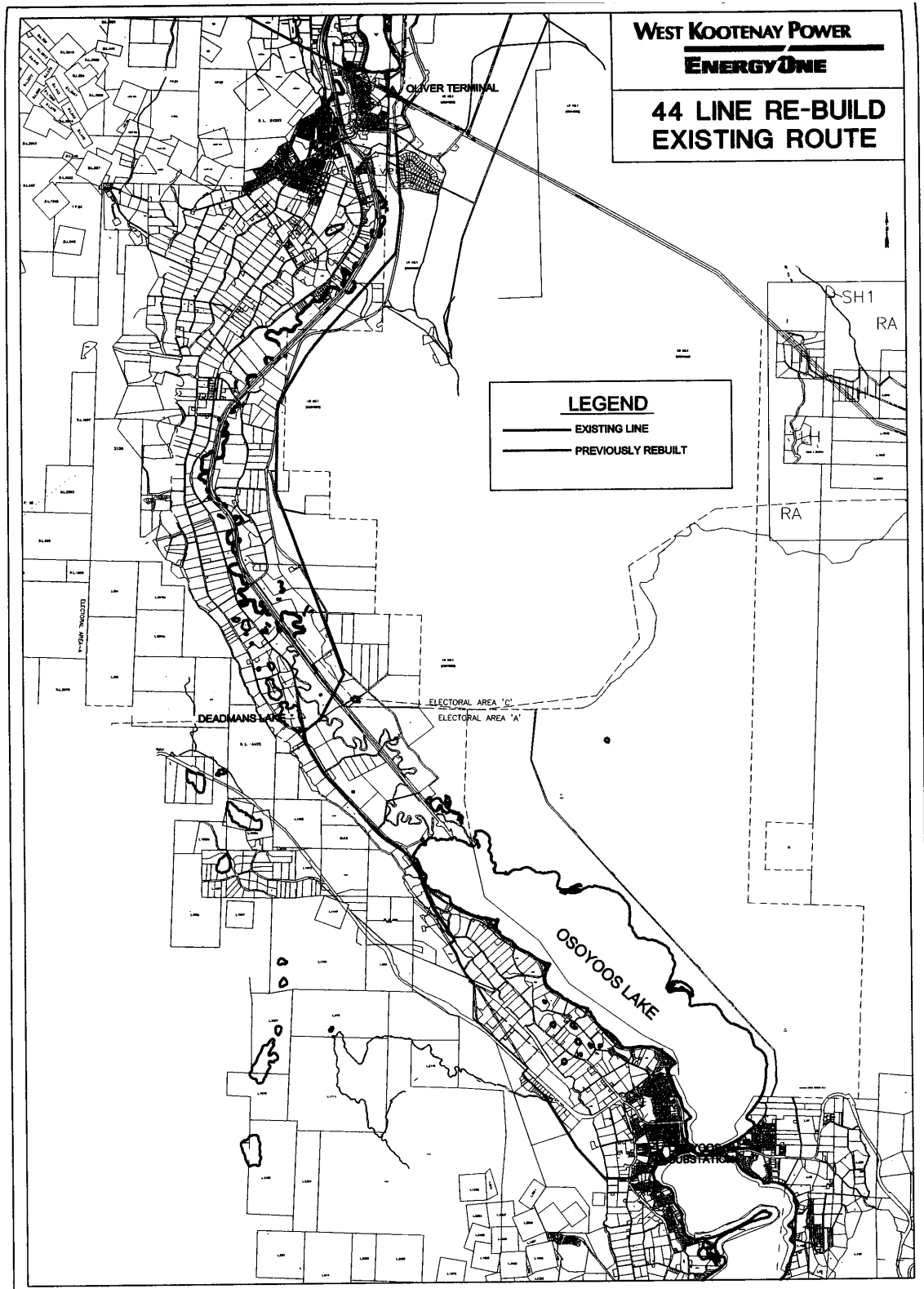
The two least cost route options in this corridor are the existing ROW and the Okanagan River channel route. WKP initially preferred the Okanagan River channel route because of better accessibility for maintenance and emergency response. However, the impact of this option on the Oliver hike and bike trail adjacent to the channel generated considerable public opposition. On the basis of WKP's public consultation process and the preferences of those who participated in its customer forum, the route along the existing ROW seemed to be the option preferred by the public.

3.3 The Proposed Route

In its CPCN application, WKP is asking the Commission to approve a route along its existing 24 kilometer ROW. There is a small deviation from the existing route for approximately 2 kilometers to the south of Deadmans Lake to meet a MoTH condition that requires WKP to accommodate any future expansion of Highway 97 to four lanes (Letter from MoTH dated March 6, 1998), (Exhibit 7). In the existing ROW the new line would be constructed next to the present line. The old line will be removed. The existing ROW is 99 feet wide which is a standard industry width (T. 83). See Figure 2 for a schematic of the proposed route.

The new line commences at the tap to the Pine Street substation on the outskirts of Oliver and follows the existing ROW generally in the vicinity of Black Sage Road. In this area it crosses over the Osoyoos Indian Band reserve and land containing orchards and vineyards. By Band Resolution dated May 26, 1998, the Osoyoos Indian Band gave WKP authorization to construct a new line next to the old one (Exhibit 14). By letter dated July 14, 1998, the Osoyoos Indian Band limits this support of the new line to a maximum 60 kV capability until further information can be provided about the health risks of high voltage transmission lines (Exhibit 44).

About 8 kilometers south of Oliver the existing ROW crosses the South Okanagan Wildlife Management Area ("SOWMA") which contains protected wetlands. It then crosses agricultural land and intersects with Highway 97 at Deadmans Lake. To the south of Deadmans Lake the proposed route would move from its present location on the east side of the highway to the west side of the highway for approximately 2 kilometers. This routing is still within the current ROW for Highway 97. From here the route continues south adjacent to Highway 97. At the north end of Osoyoos Lake the ROW turns westwards away from the highway onto the benchlands. It then proceeds south towards the Osoyoos Golf and Country Club. From the golf course the ROW turns east through residential and commercial areas to the Osoyoos substation.



Where the ROW crosses orchards and vineyards there are some problems with access to the line for maintenance and in emergency situations as a result of encroachments on the ROW. WKP stated that it is addressing these issues with the landowners concerned. WKP also proposed an exchange of ROW with some owners in exchange for access to the line. To overcome access problems in this area one intervenor suggested the line be moved from the existing ROW to a route beside Black Sage Road (T. 140, 143). WKP said that they have explored the option of rerouting the line but some of the landowners along the proposed routing are opposed to this suggestion (T. 53). In addition, permission from the MoTH would be required for any route alignment within a MoTH ROW.

The proposed realignment of the route in the vicinity of Deadmans Lake was raised as an issue at both the Town Hall meeting and Public Hearing. In a letter dated March 6, 1998, the MoTH gave WKP permission to rebuild its line energized to a maximum of 60 kV subject to certain conditions. The conditions imposed by MoTH are to accommodate the future construction of a four lane highway in this location. While there is no schedule to construct this new four lane project, MoTH suggests that by accommodating the proposed highway expansion now, poles will not require relocation in future (Exhibit 7). There is a protocol agreement between MoTH and WKP which states that MoTH will pay for the relocation of transmission structures if the relocation is initiated by MoTH. However, this provision does not apply to this project. WKP is required to pay for any costs of relocation whether initiated by MoTH or WKP (Exhibit 7, MoTH letter).

The alignment proposed by WKP along the west side of Highway 97 to accommodate the proposed highway expansion will directly affect at least five property owners on that side of the highway. One owner noted in the Town Hall meeting that the proposed pole location is unacceptably close to her property (T. 50, 51). The impact of the relocation and pole placements on property values are also of concern to residents. One suggestion put forward by participants is to underground the line for the 2 kilometer section involved. According to WKP the cost to underground this section of the line is estimated at \$1.5 million (T. 86). WKP stated that it would rather provide compensation to those affected than underground the line. WKP notes that this is a gesture of goodwill rather than a necessity as the route along the west side is on the MoTH ROW and does not require the acquisition of new ROW. Another suggestion was to retain a route along the east side of the highway in an alignment that

would not conflict with any potential highway expansion. However, this could affect a mobile home park on that side of Highway 97. WKP agreed to hold a meeting with the Ministry of Environment, Lands and Parks, the MoTH and all affected parties to try and find a solution to allow the line to remain on the east side of the highway. Should a solution on the east side of the highway not be possible WKP said that it will revert to the proposed west side alignment. In response to questioning, WKP also indicated that it could build the line in its current location under existing MoTH permitting and that when the highways project proceeds the line would have to be relocated (T. 102).

While utilization of the existing ROW reduces the environmental impact of the new line, the line does cross some environmentally sensitive areas, most notably the crossing of the Okanagan Canal and the SOWMA lands. The SOWMA contains important waterfowl, wildlife and two rare and endangered plant communities (Exhibit 21, p. 8). In addition, some parts of the line are not easily accessible and new access roads would be required, some through environmentally sensitive areas (Exhibit 21, p. 5). Where the line crosses orchard lands, fruit trees have been allowed to encroach on the ROW. In these locations some of the trees may need to be removed but in general it is anticipated the fruit trees on the ROW will remain intact (Exhibit 21, p. 20). WKP also committed to pay the cost of repairs to fruit trees or orchards, which may be damaged by construction (T. 74-75). The Draft Acres Environmental Guidelines Report ("Draft Acres Report"), dated February 6, 1998, provides WKP with recommendations to minimize impacts from construction of the line (Exhibit 21). For example, it is recommended that construction should be avoided between March to June in the SOWMA to avoid the period when birds are breeding in the wetlands. The report also suggests that WKP consider using a qualified environmental monitor to assist the construction crew in minimizing impacts in sensitive areas and to monitor clean up and site restoration activities.

In a letter dated June 17, 1998, the Ministry of Environment, Lands and Parks ("MELP") stated that they "do not object to the proposal" as long as WKP addresses a number of concerns outlined by MELP. These include prior MELP authorization to cross watercourses and the Okanagan River, measures to prevent land erosion that may cause siltation of watercourses, measures to revegetate disturbed ground and a timeline between August 1 and September 1 for undertaking and completing work in and around any watercourses (Exhibit 13).

3.4 Commission Conclusions

While the Commission acknowledges that several participants at the meeting and Hearing believe that a second line to Osoyoos in a different corridor is required to reduce the frequency or duration of outages in the supply of electricity to Osoyoos, the Commission is not persuaded that a second line to Osoyoos is necessary at this time. Some of the reliability problems being experienced by WKP would not be addressed by any of the transmission line alternatives as they occur upstream from these alternatives. The physical deterioration and safety concerns relating to the existing line need to be addressed whether this line serves as a primary source of supply or as a backup line. The Commission is also aware that there are difficulties associated with acquiring new rights of way and that the environmental impacts associated with the clearing and utilization of a new ROW are significant.

The evidence shows that there is general support for building the line along the existing ROW except for the proposed deviation in the vicinity of Deadmans Lake. **The Commission accepts the route proposed by WKP in the existing 44 Line ROW. With respect to the proposed deviation from the existing alignment which involves a new route along the west side of the MoTH ROW for approximately 2 kilometers the Commission does not accept this routing at this time. Instead, the Commission accepts the suggestion of WKP to hold a meeting with the Ministry of Environment, Lands and Parks, MoTH and other affected parties to try and achieve a consensus on a suitable route on the east side of the highway. In the event that a consensus cannot be achieved, and subject to confirmation from the MoTH, the Commission is of the view that the line should be rebuilt along the present alignment.** It appears that there are no immediate plans to upgrade the highway and it could be many years before an upgrade is undertaken, if at all. In the event that a highway upgrade does take place, this small section of the line can be relocated at that time at no cost to MoTH. **WKP is to provide a detailed report to the Commission on the meeting with stakeholders and on its progress in resolving the alignment of the line in this section of the 44 Line rebuild project by September 30, 1998.**

WKP indicated at the time of the hearing that the pole placements along the route had not been finalized. The Draft Acres Report contains suggestions with respect to pole placements to minimize impacts on the environment. **In addition, the Commission expects WKP to consult with residents who are directly**

affected along the route before pole placements are finalized. However, it is WKP's responsibility to determine pole placements that are safe and efficient, while accommodating visibility concerns as can best be done in the circumstances.

MELP has issued requirements for WKP to meet with respect to stream crossings and the Okanagan River. The Draft Acres Report also provides environmental guidelines for construction of the line to minimize impacts on the environment and suggests that WKP assign a qualified environmental monitor to the project. The Commission notes that the route traverses some important and unique habitat where disturbance from construction requires special attention. **The Commission is satisfied that if MELP requirements and the guidelines suggested in the Draft Acres Report are followed, environmental impacts can be minimized or mitigated. To ensure that this occurs the Commission instructs WKP to assign a qualified environmental monitor to this project. A report on the environmental monitoring program is to be included in the revised cost estimates and project reports required by the Commission.**

4.0 ELECTROMAGNETIC FIELDS (“EMF”)

4.1 EMF Levels

The Commission has been actively monitoring research into possible health effects of EMF since the late 1980’s. At that time, EMF issues prompted a Commission review of a 230 kV transmission line from Dunsmuir to Gold River on Vancouver Island. The Commission found that there was insufficient evidence to support a presumption of health risks, while espousing “prudent avoidance” practices. The issue has resurfaced in a number of transmission line applications.

Electrons in motion in wires produce electric and magnetic fields. Unlike electric fields, magnetic fields easily penetrate space, buildings, and people. For over two decades, research has been conducted in an attempt to determine whether these magnetic fields cause adverse health effects.

Magnetic fields are typically measured in “milliGauss” (thousands of a Gauss) units. The fields recorded in most dwellings are in the order of a few milliGauss (“mG”) at most, unless appliances are

operational. Magnetic fields are directly proportional to the current, as measured in amperes, and inversely proportional to distance from the current source.

WKP provided a table showing the range of measured magnetic fields for commonly used household appliances and fluorescent fixtures (Exhibit 9). For example, fluorescent fixtures produce 20-40 mG measured one foot from the source (T. 109-110).

WKP's engineering group provided calculations and graphs of EMF profiles of the proposed Transmission Line 44 rebuild (T. 20-23, Exhibit 9). Assuming Line 44 is energized at 63 kV with underbuild and maximum loading, the maximum magnetic field at ground level near the pole would be about 15 mG, declining exponentially to about 3 mG at a horizontal distance of 100 feet from the bottom of the pole.

In response to questions at the hearing, it was further calculated that, at full loading of both the transmission and distribution circuits, a reading of 1 mG would be found 190 feet from the centreline and 0.5 mG at 275 feet. WKP noted that the loading on the line would be about one-third of capacity, so the magnetic field would be reduced commensurately (e.g. about 5 mG near the centreline rather than 15 mG; about 0.3 mG at 190 feet rather than 1.0 mG). WKP also confirmed that the phase arrangements of the transmission circuit were already optimized to obtain maximum cancellation of field effects.

In its Final Argument, WKP noted that the rebuild of Line 44 would not result in higher loads and, therefore, magnetic fields will remain the same and may even be less at ground level because the new poles would be about five feet taller. "Given no incremental EMF, denial of the Application based on EMF considerations can be reasonably expected to have far reaching implications... for existing lines of all utilities" (WKP Final Argument, p. 12).

The possible impacts of EMF on human health were discussed and debated at both the Town Hall meeting and Public Hearing. The views of many residents and intervenors fell into one or more of the following themes:

Prudent Avoidance – Given the current lack of scientific consensus over EMF and public health, a strategy of prudent avoidance should be considered, such as routing new lines away from people and minimizing exposure to household appliances.

Public Perception – Even if there is no link between EMF and health, people perceive a link. This can affect property values and, therefore, more studies are needed.

Electro-sensitivity – Some individuals claim to react adversely to EMF, causing debilitating and chronic health effects, and often necessitating lifestyle and career changes.

Scientific Inertia – It took many years to establish links between cancer and carcinogens, such as tobacco and asbestos, so some believe it is only a matter of time before definitive links will be made between cancer and EMF.

Cancer – Cancer rates seem to be growing in the South Okanagan, and EMF is one possible reason.

Cancer and Other Diseases – In addition to cancers, it is speculated that EMF may be linked to other diseases and syndromes such as AIDS, Alzheimer's, and Sudden Infant Death Syndrome.

Institutional Cover-up – The National Cancer Institute and other organizations repress the results of cancer studies in order to justify their continued existence.

Commission staff retained Mr. Richard Gallagher, an epidemiologist, to give evidence and answer questions at both the Town Hall meeting and Public Hearing. Mr. Gallagher is the head of the Cancer Control Research Program at the B.C. Cancer Agency and a professor in the Department of Health Care and Epidemiology at the University of British Columbia. His work involves researching “etiological factors” — the environmental, lifestyle, genetic and other factors that may predispose people to cancer. Mr. Gallagher has assisted Commission staff on previous EMF reviews. He has both reviewed the extensive literature on EMF and conducted EMF studies in British Columbia. He has no affiliation with any electric utility.

Much of the discussion focussed on the possible causal connection between magnetic fields and human diseases, the epidemiological studies that investigate these links, and the scientific rigor associated with these studies. Mr. Gallagher's position is that the epidemiological evidence associating EMF with cancer is weak, inconsistent, and non-specific, and many studies can be criticized for possible bias and lack of clearly defined measures of exposure:

"I would think that we are going to continue with a number of studies over the next few years which show equivocal results, that is to say very slightly positive or very slightly negative.... as the methods for evaluating the risk have gotten better, the odds ratio or the relative risks have generally gotten closer to one. And what that means to me is that if we find an effect in the future, the effect is apt to be a small one." (T. 185)

And

"What is likely is that we will be left with a little hanging question as to whether there is an effect, at very high magnetic fields for a very, very small number of people who are consistently exposed to... say, 3 milliGauss and up, 3.5 milliGauss and up, 4 milliGauss and up." (T. 186)

Mr. Karow of the Coalition to Reduce Electropollution holds different views on EMF, citing it as a cause of cancer and a possible cause of other diseases and syndromes associated with immune system disorders. Mr. Karow is critical of studies that find little or no evidence of a link between EMF exposure and health, and asks that additional forums and/or hearings be convened by the Commission to debate EMF issues:

"As I stated in the public hearing and in my letters over and over again, EMF studies have been often misrepresented." (July 10, 1998 letter requesting Final Argument deadline extension)

And

"I can only ask the Applicant to carefully read all my letters, so to at least become aware of what is happening in the utility industry, but how EMF exposure (not only electric and magnetic fields) is affecting not only the complete biomass (humans, animals and plants included), the insurance industry, real estate, and who knows which unknown effects are still going to show up sooner or later." (Final Argument, Part IV, p. 4)

And

“I ask the Commission to revisit WKP TL 44 Application and either reject, so the company can apply again, or open this up again, with all sufficient information available to all intervenors and necessary witnesses on hand, and public hearings handled in a more timely manner so the public can be involved and take part as much as possible.” (Karow, Final Argument, Part IV, p. 5)

Some participants argued that the substations in Osoyoos and/or Oliver should be relocated because adjacent land uses (e.g. schools and houses) were not compatible, primarily because of concerns over EMF emitted from the substation. WKP estimates the cost of moving the Osoyoos substation to a WKP-owned site in an industrial area to the northwest at \$1.46 million, about one-third of which would be for new distribution circuits from the new substation site into the town core (T. 104-106). WKP considers that relocation would weaken the Osoyoos distribution system, prompt the need for incremental reinforcement to accommodate load growth, and raise its own land use and aesthetic concerns. WKP has measured magnetic fields in the vicinity of the Osoyoos substation, in response to a request from the adjacent nursery school. Readings decreased from approximately 5 mG at the substation fence to a level where the substation’s influence could not be distinguished from the fields created from the nursery school’s own power consumption.

4.2 Commission Conclusions

The Commission has been keeping itself apprised of EMF research since 1989, and has taken the position that evidence that EMF causes adverse health effects is, to date, inconclusive and inconsistent. Even if one holds the view that magnetic fields from power lines do cause cancer, the fact that the connection has been so hard to prove means that the risk cannot be large.

The Commission agrees with Mr. Gallagher and others in supporting strategies of prudent avoidance and low cost attenuation: e.g. “attempting to route new transmission lines so they avoid people, providing transmission lines right of way” (T. 170) and “where there is an opportunity for relatively low cost attenuation of magnetic fields, we ought to avail ourselves of that where we can” (T. 161). Compared to current levels, a rebuilt Line 44 will not increase, and may decrease, EMF. At the boundary of the 99 foot ROW, milliGauss readings are normally expected to be less than 2.5 mG. Magnetic fields of

2 to 2.5 mG tend to be within the range of acceptable safety limits for those scientists and others who support such limits (T. 171). Readings attributable to the line in adjacent dwelling units would be lower still, depending how far the dwellings are set back from the right of way. A house located 30 feet from the 44 Line ROW would typically have a reading less than 1.4 mG.

In response to Mr. Karow's requests for further discussion of this issue the Commission notes that the hearing was publicly announced on April 20, 1998 and provided a considerable amount of time for participants to prepare material and bring forward witnesses to address the EMF issue. The Commission is, therefore, satisfied that participants had sufficient opportunity to state their case.

The Commission concludes that there is no reason to refuse the application, or require the relocation of its Oliver or Osoyoos substations, on the basis of exposure to electromagnetic fields.

5.0 COMMISSION FINDINGS

Having reviewed the evidence, the Commission is satisfied that the rebuild of Line 44 is necessary and in the public interest. The Commission, therefore, approves the issuance of a Certificate of Public Convenience and Necessity to West Kootenay Power for construction of transmission Line 44 from Oliver to Osoyoos with the following conditions:

- WKP is to construct the line using 63 kV insulators.
- The line will follow the route applied for along the existing ROW except in the vicinity of Deadmans Lake.
- WKP is to consult with stakeholders along the Highway 97 section south of Deadmans Lake and attempt to achieve consensus for a route on the east side of Highway 97, or remain in the present alignment subject to confirmation by MoTH. WKP is to report to the Commission by September 30, 1998, on the outcome of these consultations. WKP is not to start construction of this section until the route in this area is resolved.

- Prior to commencing construction WKP is to advise all property owners and residents along the 44 Line of the nature and timing of the work to be done and resolve any pole placement issues to the extent possible.
- WKP is to assign an environmental monitor to ensure mitigation measures required by the MELP and recommended in the Draft Acres Report entitled “Environmental Guidelines for the Construction of Line 44, Oliver to Osoyoos” are followed.
- WKP is to submit a revised detailed cost estimate by September 15, 1998 for Commission approval which includes costs for environmental monitoring and mitigation measures, estimated damage repair costs, and the savings arising from the use of 63 kV insulators.
- WKP is to obtain all necessary permits, licenses and approvals from agencies having jurisdiction.
- WKP is to file progress reports every two months commencing on September 30, 1998, and upon completion of the project.

Dated at the City of Vancouver, in the Province of British Columbia this 5th day of August, 1998.

Original signed by:
 Peter Ostergaard
 Chair

Original signed by:
 Lorna R. Barr
 Deputy Chair

Original signed by:
 Colin Kinsley
 Commissioner

SIXTH FLOOR, 900 HOWE STREET, BOX 250
VANCOUVER, B.C. V6Z 2N3
CANADA



BRITISH COLUMBIA
UTILITIES COMMISSION

ORDER
NUMBER C-13-98

TELEPHONE: (604) 660-4700
BC TOLL FREE: 1-800-663-1385
FACSIMILE: (604) 660-1102

IN THE MATTER OF
the Utilities Commission Act, R.S.B.C. 1996, Chapter 473
and

An Application by West Kootenay Power Ltd.
to Rebuild the No. 44 Transmission Line from Oliver to Osoyoos

BEFORE: P. Ostergaard, Chair)
L.R. Barr, Deputy Chair) July 30, 1998
C.J. Kinsley, Commissioner)

CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY

WHEREAS:

- A. On November 19, 1998, West Kootenay Power Ltd. ("WKP") applied to the Commission, pursuant to Section 45 of the Utilities Commission Act ("the Act"), for a Certificate of Public Convenience and Necessity ("CPCN") to rebuild the No. 44 Transmission Line from Oliver to Osoyoos to 138 kV standards on the existing right of way; and
- B. On November 27, 1997, the Commission requested public input by Order No. G-123-97, with responses to be sent to the Commission by January 9, 1998; and
- C. On April 1, 1998, the Commission decided that a public hearing into the Application was necessary and by Order No. G-33-98, set down a public process and hearing to be held in Osoyoos on June 23 and 24, 1998; and
- D. A town hall meeting was held on June 23, 1998, and a public hearing was held on June 24, 1998 in the Osoyoos Legion Hall; and
- E. Final written arguments were received by July 24, 1998; and
- F. The Commission has reviewed the Application, the evidence filed prior to the hearing, the evidence filed at the public hearing, and the written arguments. The Commission determines that the rebuild of the No. 44 Transmission Line is necessary and in the public interest.

NOW THEREFORE the Commission orders as follows:

1. A CPCN is granted to WKP to rebuild and operate the No. 44 Transmission Line at 63 kV. WKP is not to install insulators that can accommodate an upgrade to 138kV.

2. This CPCN is subject to WKP obtaining all necessary permits, licenses and approvals from agencies having jurisdiction.
3. WKP is to consult with stakeholders along the Highway 97 section south of Deadmans Lake and attempt to achieve consensus for a route on the east side of Highway 97, or remain in the present alignment subject to confirmation by MoTH. WKP is to report to the Commission by September 30, 1998, on the outcome of these consultations. WKP is not to start construction of this section until the route in this area is resolved.
4. Prior to commencing construction, WKP is to advise all adjacent property owners and residents along the No. 44 Transmission Line of the nature and timing of the work to be done and is to resolve any pole placement issues that may be raised by these owners and residents to the extent possible.
5. WKP is to assign an environmental monitor to ensure that the mitigation measures requested by the Ministry of Environment, Lands, and Parks and recommended in the Acres International Limited draft report entitled "Environmental Guidelines for the Construction of Transmission Line 44, Oliver to Osoyoos", are followed.
6. WKP is to submit, by September 15, 1998, for Commission approval a revised detailed cost estimate, which includes; costs for environmental monitoring and mitigation measures; the savings arising from the use of 63kV insulators; and estimated damage repair costs.
7. WKP is to file with the Commission construction and environmental progress reports for the project every two months commencing September 30, 1998, until completion of the project when a final report is to be submitted. These reports are to address any problems and potential problems and indicate any variations to the construction schedules and cost estimates, as may arise.

DATED at the City of Vancouver, in the Province of British Columbia, this 5th day of August, 1998.

BY ORDER

Original signed by:

Lorna R. Barr
Deputy Chair

**APPEARANCES AT
TOWN HALL MEETING AND PUBLIC HEARING**

G.A. FULTON	British Columbia Utilities Commission, Counsel
R.H. HOBBS	West Kootenay Power Ltd.
R.A. BERNARD	West Kootenay Power Ltd.
R.M. GODFREY	West Kootenay Power Ltd.
K.L. JONES	West Kootenay Power Ltd.
H. KAROW	Coalition to Reduce Electropollution
B. SLACK	Self
R. WINCHESTER	Self
G. MATHESON	Self
B. SMITH	Self
I. TYL	Self
D. HULL	Self
B. LODGE	Self
K. KUECHAU	Self
M. HOOVER	Self
L. HUNTER	Self
G. HOFFMAN	Self
O. QUINTAL	Self
F. WINKLEY	Self
E. WHEELER	Self
A. PATTON	Self
MRS. SUTHERLAND	Self

R.W. RERIE

Commission Staff

ALLWEST COURT REPORTERS LTD.

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