This is an excerpt of the full report to provide an introduction. The full report can be viewed at www.mightypeacewatershedalliance.org

# State of Drinking Water in the Peace River Watershed

Prepared for:

Mighty Peace Watershed Alliance

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# 1 Introduction

## 1.1 Peace River Watershed

The Peace River originates in the Rocky Mountains of British Columbia and flows northeast across northern Alberta, joining with the Athabasca River to form the Slave River below Peace Point (see **Figure 1**). The Slave River is a tributary of the Mackenzie River.


*Figure 1: Peace River Watershed*

Historically, the Peace River originated at the confluence of the Finlay and Parsnip Rivers in northeastern British Columbia. However, since the construction of the W.A.C. Bennett Dam in 1968 and the Peace Canyon Dam in 1980 by BC Hydro, the Peace River headwaters are now Williston Lake, located approximately 170 kilometers (km) upstream from the BC/Alberta border. With the construction of the WAC Bennett Dam, the Peace River flows have been modified with spring and summer flows detained and more water released during the winter.

Within Alberta, the Peace River Watershed includes several important tributaries representing six sub-basins: the Upper Peace, Smoky River (including the Little Smoky and Wapiti Rivers), the Central Peace, the Wabasca River, the Lower Peace and the Slave River, as shown in **Figure 2**. Technically, the Slave River is part of the Great Slave River basin, however it has been included by Alberta Environment and Water (AEW) in the Peace River Watershed Planning Advisory Council (WPAC). At Peace Point (within Wood Buffalo National Park), the Peace River has a drainage area of 293,000 $km^2$ and a mean annual flow of 68,200,000 $m^3$ (AEW, 2011a).

Almost 160,000 people live within the Alberta portion of the Peace River Watershed (Alberta Municipal Affairs, 2010) as shown in **Table 1**. More than half of those people (88,000) live in urban centers, of which the City of Grande Prairie is the largest with a population of just over 50,000. Another 57,000 live in rural municipalities – including hamlets – which attest to the agricultural endeavours within the watershed. More than 12,000 First Nations people live on reserves, and another 2,200 Métis people live on Settlements within the watershed.

As the boundaries for the rural municipalities do not, necessarily, follow the sub-basin boundaries, they have been arbitrarily included in the sub-basin where their head office is located.

The Peace River watershed includes an extensive agricultural region that stretches from the City of Grande Prairie in the south to the Town of Fort Vermilion to the north. Cereal crops, oil seeds, peas, tame hay and forage (e.g., alfalfa, timothy and clover) are some of the primary crops grown. Livestock farming includes cattle, bison, elk and some sheep. Apiculture is also prominent in the Peace Region, with the Town of Falher claiming to be the 'Honey Capital of Canada' and boasting the world's largest bee. Besides agriculture, oil and gas and forestry are major economic drivers within the Peace River Watershed.

## 1.2 The Importance of Healthy Drinking Water

People all over the world share a common need for clean drinking water supplies. In fact, a substantial part of the world's population, in high-income, middle-income and low-income countries alike, rely on small community water supplies (WHO, 2011). Accessibility of clean or 'healthy' drinking water is an important factor in maintaining a healthy population. Contamination by infectious agents or chemicals can cause mild to severe illness and even death. Protecting water sources and minimizing exposure to contaminated water sources are important parts of environmental health.

In Canada, the responsibility for making sure drinking water supplies are safe is shared between the provincial, territorial, federal and municipal governments. The day-to-day responsibility of providing safe drinking water to the public generally rests with the provinces and territories, while municipalities

usually oversee the day-to-day operations of the treatment facilities. Individuals who take their drinking water from groundwater (wells) or surface water capture (dugouts, ponds or lakes) may be responsible for ensuring the water quality. As users and consumers of water we all must take responsibility in protecting our water supply sources. Prevention of contamination is easier and cheaper than curing illness.

## 1.3 Purpose of the Report

The Mighty Peace Watershed Alliance Society (MPWA) is a Watershed Planning and Advisory Council (WPAC) established under Alberta's *Water for Life Strategy*, and is a not-for-profit organization. The MPWA is committed to achieving and implementing the 3 goals of the strategy:

1. Safe, secure drinking water supply;
2. Healthy aquatic ecosystems; and
3. Reliable quality water supplies for a sustainable economy.

In order to provide safe, secure drinking water supplies as stated under Goal 1 of the *Water for Life* Strategy, a thorough understanding of drinking water sources and their end-users is required. This is the first step in assessing risks to drinking water supply, both in terms of the factors affecting drinking water quantity and drinking water quality. Understanding current and future demands, risks, and protection measures is critical in formulating a strategy for drinking water management in the future.

Additionally, the MPWA intends to complete a state of the watershed (SoW) report for the Peace River watershed within Alberta, as is intended for all the major river basins in Alberta, under the *Water for Life* Strategy. Drinking water and the associated risks and management strategies form a key component of such reports, as these issues lie at the interface between the human and natural environments within a watershed.

The MPWA has engaged *Aqua*lity Environmental Consulting Ltd. to develop a report on the state of drinking water within the Peace River Watershed. The objectives of the report are to:

- Determine current drinking water sources within the watershed;
- Determine the type and level of drinking and wastewater treatment within the watershed;
- Determine the status of drinking water and wastewater infrastructure within the watershed, including current and future;
- Identify information and data gaps on the supply of drinking water in the watershed; and,
- Provide a document that may be of value to residents, various governmental agencies, and the Mighty Peace Watershed Alliance in managing drinking water supplies and quality, as well as related endeavors such as the preparation of a State of the Watershed report and Watershed Management Plan.

## 1.4 Scope of the Report

The scope of the report is limited to the Peace River Watershed within the Province of Alberta and includes the following information, as available:

- Geographic location (text and map format) and statistics on current drinking water sources for rural and urban municipalities, Métis Settlements, First Nation Reserves, industry (e.g. work camps) and private well-owners;
- Delivery systems, networks and water co-ops – current capacity, infrastructure gaps, future needs, funding mechanisms (government, user fees, full cost accounting, operation & capital cost planning);
- Type/level of treatment of drinking water and wastewater (including wastewater management practices of municipal, industry and private landowners);
- Regulatory agencies and programs, drinking water guidelines and standards, testing facilities;
- Drinking water issues (future growth and available supply including potential future sources of potable water, contaminants, treatment concerns, and other issues pertinent to the state of drinking water in the Peace Watershed);
- Information gaps;
- Conclusion – should identify where current or future drinking water stress points may occur or where data gaps should be filled and how. Emphasis should be on how this information is relevant to the board and its future work;
- List of key resources for further information; and
- Bibliography of all data sources.