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Boat Use Study

Gull Lake, Alberta

Presented to

Ms. Jacqueline Penn
A.D. Williams Engineering Inc.

REVISION INDEX

ECOMARK Project No.: ADWIL-08504-15451.00-0					
B	October 14, 2008	Final	AH	AH	MP
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Rev	**Date**	**Description**	**Prepared**	**Checked**	**Approved**

LETTER OF TRANSMITTAL

October 14, 2008 Our Project Number: ADWIL-08504-15451.00-0

Ms. Jacqueline Penn
A.D. Williams Engineering Inc.
210, 7240 Johnstone Drive
Red Deer, Alberta, T4P 3Y6

Dear Ms. Penn,

Re: Boat Use Study
Gull Lake, Alberta

We are pleased to present the above referenced Boat Use Study Report (Report) for your benefit and use in evaluating potential impacts to increase boat use on Gull Lake, Alberta. This Report is based on a review of relevant literature and boat use survey conducted on August 2, 2008.

The opinions expressed in this Report are solely those of Ecomark Ltd. This Report is furnished in our capacity as consultants to A.D. Williams Engineering Inc. (Client) for the project described in this Report and do not necessarily reflect the viewpoint of the Client. The Report is written for the benefit and use of the Client, Frank Wilson, Lacombe County, Alberta Environment, Alberta Sustainable Resource Development, Fisheries and Oceans Canada (Parties) only, and may only be relied upon by the Client and Parties in connection with the Boat Use Study. Conditions assessed are valid to the date of visual assessment and limited by the information that was shared by the third parties involved. Liability is limited to the invoiced amount for the Report. While every effort was made to confirm that the data collected from third parties is factual, complete, and accurate, Ecomark Ltd. makes no guarantees or warranties whatsoever with respect to such data.

Yours sincerely,

Alicia Hamm, P. Biol. **Professional Seal**

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EXECUTIVE SUMMARY

At the request of Ms. Jacqueline Penn of A.D. Williams Engineering Inc., Ecomark Ltd. was retained to perform a boat use study on Gull Lake, Alberta. The purpose of the study was to identify and evaluate potential impacts of increase boat use on Gull Lake. The study was based on a review of relevant literature and a boat use survey conducted August 2, 2008.

Boat use is considerably lower in Gull Lake when compared to other Central Alberta lakes. A review of relevant literature and the boat use survey indicates that current boat concentration in Gull Lake falls within a semi-primitive setting. Based on the reasonable boating capacity coefficients, average boat use can increase by over 100 boats in Gull Lake and be situated within the range of a rural natural setting. Average boat use can increase by over 200 boats and be situated within a rural developed setting. The proposed development is not expected to contribute more than 200 additional boats to the current boat concentration or cause Gull Lake to exceed a rural developed setting.

The opinions expressed in this Report are solely those of Ecomark Ltd. This Report is furnished in our capacity as consultants to A.D. Williams Engineering Inc. (Client) for the project described in this Report and do not necessarily reflect the viewpoint of the Client. The Report is written for the benefit and use of the Client, Frank Wilson, Lacombe County, Alberta Environment, Alberta Sustainable Resource Development, and Fisheries and Oceans Canada (Parties) and may only be relied upon by the Client and Parties, in connection with the boat use study. Conditions assessed are valid to the date of visual assessment and limited by the information that was shared by the third parties involved. Financial liability is limited to the invoiced amount of the report. While every effort is made to confirm that the data collected from third parties is factual, complete and accurate, Ecomark Ltd. makes no guarantees or warranties whatsoever with respect to such data.

1 INTRODUCTION

1.1 Scope

At the request of Jacqueline Penn of A.D. Williams Engineering Inc., Ecomark Ltd. was retained to perform a boat use study on Gull Lake, Alberta. The purpose of the study was to identify and evaluate any potential impacts increased boat use would have on Gull Lake. The study was based on a review of relevant literature and a boat use survey conducted on August 2, 2008.

1.2 Development Project Description

It is proposed that Section 1-041-01-W5M and portion of S ½-12-041-01-W5M, Gull Lake, Alberta be converted into an 18-hole public golf course, driving range, pro-shop, restaurant, 2200 Bare Land Condo lots and 194 daily rental lots along with an inland marina, public beach and picnic areas. The proposed inland marina may provide parking facilities for over 500 boats.

1.3 Study Area

The subject property is located along the western shoreline of Gull Lake, Alberta. The total area of the proposed development is approximately 300.9 hectares (743.6 acres). The subject property is presently cultivated agricultural land with temporary wetlands, hedgerows and forested areas, sedge meadows, and a shoreline along Gull Lake.

Gull Lake is located 12 kilometers west of Lacombe, Alberta and 30 kilometers northwest of Red Deer, Alberta within Lacombe County. Gull Lake is a shallow, mesotrophic lake with moderate nutrient levels that is oriented in the northwest to southeast direction (O'Leary *et al.*, 1995). Gull Lake has a total surface area of 80.6 square kilometers and a drainage basin of 206 square kilometers. The mean water depth is 5.4 meters and the maximum water depth is 8 meters (Atlas of Alberta Lakes, 2005).

2 METHODS

A review of relevant literature was conducted to identify current boat use in Gull Lake and to identify applicable management tools for water recreation. A boat use survey was also conducted during the Saturday of the August Long Weekend at two popular boat launches in Gull Lake: Parkland Beach and Aspen Beach Provincial Park. Boats launched into Gull Lake were counted to estimate boat use in Gull Lake. Boats not in use, including boats in marinas, boat lifts, and boats onshore, were also noted.

3 RESULTS

3.1 Previous Studies

On September 2, 2007, Alberta Environment conducted an aerial boat use survey of Gull Lake to determine the total number of boats actively using Gull Lake. Alberta Environment identified 94 boats actively using Gull Lake at the time of the survey. In comparison to the total useable boating area of Gull Lake, it was

determined a concentration of 117.8 acres per boat (Alberta Environment, 2008). Another survey conducted over the 2008 July Long Weekend indicated similar results (Thrussell, 2008, Pers. Comm.).

The United States Bureau of Reclamation has developed a Water Recreational Opportunity Spectrum (WROS) to evaluate water-based recreational opportunities and to manage boat use. WROS identifies six classes of water-based recreational opportunities depending on location, activities, and experiences. The six setting classes include: urban, suburban, rural developed, rural natural, semi-primitive, and primitive (Haas *et al.*, 2004). A summary of each classification is summarized in Table 1.

Using the WROS classification system, Alberta Environment classified Gull Lake as a semi-primitive setting based on boat use. Gull Lake boat use was considerably lower than Pine Lake and Sylvan Lake, which were classified as urban and rural developed settings, respectively (Alberta Environment, 2008).

Table 1: Generalized Description of WROS Recreational Settings Compiled from Haas et al., 2004.

WROS Class	WROS Class Description
Urban Setting	- Extensively developed, populated cities, and metropolitan spacing where virtually the entire landscape contains human built structures. - Municipal, industrial, commercial, and residential land uses dominate and the sights, sounds, and smells are typical of a city environment. - Natural features found in parks, commercial courtyards, streetscapes, river ways, residential gardens, or landscaping. - Water resources are highly channelized, manipulated or altered. - Great deal of management presence (e.g. Personnel, rules, facilities, signs, services, conveniences, and security).
Suburban Setting	- Found on the fringe of the urban area. - The built environment tends to be commercial and residential and sights, sounds, and smells of development and built structures are widespread. - Natural features found in community parks, greenways, trails, open space, natural areas, wetlands, and estuaries. - Water resources are highly channelized, manipulated or altered. - Management is prevalent.
Rural Developed Setting	- Situated beyond a metropolitan area and the suburban ring of development. - Areas contain working farms and ranches, towns and primary road networks are common. - Development will be prevalent and common, yet the setting has a pastoral sense because of interspersing forests, water resources, hills, valleys, canyons, wetlands, open spaces and agricultural uses. - Natural appearing shoreline edges are common, although various water control structures are common. - Management is prevalent but not as extensive as in an urban setting.
Rural Natural Setting	- Considerable distance from metropolitan areas and communities. - Natural features are predominant on the landscape and development is occasional or infrequent. - Agriculture, tourism and outdoor recreation are primary industries. - The sights, sounds, and smells of development are infrequent and water resources are bordered by natural settings. - Management is occasionally noticeable in the form of patrols, facilities, signage, conveniences and full services. - Visitors desire a sense of tranquility and escape from their daily routine. - Examples include areas with unpaved roads, small cabins, single residences, farms and ranches, rustic campgrounds, provincial parks, small stores and fuel services and areas surrounded by large expanses of public lands and waters.
Semi Primitive Setting	- Large expanse of natural resources far from any city or metropolitan area and a considerable distance from small communities, subdivisions, or developments. - Natural resources dominate the landscape. - Development is minor and the sights and sounds of human activity are few. - Water resources are often within large expanses of public lands and waters. - Facilities are rustic and blend well into the setting. - Resource protection is very important.

WROS Class	WROS Class Description
	- Visitors desire a sense of tranquility and escape from their daily routine. - Examples include large expanses of provincial or federal parks and waters that are commonly designed as a wild or scenic river, wilderness, backcountry lake, headwater, marine reserve, or protected area.
Primitive Setting	- Very large expanse of natural resources very far from development and settlement. - Any sights, sounds, or smells of human activity are rare and minor. - The water resources and shorelines appear natural and show very little evidence of past human activity. - Management relies on visitor cooperation and stewardship. - A sense of remoteness, wildness, solitude and self-reliance is dominant among visitors. - There are no visitor comforts or conveniences. - Examples include very large expanses of federal parks and waters designated as a wild or scenic river, wilderness, backcountry lake, headwater, marine reserve or internationally protected area.

3.2 Boat Use Survey

A boat use survey was conducted at two popular boat launches in Gull Lake: Parkland Beach and Aspen Beach Provincial Park between 7:00 AM and 4:00 PM. Parkland Beach consisted of a public and private marina. Aspen Beach Provincial Park consists of a day use area, beach and campground. At the time of the survey, 160 boats were parked in the marina at Parkland Beach, but only 13 boats accessed Gull Lake. Similarly, 28 boats were parked in the parking lots of Aspen Beach Provincial Park, but only 21 boats accessed Gull Lake. The results of the boat use survey at the two boat launches are summarized in Table 2 and Table 3.

Table 2: Results of Boat Use Survey for Parkland Beach

Time	Type of Watercraft				
	Ski Boat & Cruisers	Fishing Boats	Personal Watercrafts	Other Boats	Total
7 AM to 10 AM	0	1	0	0	1
10 AM to 1 PM	7	0	1	1	9
1 PM to 4 PM	2	2	0	0	4
Total Boats Launched = 14					
Total Boats Parked = 160					

Table 3: Results of Boat Use Survey for Aspen Beach Provincial Park

Time	Type of Watercraft				
	Ski Boat & Cruisers	Fishing Boats	Personal Watercrafts	Other Boats	Total
7 AM to 10 AM	2	2	0	1	5
10 AM to 1 PM	5	2	3	0	10
1 PM to 4 PM	4	1	0	1	6
Total Boats Launched = 21					
Total Boats Parked = 28					

4 DISCUSSION

4.1 Boat Use

The amount of boats that Gull Lake can accommodate at one time can be estimated using reasonable boating capacity coefficients. Following analysis of ecological integrity, level of public support, effects on recreational experiences, and management suitability, the United States Bureau of Reclamation determined reasonable recreational boating coefficients for each WROS class (Haas et al., 2004). The ranges of boating capacity coefficients are summarized in Table 3.

Table 4: Ranges of Reasonable Boating Capacity Coefficients Compiled from Haas et al., 2004.

WROS Class	Range of Boating Capacity Coefficients	
	Low end of range	High end of range
Urban	1 acre/boat	10 acres/boat
Suburban	10 acres/boat	20 acres/boat
Rural Developed	20 acres/boat	50 acres/boat
Rural Natural	50 acres/boat	110 acres/boat
Semi Primitive	110 acres/boat	480 acres/boat
Primitive	480 acres/boat	3,200 acres/boat

Boat concentrations are considerably lower in Gull Lake in comparison to other Central Alberta lakes. Currently, boat concentration in Gull Lake averages 117.8 acres per boat, placing it within the semi-primitive setting. Pine Lake and Sylvan Lake, in contrast, are defined as rural developed setting and rural natural setting based on their respective average boat use.

An increase in average boat use will likely cause Gull Lake to move from a semi-primitive setting to a rural natural setting and potentially a rural developed setting. Arguably, since current boat use is already situated at the low end of its range, Gull Lake probably resembles a rural natural setting on hot days during the summer months. Due to its close proximity to Edmonton, Red Deer, and Calgary, Gull Lake is likely better suited to a rural developed setting or rural natural setting based on the generalized descriptions in Table 1.

The boat use survey indicates that not all boats parked in marina stalls or parking lots actively use Gull Lake at the same time. Only 18% of the total number of boats observed in the marina stalls and parking lots accessed Gull Lake at the time of the survey. The correlation between average boat use and the current number of boat parking areas in Gull Lake could not be reasonably determined from a review of relevant literature or boat use survey. The proposed development will increase average boat use in Gull Lake, but the exact number is unknown.

5 CONCLUSION

Boat use is considerably lower in Gull Lake in comparison to other Central Alberta lakes. A review of relevant literature and the boat use survey indicates that current boat concentration in Gull Lake falls within a semi-primitive setting. Based on the reasonable boating capacity coefficients, average boat use can increase by

over 100 boats in Gull Lake and be situated within the range of a rural natural setting. Average boat use can increase by over 200 boats and be situated within a rural developed setting. The proposed development is not expected to contribute more than 200 additional boats to the current boat concentration or cause Gull Lake to exceed a rural developed setting.

References

Alberta Environment. July 29, 2008. Three Lake Aerial Boat Survey: Sylvan Lake, Gull Lake and Pine Lake. September 2, 2007. Labour Day Weekend. Powerpoint presentation provided by Douglas Thrussell.

Atlas of Alberta Lakes. Website accessed July 28, 2008. http://sunsite.ualberta.ca/Projects/Alberta-Lakes/

Haas, G., Aaukerman, R., Lovejoy, V., and Welch, D. July 2004. Water Recreation Opportunity Spectrum (WROS) Users' Guidebook. United States Department of the Interior, Bureau of Reclamation. Office of Program and Policy Services, Denver Federal Center, Lakewood, Colorado.

O'Leary, D., Schultz, R. and J. Bentz. March 1995. Shoreline Habitat Assessment of Gull Lake, Alberta. GEOWEST Environmental Consultants Ltd. Prepared for Fish and Wildlife Division (Red Deer), Land Information Services Division, and Alberta Environmental Protection.

Thrussell, Douglas. Alberta Environment. Environmental Planner. July 29, 2008. Personal Communication.

Appendix 1: Qualifications and Information Pertaining to the Environmental Consultants

Name of Firm: Ecomark Ltd.

Address: 100 – 14964 – 121A Avenue, Edmonton, Alberta T5V 1A3

Phone: (780) 444–0706

Fax: 1–866–337–8631

Date Established: January 11, 2000

Insurance Coverage:

- Professional Errors & Omissions - $2,000,000
- Commercial General Liability - $1,000,000
- WCB Account

Safety Training: All professional staff at Ecomark has appropriate safety training in WHIMS, H_2S Alive, TDG, First Aid and Ground Disturbance Practices.

We excel in assessments, reclamation and remediation, and corporate environmental management. Our experience covers phase 1, 2, and 3 environmental assessments and environmental audits on the widest variety of industrial/commercial and residential properties and companies. We also have extensive facility experience, from scouting potential routes and facilities, through audit of existing facilities, to final reclamation and restoration of disturbed habitats.

One of our key strengths is corporate (government) liability assessments. We evaluate the environmental liability incumbent to a site or sites. We have been relied on by major corporations to place a monetary value on the environmental liability of assets being acquired, disposed of, or maintained.

Our staff provides Ecomark with 28 years of individual professional experience. We have appropriate professional errors and omission (E&O) insurance, contractors general liability (CGL) insurance, and Worker's Compensation. We have also attained Small Employer Certificate of Recognition (SECOR) safety status. A professional biologist, professional chemist, professional engineer, or professional geologist warrants all our work. We do quality, fully warranted assessments that all parties can understand.

Ecomark Ltd. Projects and Experience

Phase 1 Environmental Assessments

Phase 1 environmental assessments throughout Canada

Phase 2 Environmental Assessments

Phase 2 environmental assessments throughout Canada

Tier 2 risk assessments, Airdrie, Sundre, and North Garrington, Alberta

Phase 3 and 4 Environmental Assessments

Oilfields reclamation in Devon, Bonnie Glen and Redwater

Oil lease cleanups

Class 3 railway derailment cleanup and complete railway line abandonment

Diesel spill remediation

Fuel tank removals and cleanups

Underground storage tank remediation

Contaminated soil cleanups

Landfill reclamations

Salt spill weeping tile design and geotechnical assessment

Bioremediation, audit, waste cleanup, and process redesign

Erith River crossings reclamation

Peat bog sewage treatment field reclamation

Grading, cleanup, and reclamation of Mountain Park Loop

Pipeline crossing inspection, creek monitoring, and reclamation

Native grass and forbs species research for boreal forest reclamation

Stabilization of a mineral spring

Mitigation measures and further recommendations for rare native grasslands

Constructed wetland, survey, plan, construction

Wastewater tertiary treatment

Mould Assessments

Mould assessments

Indoor air quality assessments

Assessments – Reports, Acquisition, Habitat, Hazard, Environmental Impact and Others

Corporate environmental acquisition assessments

Chemical/brownfield site assessments

Federal and provincial environmental impact assessments

Health risk impact assessment, Health Board equivalent of an EIA

Environmental compliance audit for health facilities

Commercial environmental audits and technical reviews

Hazard identification assessments for industry, developers, and municipalities

Complete biophysical assessments, including wetland and aquatic assessments Compost research and field application trials

Nutrient management in intensive livestock operations

Effects on nitrogen leaching in soils with the application of bedding

Effects of phosphogypsum on compost

Waste operations

Route selection and design of river crossings for pipelines

Technology evaluations for secondary off-gas treatment, cement kiln

Scouting, application, and approvals for linear development projects

Medicine Lodge Loop environmental assessment

Environmental field report for Cheviot and Mountain Park Railway

Stormwater outflow inspection and installation, Atim Creek

Culvert installation under Atim Creek CN Right-Of-Way

Aquatic inspection in Athabasca and North Saskatchewan drainages

Fisheries monitoring studies and research and creek fisheries assessments

Transalta fish recovery tank for Lake Wabamun

Dredging impact literature search and sediment survey, Lake Wabamun

Rare plant studies throughout western Canada, including a study covering 1.8 million hectares in northwestern Saskatchewan, and smaller studies in BC and Alberta

Technology, composting alternatives, fly ash for road building material

Air, Water, Soil and Biomonitoring

Groundwater monitoring

Soil monitoring

Vegetation, lichen, and agricultural field biomonitoring

Establishment of biomonitoring plots complete with FCIR and Air Photo interpretation

Indoor air quality monitoring

Environmental Systems Development

Landfill design and development

Establishment of bioremediation, composting, and recycling facilities

Environmental training module and delivery

Environmental procedures manual for North American Construction Group

EUB waste module manual and delivery

Northern Alberta compost brochure and manual

Building operator training program waste module

Habitat restoration and environmental aspects of linear development

Fisheries training (linear development)

Cleanup of upstream oilfield sites for World Bank Russia training program

Training for Alberta Onsite Waste Water training program

Waste management system development

Waste module for downstream oilfield operations in Venezuela

Waste audit report on waste resource management at Northlands Park

Management of animal bedding from a race track by diversion from landfill and use in composting or incorporation into farm fields

Compost marketing study for the University of Alberta

Sewage field testing

Intensive livestock composting seminar for the County of Lamont

Assessment of waste dewatering market for Western Canada

Waste audit and waste minimization implementation

Development of integrated waste management facility for Fero, Yukon

Environmental management course, waste management, construction, and operations for Russia World Bank

Development of waste management facility for Margao, India

International hazardous waste management pricing survey

Operational enhancement of community septic system and design of new infiltration field

Establishment of hazardous waste transfer station, including market analysis

Assistance in establishing bioremediation market

Assistance and rewrite of production unit subscription and business plan

Assistance on CADR grinding technology

Assessment of proposals for PCB regulatory framework for Colombia

Historical environmental review for Paintearth Resource Recovery Centre, Coronation, Alberta

Energy management plan

Development of micropower interconnection on-line manual

Installation of monitoring and demonstration system for solar heating project

Applications, Licenses, and Regulatory Assistance

Facility approval applications

Integrated municipal waste facility Board of Health application

Industrial application for waste handling facilities

Waste management applications

AEUB Guide 58 applications

AEUB Guide 55 support

Water well application for facility water supply system

Redefinition of hazardous waste for Canadian Environmental Protection Act

Assessment of regulations for importation of hauling waste from other countries

Development of the Medicine Hat Waste Management Facility, Petro-Canada

Development of the Paintearth Resource Recovery Centre

Development of commercial land for Wetaskiwin, Alberta