Pemberton Valley Dyking District 2015 Annual General Meeting Report

Pemberton Valley Dyking District – Who are we and what do we do?

The Pemberton Valley Dyking District is a local government agency incorporated by Letters Patent under the Local Government Act.

The PVDD's Letters Patent is dated January 31, 1947 making it the first government agency established in Pemberton. The PVDD letters patent states " The object of the said improvement district shall be the acquisition, maintenance, repair, replacement, improvement, and operation of works for the reclamation and development of the lands in the improvement district by dyking, draining, pumping, and incidental matters thereto".

Improvement districts finance their operations and services through taxes and/or tolls collected directly from landowners in their boundaries. With the challenging geography, many water ways and large dyking infrastructure that exist within the PVDD boundaries combined with the small tax base it is only possible for the PVDD to fund the maintenance of the existing dyke infrastructure. When large capital projects are identified as a high priority the PVDD has been very successful in locating and securing funding from the provincial and federal governments to complete these projects.

Although improvement districts are independent, public corporations, they are also subject to supervision by the provincial Ministry of Community Sport and Cultural Development. The PVDD boundary as identified in the letters patent was amended in March 2014 to remove all IR lands.

In 1947 the Prairie Farm Rehabilitation Administration (a branch of the Agriculture and Agri-Food Canada) began construction of the dyke system, realignment of the Lillooet River and lowering of Lillooet Lake. The PVDD took over responsibility for maintaining the infrastructure that was built and with the help of outside government funding developed the system that exists today.

The PVDD also reports to the provincial Inspector of Dykes, the provincial agency responsible for regulating all dykes in the province.

Board of Trustees

The PVDD is administered by an elected Board of Trustees that consists of 5 Board members. To date there has been no remuneration for the Board positions.

Staff

Staff positions are equivalent to 2 ½ fulltime positions and include:

- Administration – Job shared by two administrators – Equivalent to 1 ¼ full time position due to extra work load during tax time.
- Operations and Maintenance Manager – Equivalent to 1 full time position
- Equipment Operator – Equivalent to ¼ of a full time position (depending on year).

Assets

- Office building and shed
- Fenced and gated lot with secure container located in the industrial park
- 2008 Hitachi 225 excavator
- 2007 JD6615 Tractor with side and rear mower
- Small Jet boat
- Various tools
- 2 Quarries (Green River and Valleau) material to be used for dyking purposes only
- 2011 Chevy 1500 Pick up Truck

Rivers and Creeks

- Lillooet River
- Ryan River
- Miller Creek
- Pemberton Creek

- Green River
- Birkenhead River

PVDD Dyking Infrastructure

- 44 kms of dykes
- 25 kms of ditches
- 25 kms of rip rap bank protection
- 20+ culverts with flap gates

Annual Maintenance

- Inspections – All dykes and associated infrastructure are inspected twice annually, in the spring before the freshet and in the fall after the freshet.
- Mowing – 44 kms of dykes are mowed annually. It takes a minimum of 4 passes to complete the mowing that is the equivalent of mowing 352 kms if a single pass was required. Takes about 6 weeks.
- Rip Rap Repair – The rip rap has stood up well over the years however there are areas that need maintenance on an annual basis.
- Tree Removal – In the Dike Maintenance Act it is prohibited to allow trees or vegetation other than grass to grow in the dyke. The PVDD conducts vegetation control annually in order to comply with this Act.
- Ditch Maintenance – The ditches under the PVDD's jurisdiction are required to drain the land that is located on the land side of the dykes. The ditches require cleaning once every 3 years in order to efficiently convey water and drain the land. The PVDD cleans approximately 8 kms of ditches annually.
- Gravel Removal – Gravel removal is required in:
    - Lillooet River – 15,000 m^3 every 3 years
    - Miller Creek – 1500 m^3 every 2 years
    - Pemberton Creek – Approx. 2000 m^3 once every 5 years

- Culverts/flap gates – Culverts need to be inspected and relined when they become corroded as replacing culverts buried deep within the dyke is very expensive. All flap gates are serviced and maintained.
- Beavers - The beaver population in the valley has increased dramatically in the last few years and unplugging culverts and dealing with dams is a regular occurrence.
- Quarries – It is important to keep material on hand and ready to go for upcoming projects and emergency works if required. The PVDD annually conducts quarry development to ensure this material is available.

2014/15 Project Summary:

2014/15 has been a very busy and productive time for the PVDD. Projects that were undertaken and completed were:

Birkenhead River

During 2011 and 2012 the drainage issues associated with Grandmother Slough were addressed by:

- Replacement of 4 culverts fitted with new flap gates – PVDD and MOTI.
- Removal of grass and vegetation in the slough to improve flow – PVDD.
- Piping of beaver dams – PVDD.

This work had an immediate positive effect on draining the local areas and property after the freshet and drastically reduced the mosquito problem from the industrial park to the lake road.

On April 9th, 2013, a multi-stakeholder group met in Pemberton to discuss urgent works in the Birkenhead River to alleviate the imminent risk and annual flooding to local communities and infrastructure caused by containment breaches along the south bank adjacent to Mt. Currie, the Continental Pole Yard, and HWY 99. Represented at the meeting were the following provincial ministries, federal departments and local authorities, creating the newly established Birkenhead River Technical Steering Committee:

- Pemberton Valley Dyking District
- Squamish-Lillooet Regional District (SLRD)
- Lil'wat Nation
- Village of Pemberton (VoP)
- Ministry of Forests, Lands, and Natural Resource Operations (MFLNRO) Water Section
- Inspector of Dikes
- Emergency Management BC (EMBC)
- Ministry of Transportation and Infrastructure (MoTI)
- Aboriginal Affairs and Northern Development Canada (AANDC)

An approach to address the imminent threat was agreed upon by the group at an estimated cost of $50,000 and included:

1. $12,000 - A risk assessment and mitigation plan to be completed by an engineering firm to provide direction for near and mid to long-term mitigation priorities on the Birkenhead;
2. $38,000 - Concurrently, clear channels of LWD on the north bank, using this LWD removed to reinforce the south bank of the channel and begin to train the river towards the north side of the Pemberton Valley. The PVDD agreed to act as project manager and act as the proponent in the permit application process. This approach was supported by Provincial Waters Section as the provincial regulator, as well as technical experts from MFLNRO. Funding for the project was provided by the stakeholders at an agreed upon ratio based on finalization of financial commitments derived from a conference call on 11 April 2013. With approval of the SLRD Board of Directors and appropriate assurances/legal documentation, bridge financing for the project was provided as necessary by the SLRD, with the understanding that reimbursement to the SLRD for any bridge financing came from members of the stakeholder group as required. Funding was provided by:
   - EMBC
   - MOTI

- AANDC
- SLRD
- PVDD
- VOP

3. Permits were applied for with the Province of BC and DFO and took 3 days to attain and the work to remove the large woody debris took place the next day.
    - Removal of Large Woody Debris – This work took 7 hours and was very successful in directing water into the North Channel.
    - Northwest Hydraulics was commissioned to complete the risk assessment and mitigation plan that was completed in June 2013.

This portion of the Birkenhead River flood mitigation plan was achieved well under the $50,000 budget at a total cost of $17,000.

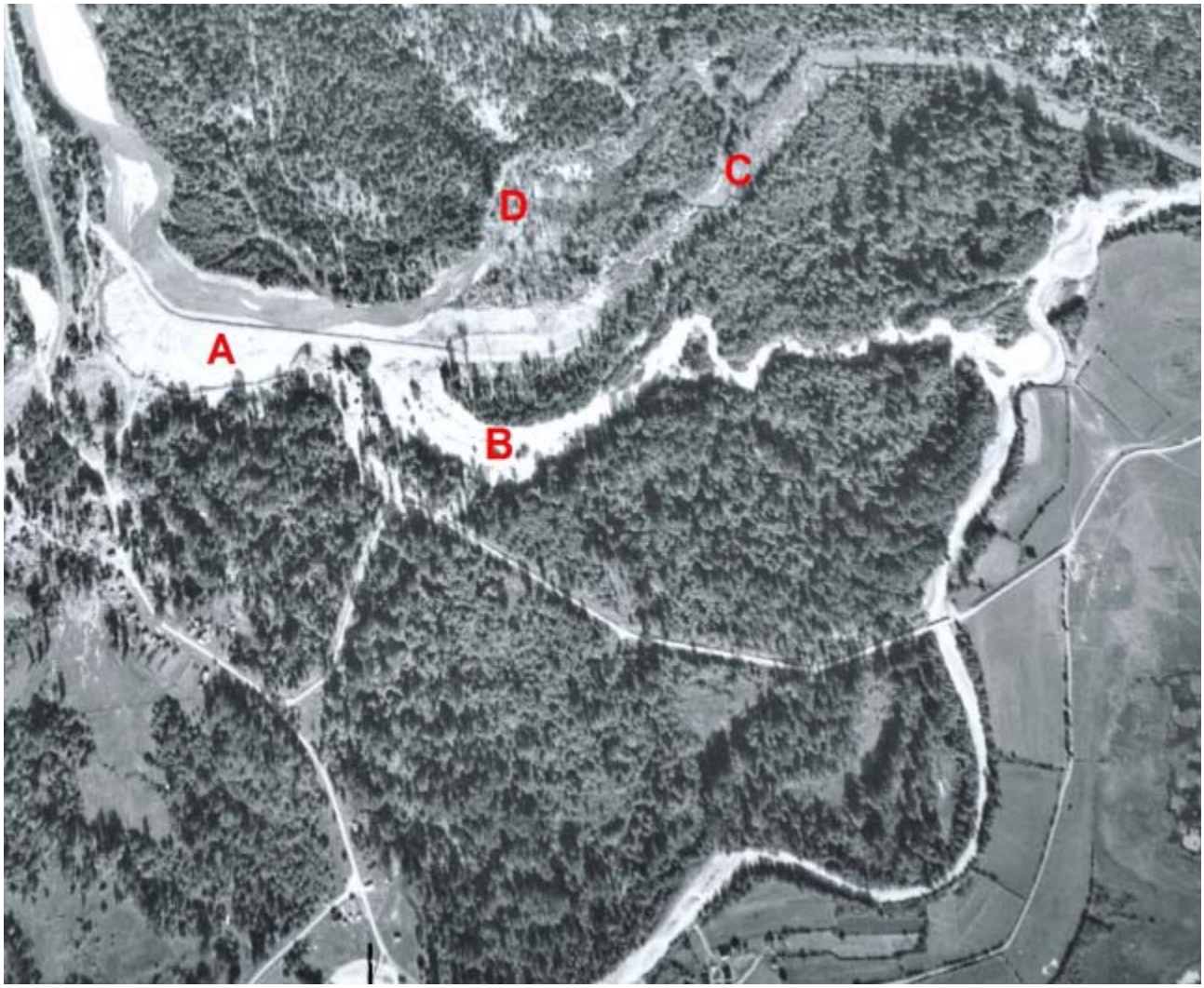
On the evening of May 6th, 2013 the Birkenhead River was observed at an elevation that was less than 10 cms from overtopping the pole yard berm. The PVDD had previously positioned our excavator to the pole yard as a precautionary measure and using the PVDD excavator and Continental Pole's excavator the pole yard berm was reinforced during the night with the little material that was available on site to keep the river from breaching the berm. The SLRD and PVDD initiated an emergency response that night with the assistance of EMBC to build an emergency berm at the pole yard to protect the pole yard, highway 99 and the Mount Currie reserve. The funding approval came in at approximately 11:30 pm on May 6th.

The Funding from EMBC went to the SLRD. The SLRD and PVDD partnered up on the project with the SLRD providing administration expertise and the PVDD managing the construction of the berm. Construction of the berm began on the morning of May 7th, 2013 utilizing material from the PVDD Green River Quarry and took 9,000 m^3 of material, 6 days and $120,000 as funded by EMBC to complete. With the combination of removing the LWD and building the emergency berm flooding was avoided.

In June 2013 NHC completed the risk assessment and mitigation plan with the key points indicating:

1. The flood problems would increase and eventually take out the Pole Yard, Highway 99 and have a serious negative impact on the Mount Currie Old Reserve if nothing was done to elevate the problem.
2. The dry Channel was biggest single issue and needed to be excavated to convey water again and reestablish fish habitat.

Birkenhead River 1946



Birkenhead River 1950

Birkenhead River 2002

Birkenhead River 2009

3. Berm should be extended by approximately 150m to tie into the main back channel.

4. The water survey gauge that was deactivated in the 1970s should be reactivated to help forecast river behavior and predict flood events.

In October 2013 a Birkenhead technical steering committee meeting was held to discuss a plan of action to move forward with the mitigation plan. At the meeting the mitigation measures as recommended by NHC were prioritized in this order

1. Reestablish the dry channel
2. Extend Berm
3. Reactivate Water Survey Gauge

Funding options were discussed in further meetings and AANDC agreed to fund the majority of the channel re-establishment as it was identified as the highest priority.

Final funding approval came in mid January 2014 from:

- AANDC - $322,000
- PVDD – Approx. $17,000 of in kind contributions for permits and project management.
- Lil'wat Nation – Approx $17,000 of in kind contributions for project management and environmental monitoring.

Once the final funding approvals were received a partnership was immediately formed between the Lil'wat Nation and the PVDD. The responsibilities of the partners were:

- Lil'wat – Administration/finance, environmental monitoring and project oversight.
- PVDD – Permits & authorizations from the province of BC & DFO and project management.

The most critical documentation required for the permits and authorizations to be approved was the excavation design and environmental assessment that could not be started until funding was approved, this put the project in an almost, but not quite impossible position timing wise as it was critical that the work took place during the lowest possible water conditions and prior to the spring freshet. Northwest Hydraulics Consulting and EcoFish Environmental Consulting worked very hard to create these documents as soon as possible in order for the approving agencies to have them for consideration to approve the project in time to start and complete the project before the freshet began.

Final permits were received on March 13th, 2013 with a great amount of effort from all the staff at FrontCounter BC, Provincial Water Section and DFO. Construction was started on March 14th, and completed on March 26th. Construction consisted of:

- 3 days of access construction.
- 7 days of gravel excavation (10,000 m^3), installation of bed stabilization system and large wood debris.
- 2 days of access removal and remediation work including planting 40 trees and many plugs.

The project was completed ahead of schedule and under budget. The gravel was sold by ANNDC and the value of this material was used by ANNDC to put against the cost of the project.

It will be necessary in the future to monitor the river behavior in order to ensure that the engineered plans work as expected and that there are no negative environmental impacts to fish and fish habitat. This monitoring will be undertaken by the Lil'wat Nation and PVDD. As of March 15th, 2015 the main channel and all side channels are functioning perfectly and the reestablished main channel is now excellent spawning habitat.

The completion and success of this project was an impressive example of how effective partnerships and many stakeholders working together and believing in the end goal is so important and highly effective.

The PVDD and the Birkenhead Technical Steering Committee will continue to seek funding for the Berm extension and water gauge installation and these projects will be completed as funding is found.

Birkenhead River March 26th, 2014

Ayers Dyke Upgrade

The Ayers Dyke was over topped in 2003 causing major flooding through all areas east of the dyke including Mount Currie. Since 2003 the Ayers Dyke Upgrade has been a very high priority for the PVDD and great time was spent securing the funding required for this project to move forward. In March 2014 funding approval of $611,000 for the Ayers Dyke Upgrade was confirmed by EMBC. The funding was granted through the Building Canada fund that consists

of a three way funding partnership between the federal, provincial and local (PVDD) governments, federal $204,000, provincial 204,000, PVDD 204,000. The project consisted of raising 1400ms of the Ayers Dyke and 560ms of Northwest Road to an elevation consistent with a 200 year flood elevation + 0.5m freeboard. Once Funding was confirmed the design was completed and construction of the project started on August 21st, and ended on October 7th, 2015. Due to the unexpected work required to raise Northwest Road in order to create a logical tie in point at the North end of the Ayers Dyke the project was $17,000 over budget and completed on schedule.

Lillooet River Warning System

In March 2014 funding approval of $30,000 was approved by the province for the $34,500 cost of installing the Lillooet River warning gauge, with the PVDD funding the $4,500 shortfall. In June 2014 the gauge was installed and the warning system is functioning and sending out river data every 15 minutes and sends text and email alarms if there is a sudden decrease or increase in the water levels. This project was possible through the cooperation of the Province of BC, PVDD, VOP, SLRD, and Lil'wat Nation working together and finding solutions.

Miller Creek Gravel Removal

Due to warm alpine temperatures and high glacier melt during the August 2014 fish window the Miller Creek gravel removal project was postponed to August 2015. The PVDD will be removing 1500 m^3 of gravel from the sediment trap/weir located on Miller Creek. The project will take 3 days and all approvals are in place.

Pemberton Creek Rip Rap Repair

In August of 2015 the PVDD will be repairing rip rap on Pemberton Creek about 100 ms downstream of the railway bridge on the left bank. During construction the trail on the Pemberton Creek Dyke will not be available for pedestrian traffic. Construction will take approximately 1 week.

Annual Inspections and Maintenance

In April 2015 the annual inspection of the PVDD dyking infrastructure will take place and any deficiencies found will be repaired prior to the 2014 freshet. In late May the annual maintenance will start and includes:

- Ditch Maintenance
- Tree Removal
- Mowing
- Culvert and flap gate repairs
- Rip Rap repair
- Miller Creek gravel removal

2014/15 Emergency Response

- In early December 2014 the PVDD working in cooperation with the VOP responded to an ice jam in Pemberton Creek that threatened the Highway 99 Bridge, and possible flooding in the Creekside complex and the mobile home park. This work included 2 days of ice removal conducted with a combination of excavator and hand removal.
- In Mid December 2014 a heavy rain event caused local flooding in low areas of the Valley. The PVDD responded with the VOP to both Pioneer Junction and Monte Valle complexes and assisted with pumping and sandbagging. Minor flood damage to garages located in the lowest areas of Pioneer Junction occurred.
- In early February 2015 the PVDD working in cooperation with the PVDD and SLRD responded to flooding in low areas of the Valley. Pumping and sand bagging was required over the 3 day rain event. Noted flood damage to property was minor.

2015 Projects

Pemberton Creek Rip Rap Repair

During the August fish window repair to 100m of rip rap will take place in Pemberton Creek. Project is expected to take 6 working days.

Miller Creek Gravel Removal

During the August fish window approx 1500 m^3 of gravel will be removed from Miller Creek at the sediment catchment weir. This project is expected to take 3 working days.

Arn Canal – Phase 1.

During the August fish window approximately 2kms of the Arn Canal will be cleaned of brush and grass to ensure maximum flow conveyance during high water and heavy rain events. Due to the sensitive fish habitat and fragile salmon run all work in the water will be conducted utilizing hand crews to ensure fish values are protected. Phase 2 will be completed in August 2016. A RPF for the work will be advertised and published on the PVDD web site in April/May 2015

Lillooet River Gravel Removal

The Lillooet River gravel management plan calls for 15,000 m^3 of gravel to be removed once every 3 years. 2016 is the next planned removal. The permit and authorization process will take place in the spring of 2015 with submissions being planned for May 2015.

Pemberton Creek Sediment Removal

Pemberton Creek is sensitive fish habitat that has a delicate run of Coho salmon. As such removing gravel is difficult to accomplish while maintaining and protecting the salmon runs. It is the intent of the PVDD to form a stakeholder group consisting of:

- PVDD
- VOP

- SLRD
- Lil'wat Nation
- MOTI
- Ministry of Forests Lands and Natural Resources - Inspector of Dikes
- Ministry of Forests Lands and Natural Resources – Water Allocations Section
- Department of Fisheries and Oceans

The purpose of this group will be to meet and discuss the issues associated with Pemberton Creek with the intent of:

- Funding the creation of a risk assessment.
- Funding the creation of a environmental assessment

In early 2015 the PVDD had all cross section in Pemberton Creek resurveyed and there is now excellent current and historical data available for the creation of the risk and environmental assessments which will form the foundation to guide the way forward to rectify the sediment deposition issue in Pemberton Creek. Once the assessments are completed the group will reconvene and plan a cooperative solution to the problem. The timing of this project will start in May 2015 and end once the plan has been established and appropriate funding is found. The PVDD will act as the facilitator on this project much like we did on the Birkenhead project.

5 Year Plan

The PVDD has developed a 5 year plan for the budgeting and operation of the dyking district. The highlights of the plan are as follows:

PEMBERTON VALLEY DYKING DISTRICT

5 YEAR PLAN

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PEMBERTON VALLEY DYKING DISTRICT

Preamble

The 5 year plan is a critical document that keeps the public informed and enables the Pemberton Valley Dyking District (PVDD) Board of Trustees to make sound, informed decisions in order to ensure a financially sustainable environment for the long term continued success of the PVDD to supply flood protection operations and maintenance services to existing flood protection works located in the Pemberton Valley. Having the ability to forecast 5 years ahead also creates the ability to make smooth, rational financial adjustments if required to address change in fiscal priorities, rather than abrupt adjustments that can be difficult to absorb on a short term basis. The 5 year plan will be used as a tool to determine and assess:

- Priority Capital Projects.
- Financial commitments for administration, general operations, maintenance, and capital projects.
- Mill rate adjustments.
- External funding requirements.

The 5 year plan is a "living" document that will require annual review and updates in order to address the challenges that are encountered when looking and planning 5 years ahead. These challenges include:

- **Environmental**
  - Occurrences such as extreme high water events that are impossible to accurately forecast and could result in changes to projected priorities and spending plans.
  - Global warming is a real phenomenon that is occurring. With a lack of substantial and meaningful data related to this subject it is difficult to predict and plan for. One obvious effect of global warming that has been recognized by the PVDD is the sustained above average temperatures in the alpine. The high temperatures in the alpine cause sustained glacier melt and above normal stream water levels through the months of July, August and September making projects that require low water conditions during the August/September fish window difficult, if not impossible to complete in an environmentally acceptable and affordable manner.

- **Legal and Regulatory Change -** Change to federal and provincial laws and regulations can have unexpected impacts to the environmental and financial viability of planned projects.
- **Policy Change –** Policy change within the federal and provincial governments can result in additional staff time and costs associated with day to day operations and capital project completions.
- **Funding Opportunities –** As the PVDD relies on outside funding for projects that are financially beyond the capability or responsibility of the PVDD to fund, combined with the challenging global financial environment that exists today makes it difficult to predict and forecast future funding opportunities, most of which are substantially over-subscribed making it very competitive and challenging to be successful with funding requests.

The financial data contained within the 5 year plan will be prepared in a manner that mirrors the financial reporting system that now exists at the PVDD. This will allow the reader to easily make references and comparisons to existing budgets and the 5 year plan.

Assumptions that have been considered and included in the development and updates of the 5 year plan include:

- **Extreme High Water Events** – As it is impossible to forecast when an extreme high water event will occur (last one was October 2003) it is assumed that an event exceeding a 1 in 200 year flood event will not occur within the 5 year term of the plan.
- **Emergency Management BC** – It is assumed that EMBC will continue to support the PVDD with expertise and financial contributions in an emergency flood situations should one occur in order to restore dyke infrastructure to the pre-flood condition.
- **Legal, Policy and Regulations** – It is assumed that all current laws, policies and regulations will remain unchanged during the term of the 5 year plan.