APPENDICES

Appendix 1: Project Consultants

NAME	AFFILIATION
Bilawchuk, Steve	ACI Acoustical Consultants Inc.
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Lapointe, April	Millennium EMS Solutions Ltd.
McCoy, Dane	Millennium EMS Solutions Ltd.
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McNamee, Peter	Hatfield Consultants Ltd.
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Tischer, Jennifer	FMA Heritage Resources Consultants Inc.
Van Der Vinne, Gary	Northwest Hydraulic Consultants Ltd.
Wuetherick, Evelyn	Millennium EMS Solutions Ltd.
Young, Kim	Millennium EMS Solutions Ltd.

Appendix 2: Glossary and Acronyms

AAAQOs	Alberta Ambient Air Quality Objectives
AENV	Alberta Environment
API	American Petroleum Institute
ATC	Athabasca Tribal Council
AVI	Alberta Vegetation Inventory
bbls/day	Barrels per day, usually of oil unless explicitly stated otherwise
BFW	Boiler Feed Water
bpd	Barrels per day, usually Oil implied unless explicitly stated otherwise
BS&W	Basic Sediments and Water
C&R	Conservation and Reclamation
CDWOG	Canadian Drinking Water Quality Guidelines
CEMA	Cumulative Effects Management Association
CPF	Central Processing Facility
CPP	Caribou Protection Plan
CSOR	Cumulative Steam to Oil Ratio – an economic indicator used to
	monitor unit volumes of steam injected per unit volume of oil
	produced (no units as it is a ratio) This ratio can be calculated per
	well or over a group of wells
CTL	Coniferous Timber Licence
CWE	Cold Water Equivalent
CWS	Canada Wide Standards
DBA	Decibel weighted on A scale
DOW	Dangerous Oilfield Waste
Drld & ABD	Drilled and Abandoned wells
EC	Environment Canada
EPEA	Environment Protection and Enhancement Act
ERCB	Energy Resources Conservation Board
ERP	Emergency Response Plan
EUB	Energy and Utilities Board, former name for ERCB
FMA	Forest Management Agreement
FMIS	Fisheries Management Information System
FWKO	Free Water Knock Out
HRIA	Historical Resources Impact Assessment
HSE	Health Safety and Environment
IGF	Induced Gas Flotation
IRC	Industry Relations Corporation
ISOR OR iSOR	Instantaneous Steam to Oil Ratio – similar to CSOR except that it is
	calculated over a finite period of time - usually a month e.g. amount
	of steam injected in a month divided by the amount of oil produced in
	a month. This ratio can be calculated per well or over a group of
	wells.
kPaa	kilopascals (absolute), unit for pressure measurement
kPag	kilopascals (gauge), unit for pressure measurement
LEL	Lower Explosive Limit
LOC	Licence of Occupation
LSA	Local Study Area

m3/day	Cubic m per day, usually of oil unless explicitly stated otherwise
MEMS	Millennium EMS Consultants Ltd.
MMBBLS	Million barrels, usually for Oil unless explicitly stated otherwise
MSL	Mineral Surface Lease
MWD	Measurement while Drilling
NCG	Non-condensable Gas, in Sunshine's case it will be the flue gas from
	Steam Generation Facilities
ORIN	or millions of barrels
ORF	Oil Removal Filter
OSE	Oil Sands Exploration Program
OTSG	Once Through Steam Generator
PA	Project Area which sustains 10,000 barrels per day of Oil for 25 years
PDA	Project Development Area - the initial area for the pilot and to raise
	production to 10,000 barrels per day of Oil
PETREL	Schlumberger software for geological, geophysical, and reservoir
	characterization work
PDF	Process Flow Diagram
PLA	Pipeline Right of Way
PSL	Permissible Sound Levels
RSA	Regional Study Area
SAC	Strong Acid Cation
SAGD	Steam Assisted Gravity Drainage
SOR	Steam to Oil Ratio, see CSOR and ISOR
SRD	Alberta Sustainable Resource Development
Sunshine	Sunshine Oilsands Ltd.
UPS	Uninterrupted Power System
UTM	Universal Transverse Mercator - coordinate system
WBEA	Wood Buffalo Environmental Association
WSC	Water Survey of Canada

Appendix 3 References

Alberta Agriculture and Rural Development. 2008. Agroclimatic Atlas of Alberta. Government of Alberta, Edmonton, Alberta World wide web page. <u>http://www1.agric.gov.ab.ca/\$department/deptdocs.nsf/all/sag6299</u>.

Alberta Caribou Committee (ACC). 2008. Annual population data of woodland caribou herds in Alberta: 2007-2008. http://www.albertacariboucommittee.ca/cariboudata/2007-2008.pdf. Accessed 17 October, 2008.

Alberta Community Development. 2008. Listing of Significant Historical Sites and Areas (March 2008 edition). Historic Resources Management Branch, Alberta Tourism, Parks, Recreation and Culture. Edmonton, Alberta.

Alberta Conservation Association. No Date. Alberta volunteer amphibian monitoring program. Participants manual. Edmonton, Alberta, Canada.

Alberta Energy and Utilities Board (ERCB). 2007. Directive 038 on Noise Control. Calgary, Alberta

Alberta Environment (AENV). 1997. Conservation and Reclamation Guidelines for Alberta. Conservation and Reclamation Information Letter 97-1. 2 pp.

Alberta Environment (AENV). 1999. Surface Water Quality Guidelines for Use in Alberta. Environmental Assurance Division, Science and Standards Branch. 25 pp.

Alberta Environment (AENV). 2000. Code of Practice for Pipelines and Telecommunication Lines Crossing a Waterbody. located at <u>http://www.qp.gov.ab.ca/documents/codes/PIPELINE.CFM</u> (incl. 2001 and 2003 amendments).

Alberta Environment (AENV). 2001. Guide to the Code of Practice for Watercourse Crossings, Including Guidelines for Complying with the Code of Practice.

Alberta Environment (AENV). 2002. Canada-wide Standards for PM & Ozone: status of jurisdictional implementation activities "Alberta". <u>http://www3.gov.ab.ca/env/protenf/standards/cws_participation/publications/PmOzone-JurisdictionalUpdate_April2002.pdf</u>.

Alberta Environment (AENV). 2002. Environmental Protection Guidelines for Oil Production Sites. C&R/IL/02-1. March 2002. Edmonton, AB.

Alberta Environment (AENV). 2003. Air quality model guideline. Prepared by A. Idriss. Science and Standards Branch. <u>http://www3.gov.ab.ca/env/air/airqual/airmodelling.html</u>. 36 pp.

Alberta Environment (AENV). 2003. Focus on wetlands. Alberta Environment, Edmonton, Alberta, Pub No. I/934.

Alberta Environment (AENV). 2003. Groundwater Evaluation Guideline. 28 pages.

Alberta Environment (AENV). 2004. Alberta ambient air quality objectives. http://www3.gov.ab.ca/env/protenf/approvals/factsheets/ABAmbientAirQuality.pdf.

Alberta Environment (AENV). 2005. Alberta Air Emission Standards for Electricity Generation and Alberta Air Emission Guidelines for Electricity Generation. Prepared by Environmental Policy Branch Alberta Environment. December 2005.

Alberta Environment (AENV). 2006. Water Conservation and Allocation Guideline for Oilfield Injection 2006. Edmonton. 60 pages.

Alberta Environment Protection. 1994. Alberta Timber Harvesting Planning and Operating Ground Rules. Pub. No.: Ref. 71. ISBN: 0-86499-919-4. 47 pp. plus appendices.

Alberta Environmental Protection. 1994. Ecological land survey site description manual. Canada/Alberta Partnership Agreement in Forestry Publication. Edmonton, Alberta.

Alberta Government. 2007. A Guide to: Reclamation Criteria for Wellsites and Associated Facilities – 2007 – Forested Lands in the Green Area Update. Alberta Sustainable Resource Development. Edmonton, Alberta. April 2007. 20 pp.

Alberta Infrastructure and Transportation. 1999. Fish habitat manual: guidelines and procedures for watercourse crossings in Alberta. 114 pp. plus app.

Alberta Legislature. 2000. Historical Resources Act. Registered Statutes of Alberta (RSA) 2000.

Alberta Native Plant Council (ANPC). 2006. Plant collection guidelines for researchers, students and consultants. Alberta Native Plant Council. World wide web page (http://www.anpc.ab.ca) accessed February 2007.

Alberta Natural Heritage Information Centre (ANHIC). 2006a. Draft Plant Community Sampling Guidelines. Alberta Environment. Edmonton, Alberta. World wide web page

(http://www.cd.gov.ab.ca/preserving/parks/anhic/ plantcomm_sampling_guidelines.asp) accessed February 2007.

Alberta Sustainable Resource Development (ASRD). 2002. Amphibians of Alberta: Global decline. Accessed 16 October 2008.

http://www.srd.gov.ab.ca/fishwildlife/wildlifeinalberta/amphibiansalberta/globaldecline .aspx.

Alberta Sustainable Resource Development (ASRD). 2005. Status of Alberta Wildlife. Accessed April 2008. <u>http://www.srd.alberta.ca/fishwildlife/status/default.aspx.</u>

Alberta Sustainable Resource Development. 2005. Natural Regions, Subregions and Natural History Regions, Subregions: A Classification of Protected Areas Management. Report 2. Edmonton, Alberta.

Alberta Sustainable Resource Development. 2006. Fish Conservation Strategy for Alberta 2006-2010.

Alberta Water Resources Commission. 1993a. Alberta's peatlands and non-settled area wetlands: a background report. Alberta Environmental Protection. Edmonton, Alberta.

Alberta Woodland Caribou Recovery Team. 2005. Alberta woodland caribou recovery plan 2004/05-2013/14. Alberta Sustainable Resource Development, Fish and Wildlife Division, Alberta Species at Risk Recovery Plan No. 4. Edmonton, Alberta, Canada.

Andriashek, L.D. 2001. Quaternary Stratigraphy of the Buried Birch and Willow Bedrock Channels, NE Alberta. EUB/AGS Earth Sciences Report 2000-15

Andriashek, L.D. and J. Meeks, 2001. Bedrock Topography, Drift Thickness and Buried Channels, Northeast Alberta. EUB/AGS 2000-01.

Andriashek, L.D. and N. Atkinson, 2007. Buried Channels and Glacial Drift Aquifers in the Fort McMurray Region, Northeast Alberta. EUB/AGS Earth Sciences Report 2007-01.

ANHIC. 2006d. List of All Lichen Elements. Alberta Environment. Edmonton, Alberta. World wide web page (http://www.cd.gov.ab.ca/preserving/parks/anhic/docs/lichen_list.pdf).

ANHIC. 2006b. List of all vascular plant elements. Alberta Community Development, Parks and Protected Areas Division. World wide web page (http://www.cd. gov.ab.ca/preserving/parks/anhic/plant_element_list.asp) accessed February 2007.

ANHIC. 2006c. List of all bryophyte elements. Alberta Community Development, Parks and Protected Areas Division. World wide web page (http://www.cd. gov.ab.ca/preserving/parks/anhic/plant_element_list.asp) accessed February 2007.

ANPC. 2000a. Guidelines for rare plant surveys. Alberta Native Plant Council. World wide web page (http://www.anpc.ab.ca) accessed February 2007.

Arora, D. 1986. Mushrooms demystified. Second Edition. Ten Speed Press, Berkley, California.

ASIC (Alberta Soil Information Centre). 2001. AGRASID 3.0: Agricultural Region of Alberta Soil Inventory Database (Version 3.0). Edited by J.A. Brierley, T.C. Martin, and D.J. Spiess. Agriculture and Agri-Food Canada, Research Branch; Alberta Agriculture, Food and Rural Development, Conservation and Development Branch. Available at URL: www1.agric.gov.ab.ca/\$department/deptdocs.nsf/all/sag3249.

Athabasca Oil Sands Corp. 2008. Dover Central Pilot Project Application.

AXYS Environmental Consulting Ltd. (AXYS). 1999. Petro-Canada MacKay River Project environmental assessment: Supplemental surveys. Prepared for Petro-Canada Oil and Gas. Prepared by AXYS Environmental Consulting Ltd., Calgary, Alberta, Canada.

AXYS Environmental Consulting Ltd. (AXYS). 2001a. Application for the approval of the Surmont In-Situ Oil Sands Project. Technical Appendix 6: Supplemental wildlife surveys. Prepared for Gulf Canada Resources Limited. Prepared by AXYS Environmental Consulting Ltd., Calgary, Alberta, Canada.

AXYS Environmental Consulting Ltd. (AXYS). 2001b. Application for the approval of the Fort Hills Oil Sands Project . Prepared for True North Energy Inc. Prepared by AXYS Environmental Consulting Ltd., Calgary, Alberta, Canada.

Banfield, A.W.F. 1974. The mammals of Canada. National Museum of Canada. University of Toronto Press, Toronto, Ontario, Canada.

Bazin, R. Wildlife Biologist. (Personal Communication) Canadian Wildlife Service, Winnipeg, Manitoba, Canada.

Bazin, R. and F.B. Baldwin. 2007. Canadian Wildlife Service standardized protocol for the survey of yellow rails (Coturnicops noveboracensis) in the prairie and northern region, v1. Canadian Wildlife Service, Winnipeg, Manitoba, Canada.

BC MOE. 2001. Ambient water quality guidelines for manganese.

BC MOE. 2001. British Columbia Approved Water Quality Guidelines (Criteria). Water, Air, and Climate Change Branch. August 2001 update of the 1998 version.

BC MOE. 2003. Ambient water quality guidelines for boron.

Beckingham, J.D. and J.H. Archibald. 1996. Field guide to ecosites of Northern Alberta. Natural Resources Canada, Canadian Forest Service, Northwest Region, Northern Forestry Center, Edmonton, Alberta. Special Report 5.

Bibby, C.J., N.D. Burgess and D.A. Hill. 1993. Bird Census Techniques. Academic Press.

Bondrup-Nielsen, S. 1978. Vocalizations, nesting, and habitat preferences of the boreal owl (Aegolius funereus) in North America. M.Sc. thesis, Univ. Toronto, Ontario, Canada.

Borden, C. 1954. A uniform site designation scheme for Canada. Anthropology in British Columbia, Vol. 4: 44 - 48.

Boreal Caribou Committee. 2001. Strategic plan and industrial guidelines for boreal caribou ranges in northern Alberta. Boreal Caribou Committee. Edmonton, Alberta, Canada.

Bothe, R.A., 1981. Lake evaporation in Alberta, 1912 to 1980. Water Resources Management Service, Technical Services Division, Hydrology Branch. Edmonton, Alberta.

Brierley, J.A., B.D. Walker, C.J. Thomas, P.E. Smith, and M.D. Bock. 2006. Alberta soil names file (Generation 3) user's handbook. Agriculture and Agri-Food Canada, Research Branch, Edmonton. 140 pp. Available at URL: www1.agric.gov.ab.ca/\$department/deptdocs.nsf/all/sag10989.

British Columbia Ministry of Environment. 2006. A compendium of working water quality guidelines for British Columbia. 35 pp.

Brodo, I.M., S.D. Sharnoff, and S. Sharnoff. 2001. Lichens of North America. Yale University Press, Connecticut.

Brusnyk, L.M and D.A. Westworth. 1986. Ungulate monitoring studies in the Cold Lake project area for Esso Resources Canada Ltd. Prepared for Esso Resources Canada by D.A. Westworth and Associates Ltd. Edmonton, Alberta, Canada.

Buskirk, S.W., and S.O. Powell. 1994. Habitat ecology of fisher and american marten. Pages 283-296 in S.W. Buskirk, A. Harestad, M. Raphael and R. Powell, editors.

Marten, sables and fishers: biology and conservation. Cornell University Press, Ithaca, New York, USA.

Cameron, R.D., D.J. Reed, J.R. Dau and W.T. Smith. 1992. Redistribution of calving caribou in response to oil field development on the arctic slope of Alaska. Arctic 45(4): 338-342.

Canadian Council of Ministers of the Environment (CCME). 1999. Canadian Environmental Quality Guidelines. Winnipeg, MB: CCME.

Caughley, G. 1974. Bias in aerial surveys. Journal of Wildlife Management 38:921-933.

Caughley, G. and J. Goddard. 1972. Improving the estimate for inaccurate censuses. Journal of Wildlife Management 36:135-140.

CCME 2006. Canadian Environmental Quality Guidelines. Canadian Council of Ministers of the Environment. Environment Canada. Hull, Quebec, 1999, updated July 2006.

CEMA (Cumulative Environmental Management Association). 2006. Land capability classification system for forest ecosystems in the Oil Sands; Volume 1: field manual for land capability determination (third edition). CEMA. 53 pp plus appendices.

Committee on the Status of Endangered Wildlife in Canada (COSEWIC). 2008. Status of Species. <u>http://www.cosewic.gc.ca/eng/sct5/index_e.cfm</u>. Accessed April 2008.

Coote, D.R. and W.W. Pettapiece. 1989. Wind erosion risk; Alberta. Agriculture Canada, Research Branch, Ottawa. Contribution No. 87-08; with map.

Cumulative Environmental Management Association (CEMA). 2001. Sustainable Ecosystem Working Group Terms of Reference and Work Plan. August 2001. Fort McMurray, Alberta, Canada.

Curatolo, J.A. and S.M. Murphy. 1986. The effects of pipelines, roads and traffic on the movements of caribou, Rangifer tarandus. Canadian Field-Naturalist 100(2): 218-224.

Deer Creek Energy Limited (DCEL), 2005. Application and Environmental Impact Assessment, Joslyn North Mine Project.

Deer Creek Energy Limited (DCEL), 2007. Joslyn North Mine Project Supplemental Information, Vol. 1, Project Update. Air Quality Section Prepared by AMEC.

Ducks Unlimited Canada (DUC). 2008. Migration station. http://www.ducks.ca/resource/general/wetland/mig2.html. Accessed 17 October 2008. Dunford, J.S. 2003. Woodland caribou-wildfire relationships in northern Alberta. M.Sc. thesis. University of Alberta, Edmonton, Alberta, Canada.

Dussault, C., J.-P. Ouellet, C. Laurian, R. Courtois, M. Poulin, and L. Breton. 2006. Moose movement rates along highways and crossing probability models. Journal of Wildlife Management 71(7): 2338-2345.

Dussault, C., J-P. Ouellet, R. Coutois, J. Huot, L. Breton and H. Jolicoeur. 2005. Linking moose habitat selection to limiting factors. Ecography 28:619-628.

Dyer, S.J. 1999. Movement and distribution of woodland caribou (Rangifer tarandus caribou) in response to industrial development in northeastern Alberta. M.Sc. thesis. University of Alberta, Edmonton, Alberta, Canada.

Dyer, S.J., J.P. O'Neill, S.M. Wasel, and S. Boutin. 2002. Quantifying barrier effects of roads and seismic lines on movements of female woodland caribou in northeastern Alberta. Canadian Journal of Zoology. 80: 839-845.

Dzus, E. 2001. Status of the woodland caribou (Rangifer tarandus caribou) in Alberta. Alberta Environment, Fisheries and Wildlife Management Division, and Alberta Conservation Association, Wildlife Status Report No. 30. Edmonton, Alberta, Canada.

Environment Canada. Canadian Climate Normals 1971-2000. Accessed at <u>http://www.climate.weatheroffice.ec.gc.ca/climate_normals/index_e.html on August 18</u>, 2008.

Environmental Codes of Practice for Steam Electric Power Generation – Construction Phase. Report EPS 1/PG/3, Environment Canada, 1989.

ESWG (Ecological Stratification Working Group). 1995. A national ecological framework for Canada. Agriculture and Agri-Food Canada and Environment Canada, Ottawa. 125 pp. + maps. Revised version (1999) available at URL: sis.agr.gc.ca/cansis/nsdb/ecostrat/intro.html.

Fahrig, L., J. H. Pedlar, S. E. Pope, P. D. Taylor, and J. F. Wegner. 1995. Effect of road traffic on amphibian density. Biological Conservation 73:177-182.

Fanzreb, K.E. 1981. A comparative analysis of territorial mapping and variable-strip transect censusing methods. Studies in Avian Biology 6:164-169.

Fisher, C., and J. Acorn. 1998. Birds of Alberta. Lone Pine Publishing, Edmonton, Alberta, Canada.

Francis, S., R. Anderson, and S. Dyer. 2002. Development of a threshold approach for assessing industrial impacts on woodland caribou in Yukon. Presentation provided at the Assessment and Management of Cumulative Effects Workshop, Whitehorse, Yukon, Canada. March 25-26, 2002.

Garcia, P.F.J., J.M. Constible, P.T. Gregory, and K.W. Larsen. 2004. Natural history of the Canadian toad, Bufo hemiophrys, in the mixed-wood boreal forest of northeastern Alberta. Report to Alberta-Pacific Industries Inc. Athabasca, Alberta, Canada.

Gasaway, W.C., S.D. Dubois, D.J. Reed and S. Harbo. 1986. Estimating moose population parameters from aerial surveys. Alaska Department of Fish and Game. Alaska, USA.

GDC (Geographic Dynamics Corporation) 2008. Vegetation and Wetlands Resource Assessment and Rare Plant Survey Report for the Sunshine Oilsands Ltd. West-Ells SAGD Project Consultant Report #9 in the forSunshine Oilsnads West Ells SAGD Project Application for Approval to the Alberta Energy Resources Conservation Board and Alberta Environment, November 2008.

GDC (Geographic Dynamics Corporation). 2008. West Ells SAGD Project : Vegetation and biodiversity assessment. Prepared for Sunshine Oilsands Ltd. by Geographic Dynamics Corporation, Edmonton, Alberta, Canada.

Golder Associates Ltd. April 2008. Groundwater Monitoring Well Installation and Testing - Grand Rapids Formation, West Ells Project. Draft Technical Memorandum. Prepared for Sunshine Oilsands Ltd. 08-1348-0002.

Golder Associates. 2002. CNRL Horizon Project, Volume VI, Appendix E: Wildlife habitat modelling. Calgary, Alberta, Canada.

Gould, J. 2006. Alberta Natural Heritage Information Centre Tracking and Watch Lists-Vascular Plants, Mosses, Liverworts and Hornworts. Alberta Community Development, Parks and Protected Areas Division, Edmonton, Alberta.

Government of Alberta. 2001. Alberta Regulation 171/2001, Weed Control Act: Weed Regulation. Alberta Queen's Printer, Alberta Government, Edmonton, Alberta.

Government of British Columbia. 2003. Part E: Ambient freshwater and effluent sampling. In: British Columbia Field Sampling Manual. BC Ministry of Water, Land and Air Protection, Government of British Columbia, Victoria, British Columbia.

Gulyas, Gyula. Personal communication, November, 2007. Project Manager, Timberline Natural Resource Group, Vancouver, BC.

Halsey, L.A., and D.H. Vitt. 1996. Alberta Wetland Inventory Standards 2.0. Alberta Sustainable Resource Development, Edmonton, Alberta.

Halsey, L.A., D.H. Vitt, D. Beilman, S. Crow, S. Mehelcic, and R. Wells. 1996. Alberta Wetland Inventory Standards 2.0. Alberta Sustainable Resource Development, Edmonton, Alberta.

Halsey, L.A., D.H. Vitt, D. Beilman, S. Crow, S. Mehelcic, and R. Wells. 2003. Alberta Wetland Inventory Standards Version 2.0. Resource Data Division, Alberta Sustainable Resource Development, Edmonton, Alberta.

Hamilton, I.M., J.L. Skilnick, H. Troughton, A.P. Russell, and G.L. Powell. 1998. Status of the Canadian toad (Bufo hemiophrys) in Alberta. Alberta Environmental Protection, Wildlife Management Division, and the Alberta Conservation Association, Wildlife Status Report No. 12, Edmonton, Alberta, Canada.

Hamilton, W.N, M.C. Price, and C.W. Langenberg (compilers). 1999. Geological map of Alberta. Alberta Geological Survey, Alberta Energy and Utilities Board. Map No. 236; scale 1:1,000,000. Available at URL: www.ags.gov.ab.ca/GIS/gis and mapping.shtml.

Hauge, T.M. and L.B. Keith. 1980. Dynamics of moose populations in the AOSERP study area in northeastern Alberta. Prepared for the Alberta Oil Sands Environmental Research Program by the University of Wisconsin, Department of Wildlife Ecology, Wisconsin, USA.

Hauge, T.M. and L.B. Keith. 1981. Dynamics of moose populations in northeastern Alberta. Journal of Wildlife Management 45:573-597.

Hayes, G. F. and K. D. Holl. 2003. Cattle grazing impacts on vegetation composition and structure of mesic grasslands in California. Conservation Biology 17: 1694-1702.

Horejsi, B.L. and G.E. Hornbeck. 1985. Ungulate Abundance in Cold Lake Monitoring Program: A Report on the First Year of Study to Monitor Ungulate Abundance, Distribution and Habitat Uses in the Cold Lake Phased Project Development Area. Prepared for Esso Resources Canada. Prepared by IEC Beak Consultants Ltd. and Western Wildlife Environments Consulting Ltd. Calgary, Alberta, Canada.

Houston, C.S., D.G. Smith, and C. Rohner. 1998. Great horned owl (Bubo virginianus). In The Birds of North America, No. 372 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, Pennsylvania. USA.

Imperial Oil Resources Ventures Limited (IORVL). 2006. Kearl Oil Sands Project – Mine Development Volume 3, Section 9: Wildlife baseline. Submitted to Alberta

Energy and Utilities Board and Alberta Environment by Imperial Oil Resources Ventures Limited. Calgary, Alberta, Canada.

International Organization for Standardization (ISO), Standard 1996-1, Acoustics – Description, measurement and assessment of environmental noise – Part 1: Basic quantities and assessment procedures, 2003, Geneva Switzerland.

International Organization for Standardization (ISO), Standard 9613-1, Acoustics – Attenuation of sound during propagation outdoors – Part 1: Calculation of absorption of sound by the atmosphere, 1993, Geneva Switzerland.

International Organization for Standardization (ISO), Standard 9613-2, Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation, 1996, Geneva Switzerland.

James, A.R.C., and A.K. Stuart-Smith. 2000. Distribution of caribou and wolves in relation to linear corridors. Journal of Wildlife Management 64(1): 154-159.

Johnsgard, P. 1988. North American Owls. Washington, D.C., Smithsonian Institution Press. 295 pp.

Johnson, D., L. Kershaw, A. MacKinnon, and J. Pojar, 1995. Plants of the western boreal and aspen parkland. Lone Pine Publishing, Edmonton, Alberta.

Kearny, S.R. and F.F. Gilbert. 1976. Habitat use by white-tailed deer and moose on sympatric range. Journal of Wildlife Management 40:645-657.

Kennedy, P.L. and D.W. Stahlecker. 1993. Responsiveness of nesting northern goshawks to taped broadcasts of three conspecific calls. Journal of Wildlife Management 57:249-257.

Komex International Ltd. 2005. Wildlife impact assessment for the Joslyn SAGD Project – Phase IIIA. Prepared for Deer Creek Energy Ltd. Calgary, Alberta, Canada.

Kunnas, F. Wildlife Technician. (Personal Communication) Fish and Wildlife Division, Alberta Sustainable Resource Development. St. Paul, Alberta, Canada.

LaResche, R.E. and R.A. Rausch. 1974. Accuracy and Precision of Aerial Moose Censusing. Journal of Wildlife Management 38:174-182.

Laricina Energy Ltd. (Laricina) 2008, Application to the Alberta Energy Resources Conservation Board and Alberta Environment for the Germain SAGD Project Leskiw, L.A. 1998. Land capability classification for forest ecosystems in the oil sands region (Revised edition). Prepared for Tailings Sand Reclamation Practices Working Group by Can-Ag Enterprises Ltd., Edmonton, AB. 93 pp.

Linsley, R. K., Kohler, M.A., Paulhus, J.L.H., 1982, Hydrology for Engineers. 3rd edition. McGraw-Hill Inc., New York, New York

MacArthur, R. H. & J. W. MacArthur 1961. On bird species diversity. Ecology 42: pp. 594-598.

Matrix Solutions Inc. 2008. Appendix A Dover Central Pilot Project Application, Hydrogeology Assessment. Prepared for Athabasca Oil Sands Corp. In: Athabasca Oil Sands Corp. Dover Central Pilot Project Application, June 2008.

McCune, B. and L. Geiser. 1997. Macrolichens of the Pacific Northwest. Oregon StateUniversity Press, Corvallis, Oregon. A co-publication with the U.S. Department of Agriculture Forest Service. 386 pp.

Meehan, R.H. and R.J. Ritchie. 1982. Habitat requirements of Boreal and Hawk owls in interior Alaska. Pp. 188–196 in Raptor management and biology in Alaska and Western Canada (W.N. Ladd and P.F. Schempgf, Eds.). U.S. Fish Wildl. Serv., Anchorage, Alaska, USA.

Meijer, Marge. Natural Heritage Information Specialist. (Personal Communication) Alberta Natural Heritage Information Centre, Edmonton, Alberta, Canada.

MEMS (Millennium EMS Solutions Ltd.) 2008. Sunshine Oilsands Ltd. West Ells SAGD Project, Application for Approval to the Alberta Energy Resources Conservation Board and Alberta Environment, November 2008.

MEMS, 2008. Sunshine Oilsands Ltd. West Ells SAGD Project Hydrogeology Assessment. Consultants Report No. 4 in Sunshine Oilsands Ltd. West Ells SAGD Project Application submitted to Alberta Energy Resources Conservation Board and Alberta Environment. December 2008.

Mitchell, H.B. 1970. Rapid aerial sexing of antlerless moose in British Columbia. Journal of Wildlife Management 34:645-646.

Morton. F.I, 1983. Operational estimates of aerial evapotranspiration and their significance to the science and practice of hydrology.

Mosher, J.A. and M.R. Fuller. 1996. Surveying woodland hawks with broadcasts of great horned owl vocalizations. Wildlife Society Bulletin 24:531-536.

Mosher, J.A., M.R. Fuller and M. Kopeny. 1990. Surveying woodland raptors by broadcast of conspecific vocalization. Journal of Field Ornithology 61:453-461.

Moss, E. H. 1983. Flora of Alberta. Second Edition, revised by J. G. Packer. University of Toronto Press, Toronto, Ontario.

Mossop, G.D. and Shetsen, I. (comp.) 1994. Geological Atlas of the Western Canada Sedimentary Basin. Canadian Society of Petroleum Geologists and Alberta Research Council. <u>www.ags.gov.ab.ca/publications/wcsb_atlas/atlas.html</u>. Last accessed on: November 14, 2008.

MSWG (Mapping Systems Working Group). 1981. A soil mapping system for Canada: revised. Agriculture Canada, Research Branch, Ottawa. L.R.R.I. Contribution No. 142: 94 pp.

Muller-Schwarze, D., and L. Sun. 2003. The beaver: natural history of a wetlands engineer. Cornell University Press, Ithaca, New York, USA.

Nagy, J.A., Auriat, D., I. Ellsworth, W. Wright, and T. Slack. 2003. Ecology of boreal woodland caribou in the Lower Mackenzie Valley: work completed in the Inuvik Region 1 April 2002 to 31 March 2003. Inuvik, Northwest Territories, Canada.

National Wetlands Working Group. 1988. Wetlands of Canada. Ecological Land Classification Series, No. 24. Environment Canada and Polyscience Publications Inc. Ottawa, Ontario.

Natural Regions Committee 2006. Natural Regions and Subregions of Alberta. Compiled by D.J. Downing and W.W. Pettapiece. Government of Alberta. Pub. No. T/852.

Natural Regions Committee. 2006. Natural Regions and Subregions of Alberta. Compiled by D J. Downing and W. W. Pettapiece. Government of Alberta. Publication No. T/852.

Natural Resources Canada. 1999. Permafrost. The Atlas of Canada, 6th Edition. Available at: <u>http://atlas.nrcan.gc.ca/site/english/maps/environment/land/permafrost</u>. Last accessed on November 21, 2008.

NatureServe. 2008, 2006. NatureServe Explorer: An Online Encyclopedia of Life [web application]. Version 6.1. NatureServe, Arlington, Virginia. World wide web page (http://www.NatureServe.org/explorer/) accessed October 2008.

NHC (Northwest Hydraulic Consultants) 2008. Hydrology Assessment for Sunshine Oilsnads West Ells SAGD Project. Consultant Report #6 in the forSunshine Oilsnads

West Ells SAGD Project Application for Approval to the Alberta Energy Resources Conservation Board and Alberta Environment, November 2008.

Nietfeld, M., J. Wilk, K. Woolnough, and B. Hoskin. 1985. Wildlife habitat requirement summaries for selected wildlife species in Alberta. Alberta Energy and Natural Resources, Fish and Wildlife Division, Wildlife Resource Inventory Unit. Edmonton, Alberta, Canada.

Oberg, P.R. 2001. Responses of mountain caribou to linear features in a west-central Alberta landscape. M.Sc. thesis. University of Alberta, Edmonton, Alberta, Canada.

Olsen, B., J. Beck, B. Beck, M. Todd, and R. Bonar. 1999. Fisher winter cover: habitat suitability index model version 3. Foothills Model Forest, Hinton, Alberta, Canada.

Ozoray, G., D. Hackbarth and A.T. Lytviak, 1980. Hydrogeology of the Bitmount-Namur Lake area, Alberta. Alberta Research Council. Earth Sciences Report 78-6.

Paton, J.A. 1999. The Liverwort Flora of the British Isles. Harley Books, Martins, England.

Pattie, D., and C. Fisher. 1999. Mammals of Alberta. Lone Pine Publishing. Edmonton, Alberta, Canada.

Pedocan Land Evaluation Ltd. 1993. Soil series information for reclamation planning in Alberta. Alberta Conservation and Reclamation Council Report No. RRTAC 93-7 (2 volumes). ISBN 0-7732-6041-2. Various pagings.

Penner, D.F. 1976. Preliminary baseline investigations of furbearing and ungulate mammals using Lease No. 17. Environmental Research Monograph 1976-3. Prepared by Renewable Resources Consulting Services Ltd. for Syncrude Canada Ltd., Fort McMurray, Alberta, Canada.

Phillips, R. 1991. Mushrooms of North America. Little, Brown, and Company, Boston, Massachusetts.

Pielou, E.C. 1966. The measurement of diversity in different types of biological collections. Journal of Theoretical Biology 13: 131-144.

Powell, T. Area Wildlife Biologist. (Personal Communication) Fish and Wildlife Division, Alberta Sustainable Resource Development. Fort McMurray, Alberta, Canada.

Power Plant Construction Noise Emissions. Allan M. Teplitzky & Eric W. Wood, Internoise '78 Conference Proceedings, pp 279 – 284. Preston, C.R. and R.D. Beane. 1993. Red-tailed hawk (Buteo jamaicensis), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online:

http://bna.birds.cornell.edu/bna/species/052doi:10.2173/bna.52

Province of Alberta. 2005. Conservation and Reclamation Regulation. Alberta Regulation 115/93 of Environmental Protection and Enhancement Act. Queen's Printer for the Alberta Government. 17 pp.

RAMP. 2005. RAMP Technical Design and Rationale. Prepared for the RAMP Steering Committee by Hatfield Consultants Ltd., Stantec Consulting Ltd., Mack, Slack, and Associates Inc., and Western Resource Solutions. November 2005.

RAMP. 2007. Regional Aquatics Monitoring Program: 2007 Technical report. Prepared for RAMP Steering Committee by Hatfield Consultants Ltd., Stantec Consulting Ltd., Mack, Slack, and Associates Inc., and Western Resource Solutions. April 2008.

Resource Inventory Committee (RIC). 2001. Inventory methods for raptors: Standards for components of British Columbia's biodiversity. No. 11. Ministry of Sustainable Resource Management, Environment Inventory Branch. Victoria, British Columbia, Canada.

Resource Inventory Committee. 1996. Inventory methods for owl surveys: Stands for components of British Columbia's biodiversity. No 42. Ministry of Environment. Ecosystems Branch, Victoria, British Columbia, Canada.

Roberts, W. and V. Lewin. 1979. Habitat utilization and population densities of the amphibians of northeastern Alberta. Canadian Field-Naturalist 93(2): 144-154.

Roberts, W., V. Lewin, and L. Brusnyk. 1979. Amphibians and reptiles in the AOSERP study area. Alberta Oil Sands Environmental Research Program. AOSERP Project TF 5.1.

Romito, T., K. Smith, B. Beck, J. Beck, M. Todd, R. Bonar, and R. Quinlan. 1999. Moose winter habitat: habitat suitability index model, version 5. Foothills Model Forest, Hinton, Alberta, Canada.

Roosa, D.M.; Eilers, L.J. 1978. Endangered and threatened Iowa vascular plants. Iowa State Preserves Advisory Board. p.93. Special Report. No. 5.

Rosendahl, C.O. 1947. Studies in Chrysosplenium with special reference to the taxonomic status and distribution of C. iowense. Rhodora 49(578): 25-35.

Rosenfield, R.N., J. Bielefeldt, R.K. Anderson and W.A. Smith. 1985. Taped calls as an aid in locating Cooper's hawk nests. Wildlife Society Bulletin 13:62-63.

Ruddock, M., and D.P. Whitfield. 2007. A review of disturbance distances in selected bird species. A report from Natural Research (Projects) Ltd. to Scottish Natural Heritage.

Salmo Consulting Inc. 2004. Deh Cho cumulative effects study: management indicators and thresholds. Prepared for: Deh Cho Land Use Planning Committee, Fort Providence, Northwest Territories, Canada.

Schaefer, J.A., A.M. Veitch, F.H. Harrington, W.K. Brown, J.B. Theberge, and S.N. Luttich. 2001. Fuzzy structure and spatial dynamics of a declining woodland caribou population. Oecologia 126: 507-514.

Schalkwijk-Barendsen, H.M.E. 1991. Mushrooms of Western Canada. Lone Pine Publishing, Edmonton, Alberta.

Schneider, R.R. 2002. Alternative Futures: Alberta's Boreal Forest at the Crossroads. The Federation of Alberta Naturalists. Edmonton, Alberta.

Schuster, R.M. 1953. Boreal Hepaticae: A manual of the liverworts of Minnesota and adjacent regions. The American Midland Naturalist 49: 257-684.

Scire, J. and C. Escoffier-Czaja (2004). CALPUFF Training Course, Canadian Prairie and Northern Section of the Air and Waste Management Association. 843 pp.

Scire, J.S., D.G. Strimaitis and R.J. Yamartino. 2000. A User's Guide for the CALPUFF Model (Version 5.0). Concord, MA: Earth Technologies Inc.

SCWG (Soil Classification Working Group). 1998. The Canadian system of soil classification. Agriculture and Agri-Food Canada Publication 1646 (Revised, Third Edition). 187 pp.

Semenchuk, G. 1992. The atlas of breeding birds of Alberta. Federation of Alberta Naturalists. Edmonton, Alberta, Canada.

Shell Canada Limited. 2007. Application for approval of the Jackpine Mine expansion project and Pierre River mine project. Environmental Impact Assessment. Volume 5: terrestrial resources and human environment. Submitted to Alberta Energy and Utilities Board and Alberta Environment. Calgary, Alberta, Canada.

Skinner, D.L. 1984. Selection of winter food by beavers at Elk Island National Park. M.Sc. thesis, University of Alberta. Edmonton, Alberta, Canada.

Smith, W.R. 1981. Status report: Chrysosplenium iowense Rydb., Minnesota Heritage Program, 4 pp.

Smith, W.T. and R.D. Cameron. 1983. Factors affecting pipeline crossing success of caribou. In Proceedings of the 1st North American Caribou Workshop, Whitehorse, Yukon. Eds. A.M Martell and D.E. Russell. 29-29 September 1983.

Sorensen, T., P. D. McLoughlin, D. Hervieux, E. Dzus, J. Nolan, B. Wynes, and S. Boutin. 2007. Determining sustainable levels of cumulative effects for boreal caribou. Journal of Wildlife Management 72(4): 900-905.

SPSS. 2007. SPSS 16.0 for Windows. Copyright 1993 – 2007. Polar Engineering and Consulting.

SQCWG (Soil Quality Criteria Working Group). 1987. Soil quality criteria relative to disturbance and reclamation (revised). Alberta Agriculture, Food and Rural Development, Edmonton. 56 pp.

Strong, W.L., and Leggat, K.R. 1992. Ecoregions of Alberta. Alberta Forestry, Lands and Wildlife, Rep. No. T/245.

Stuart-Smith, A.K., Bradshaw, C.J.A., Boutin, S., Hebert, D.M., and A.B. Rippin. 1997. Woodland caribou relative to landscape patterns in northeastern Alberta. Journal Wildlife Management. 61 (3): 622-633.

Sunshine Oilsands Ltd. 2008. West Ells SAGD Project - Application, March 2010

Tajek, J., W.W. Pettapiece, and K.E. Toogood. 1985. Water erosion potential of soils in Alberta: Estimates using a modified USLE. Agriculture Canada, Research Branch, Ottawa. Agriculture Canada Technical Bulletin No. 1985-29: 35 pp.

Takats, D.L. 1998. Barred owl habitat use and distribution in the Foothills Model Forest. M.Sc. thesis, University of Alberta, Edmonton, Alberta, Canada.

Takats, D.L. and G.L. Holroyd. 1997. Owl broadcast surveys in the Foothills Model Forest, Alberta, Canada. In J.R. Duncan, D.H. Johnson and T.H. Nichols (ed.). Second International Symposium on the Biology and Conservation of Owls in the Northern Hemisphere. United States Department of Agriculture, Forest Service General Technical Report. NC-190. 421-430.

Thomas, D.C., Barry, S.J., and Alaie, G. 1996. Fire-caribou relationships in northern Canada. Rangifer 16: 57-67.

Thomasma, L.E., T.D. Drummer, and R.O. Peterson. 1994. Modeling habitat selection by fishers. Pages 316-325 In S.W. Buskirk, A.A. Harestad, M.G. Raphael, and R.A. Powell, editors. Martens, sables and fishers – biology and conservation. Cornell University Press, Ithaca, New York, USA.

Timmerman, H.R., and J.G. McNichol. 1988. Moose habitat needs. Pages 238-245 in Forestry and wildlife management in the boreal forest – an Ontario workshop. Thunder Bay, Ontario, Canada. December 7-9, 1987. Ontario Ministry of Natural Resources. Forestry Chronicle, June 1988.

Tully, S.M. 2006. Habitat selection of fishers (Martes pennanti) in an untrapped refugium: Algonquin Provincial Park. M.Sc. thesis. Trent University, Peterborough, Ontario, Canada.

Turchenek, L.W. and J.D. Lindsay. 1982a. Soils inventory of the Alberta Oil Sands Environmental Research Program Study Area. Alberta Research Council, Soils Department, Edmonton, AB. AOSERP Report 122. 217 pp. plus maps.

Turchenek, L.W. and J.D. Lindsay. 1982b. Soils inventory of the Alberta Oil Sands Environmental Research Program Study Area – Appendix 9-4. Alberta Research Council, Soils Department, Edmonton, AB. AOSERP Report 122. 264 pp.

United States Environmental Protection Agency (US EPA). 1993. User's Guide to the Building Profile Input Program, October 1993. US Environmental Protection agency – Office of Air Quality Planning and Standards.

United States Environmental Protection Agency (US EPA). 2003. Appendix W to Part 51, Guideline on Air Quality Models. 40 CFR Ch1 (April 15, 2003 Edition).

Vitt, D.H., J. Marsh, and R. Bovey. 1988. Mosses, Lichens & Ferns of Northwest North America. A Photographic Guide. Lone Pine Press, Edmonton and University of Washington Press, Seattle.

Weber, R. M. 1979. Species biology of Chrysosplenium iowense. [M.A. Thesis]: University of Northern Iowa. Cedar Falls, IA. 94p.

Weclaw, P., and R.J. Hudson. 2004. Simulation of conservation and management of woodland caribou. Ecological Modelling 177: 75-94.

Westworth Associates Environmental Ltd. 2002. A review and assessment of existing information for key wildlife and fish species in the Regional Sustainable Development Strategy Study Area. Prepared for the Cumulative Environmental Management Association, Wildlife and Fish Working Group. Prepared by Westworth Associates Environmental Ltd. Edmonton, Alberta, Canada.

Westworth, Brusnyk and Associates. 1991. Ecology of moose and white-tailed deer in relation to the phased development of the Cold Lake Heavy Oil Extraction Facility. ESSO Resources Canada Ltd. Edmonton, Alberta, Canada.

Westworth, Brusnyk and Associates. 1996. Waterfowl, raptors and breeding birds of the Suncor Lease in 1995. Prepared for Suncor Inc., Oil Sands Group. Edmonton, Alberta, Canada.

Yost, A.C., and R.G. Wright. 2001. Moose, caribou and grizzly bear distribution in relation to road traffic in Denali National Park, Alaska. Arctic 54(1): 41-48.

Young, K. 2008. Personal communication (e-mail to D. Moats, Hatfield Consultants Partnership, West Vancouver, BC, regarding status of West Ells Project footprint and aquatic resources related discipline effects findings). Millennium EMS Solutions, Edmonton, AB. October 15.

Summary of activities to date: Discussions regarding the proposed West Ells SAGD Project location, size and access requirements. Communication with the ACFN Industry Relations Corporation (IRC) is ongoing and Sunshine is currently reviewing the potential of joining the ACFN IRC as an associate member and will provide updates as consultation continues.					
Date	Name	Forum	Discussion	Issues	Follow up
November 1, 2008	Community of Fort Chipewyan	Open House	Sunshine representatives attend the ACFN industrial open house in Fort Chipewyan. Review of2007-2008 West Ells core hole program and potential West Ells SAGD project area with community members.	N/A	N/A
April 30, 2008	ACFN IRC	Phone	Telephone call to stakeholder to establish meeting with new ACFN IRC director for May 28, 2008.	N/A	N/A
May 28, 2008	ACFN IRC	Meeting	Meeting to discuss who Sunshine Oilsands is and review proposed 2008- 2009 exploration programs. Discuss West Ells Project application timeline and size / scope of project.	N/A	N/A
August 12, 2008	ACFN IRC	Mail	2008-2009 West Ells exploration notification package mailed to ACFN IRC for review.	N/A	N/A
Sept 9, 2008	ACFN IRC	Phone Call	No comment was made regarding specific West Ells activities. Informed that a West Ells SAGD project newsletter will be sent to the IRC for review in later October.	N/A	N/A
October 31, 2008	ACFN IRC	Newsletter	Proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter mailed out for review.	N/A	N/A
November 21, 2008	ACFN IRC	E-mail	E-mail request for Sunshine to review joining the ACFN IRC as an associate member. Sunshine is to review the possibility and schedule a meeting.	N/A	Schedule follow up meeting.
December 18, 2008	ACFN IRC	Newsletter	Updated proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter mailed out for review.	N/A	N/A

Summary of activities Communication with the	s to date: Discussions ne ACFN Industry Rela	regarding the ations Corpora	Proposed West Ells SAGD Project location ation (IRC) is ongoing and Sunshine is curre	n, size and access re ntly reviewing the p	equirements. otential of joining the	
ACFN IRC as an associate member and will provide updates as consultation continues.						
Date	Name	Forum	Discussion	Issues	Follow up	
January 20, 2009	ACFN consultant	E-mail	E-mail request for GIS shape files for 2007-2008 OSE programs from ACFN.	N/A	N/A	
January 27, 2009	ACFN consultant	E-mail	Sunshine e-mailed requested shape files for ACFN review and addition to the ACFN dataset.	N/A	N/A	
January 28, 2009	ACFN IRC	Meeting	Meeting to discuss the status of the Sunshine Oilsands West Ells SAGD project and inform that Sunshine is currently not interested in joining the ACFN IRC as an associate member. However, we will review the possibility of joining in the months ahead. Informed ACFN IRC that Sunshine may host an open house in the community of Fort Chipewyan in the months ahead.	No site specific issues raised at this time.	Continuation of consultation activities.	
February 3, 2009	ACFN IRC	E-mail	Sunshine informed of a change in ACFN IRC contact.	N/A	N/A	
February 3, 2009	ACFN IRC	E-mail	E-mail to inform ACFN IRC that the West Ells SAGD project application has been deferred.	N/A	Sunshine will consult further when deemed appropriate.	
March 6, 2009	ACFN IRC	E-mail	Updated consultation logs and West Ells SAGD project newsletter(s) sent along with Sunshine company profile in advance of meeting at ACFN IRC offices.	N/A	N/A	

Summary of activities	• to date: Discussion e ACEN Industry Rel	s regarding the ations Corpora	e proposed West Ells SAGD Project location tion (IRC) is oppoing and Supshine is curre	n, size and access re-	quirements.	
ACFN IRC as an associate member and will provide updates as consultation continues.						
Date	Name	Forum	Discussion	Issues	Follow up	
March 13, 2009	ACFN IRC	Meeting	Meeting with ACFN IRC, discuss the proposed West Ells Project and costs of joining IRC and TEK sharing agreements. As the West Ells project is on hold at this time, it was agreed to defer joining IRC at this time	ACFN IRC is concerned with SAGD cumulative effects, impact on traditional way of life, edge effects, requested to see Sunshine West Ells lithology diagram.	Sunshine will review IRC requests for information arising from the meeting: , including a Graphic report of lithology on the West Ells lease area, more recent imagery of the project footprint map, raw Lidar data and review the request of having the ACFN Elders participation in identifying Traditional Resources in the vicinity of these new roads.	
May 26, 2009	ACFN IRC	Phone Call	Message to confirm that the West Ells Project application is now on hold until further notice.	N/A	Will consult further when application is prepared for submission.	
October 29, 2009	ACFN IRC	E-mail	Sunshine in receipt of e-mail stating that the ACFN Business Group has entered into a Joint Venture with Allnorth Consultants Limited.	N/A	Sunshine will review this request at a later date, no interested at this time.	

Summary of activities to date: Discussions regarding the proposed West Ells SAGD Project location, size and access requirements. Communication with the ACFN Industry Relations Corporation (IRC) is ongoing and Sunshine is currently reviewing the potential of joining the ACFN IRC as an associate member and will provide updates as consultation continues.						
Date	Name	Forum	Discussion	Issues	Follow up	
March 3, 2010	ACFN community members and ACFN IRC	Helicopter Tour and Meeting	Toured with ACFN community and ACFN IRC members via helicopter to the West Ells Project area for a site visit and had a meeting to discuss issues surrounding the project.	Proximity of proposed plant site to lake and water use for steaming of wells were the two main issues raised by the ACFN during the tour.	Scheduling of meetings with ACFN elders to discuss these issues and provide clarity regarding water use and protection strategies.	
March 30, 2010	ACFN IRC	Newsletter	Sunshine sent a revised newsletter to all stakeholders detailing the updated footprint and providing a description of Phase 1 and 2 of the proposed West Ells SAGD Project.	N/A	N/A	

Sunshine Oilsands Ltd. West Ells SAGD Project Consultation Log Chipewyan Prairie D'ene First Nation (CPDFN)

Summary of activities to date: Discussions regarding the proposed West Ells SAGD Project location, size and access requirements. Communication with the CPDFN Industry Relations Corporation (IRC) is ongoing and Sunshine will provide updates as activities progress.					
Date	Name	Forum	Discussion	Issues	Follow up
November 1, 2008	CPDFN	Phone Call	Set meeting date for February 21, 2008.	N/A	N/A
April 30, 2008	CPDFN	Meeting	Discussion of West Ells SAGD Project and ongoing exploration activities. Jason does not see a reason for Sunshine to join their IRC as their traditional lands are South of Fort McMurray are not affected by the proposed West Ells project area.	N/A	N/A
May 28, 2008	CPDFN	Mail	Mailed out formal 2008-2009 West Ells exploration notification package to CPDFN IRC for review.	N/A	N/A
August 12, 2008	CPDFN	Phone Call	Place phone calls to CDFN IRC to set up meetings to further discuss the West Ells SAGD project application with no response.	N/A	N/A
September 9, 2008	CPDFN	Phone Call	Place phone calls to CPDFN IRC to set up meetings to further discuss the West Ells SAGD project application with no response.	N/A	N/A
October 31, 2008	CPDFN	Newsletter	Mailed out the proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review.	N/A	N/A
December 18, 2008	CPDFN	Newsletter	Mailed out the updated proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review.	N/A	N/A
January 28, 2009	CPDFN	Meeting	Meeting to further discuss the West Ells SAGD project application footprint and timeline for application submission.	N/A	N/A

Sunshine Oilsands Ltd. West Ells SAGD Project Consultation Log Chipewyan Prairie D'ene First Nation (CPDFN)

Summary of activities to date: Discussions regarding the proposed West Ells SAGD Project location, size and access requirements. Communication with the CPDFN Industry Relations Corporation (IRC) is ongoing and Sunshine will provide updates as activities progress.					
Date	Name	Forum	Discussion	Issues	Follow up
May 26, 2009	CPDFN	Phone Call	Message confirming that the West Ells Project application is now on hold until further notice.	N/A	Will consult further when application is prepared for submission.
March 30, 2010	CPDFN	Newsletter	Sunshine mailed out a revised newsletter to all stakeholders detailing the updated footprint and providing a description of Phase's 1 and 2 of the proposed West Ells SAGD Project.	N/A	N/A

Sunshine Oilsands Ltd. West Ells SAGD Project Consultation Log Fort McMurray First Nation (FMFN)

Summary of activities to date: Discussions regarding the proposed West Ells SAGD Project location, size and access requirements. Communication with the Fort McMurray First Nation Industry Relations Corporation (FMFN IRC) is ongoing and Sunshine will provide updates as activities progress.

Date	Name	Forum	Discussion	Issues	Follow up
February 4, 2008	FMFN IRC	Phone	Discussion of proposed 2008-2009 West Ells exploration activities and West Ells Phase 1 project.	N/A	N/A
May 28, 2008	FMFN IRC	Meeting	Meeting to discuss ongoing West Ells exploration activities and West Ells Project application timing and scope.	N/A	N/A
October 31, 2008	IRC Director	Newsletter	Proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter mailed out for review.	N/A	N/A
December 18, 2008	IRC Director	Newsletter	Updated proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review.	N/A	N/A
May 26, 2009	ACFN IRC	Phone Call	Message from Sunshine to confirm that the West Ells Project application is now on hold until further notice.	N/A	Will consult further when application is prepared for submission.
March 30, 2010	IRC Director	Newsletter	Sunshine mailed out a revised newsletter to all stakeholders detailing the updated footprint and providing a description of Phase 1 and 2 of the proposed West Ells SAGD Project.	N/A	N/A

Summary of activities to date: Discussions regarding the proposed West Ells SAGD Project location, size and access requirements. Communication with the Fort McKay Industry Relations Corporation (IRC) is ongoing					
Date	Name	Forum	Discussion	Issues	Follow up
December 18, 2007	Fort McKay IRC	Meeting	Sunshine representatives attend "Day in McKay" with FM IRC.	N/A	Further IRC membership discussions required
February 20, 2008	Fort McKay IRC	Meeting	Meeting with IRC to discuss the purpose of Fort McKay Industry Relations Corporation (IRC) and the proposed West Ells SAGD Project application footprint, access and proximity to Moose Lake.	Access control, Security, Type of Development Water Use will be issues with the community of Fort McKay.	Pre-regulatory application submission open house requested by IRC and will be set up at later date
March 5, 2008	Fort McKay IRC	E-mail and Letter	Sunshine formally joins Fort McKay IRC.	N/A	N/A
June 26, 2008	Community of Fort McKay	Treaty Days	Sunshine representatives attend Fort McKay Treaty Days events in Fort McKay.	N/A	N/A
June 30, 2008	Fort McKay IRC	E-mail	E-mailed from Sunshine regarding trapper meeting, chief and council and open house dates.	N/A	Awaiting reply
July 6, 2008	Fort McKay IRC	E-mail	E-mail to Sunshine in respect to the trapper coordinator, open house set up and that a chief and council meeting will be set up for September or October of this year.	N/A	To follow up with appropriate IRC people to coordinate various activities.
July 8, 2008	Fort McKay IRC	E-mail	E-mail to Sunshine detailing that an open house would be preferred to occur in the community of Fort McKay versus in Fort McMurray, options for dates were made available.	N/A	To confirm a preferred open house date.
August 19, 2008	Holly Fortier Fort McKay IRC	E-mail	E-mail from Sunshine to confirm that the requested Open House was set for October 14 th . Reply confirmation to Sunshine.	N/A	N/A

Summary of activities to date: Discussions regarding the proposed West Ells SAGD Project location, size and access requirements. Communication with the Fort McKay Industry Relations Corporation (IRC) is ongoing					
Date	Name	Forum	Discussion	Issues	Follow up
September 2, 2008	Fort McKay IRC	E-mail	E-mail from Sunshine to confirm that the Chief and Council meeting date has been set.	No date set for Chief and Council meeting as of yet	IRC to provide information
September 2, 2008	Fort McKay IRC	E-mail	E-mail from Sunshine with a copy of the proposed West Ells SAGD Project footprint and proposed high grade access route for review and comment.	N/A	N/A
September 3, 2008	Fort McKay IRC	E-mail	E-mail to Sunshine saying no date has been confirmed for the Chief and Council meeting as of yet.	N/A	N/A
September 9, 2008	Fort McKay IRC	E-mail	E-mail to Sunshine confirming that Sunshine could meet with Chief and Council on October 7 th or 21 st and that Sunshine was to advise which date works best.	N/A	Preferred date to be provided.
September 10, 2009	Fort McKay IRC	E-mail	E-mail from Sunshine confirming that October 21 st would work best for a Chief and Council meeting.	N/A	N/A
September 11, 2008	Fort McKay IRC	E-mail	E-mail to Sunshine saying that Sunshine has been tentatively added to the October 21 st Chief and Council meeting agenda.	N/A	N/A
September 11, 2008	Fort McKay IRC	E-mail	E-mail from Sunshine requesting to have the AM slot for the October 21 st Chief and Council meeting.	N/A	N/A
September 16, 2008	Fort McKay IRC	Phone Call	Trapper meetings are set up for September 29, 2008. The proposed West Ells SAGD Project is to be discussed with Fort McKay Trappers.	N/A	N/A

Summary of activities to date: Discussions regarding the proposed West Ells SAGD Project location, size and access requirements. Communication with the Fort McKay Industry Relations Corporation (IRC) is ongoing						
Date	Name	Forum	Discussion	Issues	Follow up	
September 29, 2009	Fort McKay Trappers	Meetings	Meetings with affected West Ells area trapline holders to discuss the proposed 08/09 exploration program and the proposed West Ells SAGD Project in detail. One trapper was unable to attend the trapper meeting due to health reasons.	Helicopter tour requested	Helicopter tour arranged for October 6, 2008	
October 3, 2009	Fort McKay IRC	E-mail	E-mail to confirm that a helicopter has been booked for the West Ells SAGD project area tour and that the trappers are still interested in the joint tour.	N/A	N/A	
October 6, 2009	Fort McKay Trapper	Meeting and Helicopter Tour	Meeting and complete a detailed aerial review of the proposed West Ells Project area footprint and access road. Two trappers were unable to attend the helicopter tour	Compensation regarding proposed West Ells Project.	Further discussions to be held with.	
October 7, 2008	Fort McKay IRC	E-mail	Sunshine e-mailed a copy of the Fort McKay Open House powerpoint presentation for review and commentary from the IRC.	N/A	N/A	
October 8, 2009	Fort McKay IRC	Phone	Sunshine discussed the open house powerpoint presentation and recommended changes to make the powerpoint more suitable for the Elders which will be in attendance.	N/A	Powerpoint changes in advance of open house.	
October 9, 2008	Fort McKay IRC	E-mail	Sunshine e-mailed community notice information and detailed footprint map to McKay IRC to post in advance of the upcoming open house.	N/A	N/A	

Summary of activities to date: Discussions regarding the proposed West Ells SAGD Project location, size and access requirements. Communication with the Fort McKay Industry Relations Corporation (IRC) is ongoing						
Date	Name	Forum	Discussion	Issues	Follow up	
October 14, 2008	Community of Fort McKay (59 Elders and IRC members)	Open House	Attendance at West Ells SAGD Project and high grade access road Open house in the community of Fort McKay which was attended by 59 local community members.	Proximity to Namur and Moose Lake Indian Reserves (IR's 174 A and 174 B), Road control (security issues), Use of ground water to generate steam caused concern, Elders Advisory Group not set up yet by IRC, SAGD vs. Mining needs to be clarified further,	Clarity to be provided on overview mapping, consultation with McKay and ASRD regarding potential access control, details required to show difference between ground and surface water, IRC to set up Elders Advisory Group, differences between SAGD and Mining will be described in more detail during next open house.	
October 20, 2009	Fort McKay IRC	E-mail	E-mail from Sunshine to confirm that Sunshine was still invited to the Chief and Council meeting on November 4, 2008 which was moved from October 21 st .	N/A	Awaiting feedback.	
October 24, 2008	Fort McKay IRC	E-mail	E-mail to Sunshine stating that Sunshine was now invited to attend the Fort McKay Chief and Council Meeting on November 18, 2009.	N/A	N/A	
October 31, 2008	Fort McKay IRC	Newsletter	Proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter mailed out for review.	N/A	N/A	
November 08, 2008	Fort McKay IRC	E-mail	E-mail to Sunshine confirming that Sunshine will not be able to meet with Chief and Council until January of 2009.	N/A	N/A	

Summary of activities to date: Discussions regarding the proposed West Ells SAGD Project location, size and access requirements. Communication with the Fort McKay Industry Relations Corporation (IRC) is ongoing						
Date	Name	Forum	Discussion	Issues	Follow up	
November 11, 2008	Fort McKay IRC	E-mail	E-mail from Sunshine to fast track the Chief and Council meeting as the date has been moved often.	N/A	N/A	
November 13, 2008	Fort McKay IRC	E-mail	E-mail confirming Fort McKay Chief and Council meeting for January of 2009 and finalization of Elders Advisory Group.	Finding it difficult to get a set date for Chief and Council	IRC to finalize a date ASAP.	
November 17, 2009	Fort McKay IRC	E-mail	E-mail to Sunshine detailing the proposed 2009/2010 IRC budget.	N/A	Provide commentary regarding proposed budget numbers for 09/10	
December 2, 2008	Fort McKay IRC Budget Meeting and Elders Christmas Party	Meeting	Fort McKay IRC annual budget meeting and Elders Christmas Party in Fort McKay.	N/A	N/A	
December 18, 2008	Fort McKay IRC	Newsletter	Updated proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter mailed out for review.	N/A	N/A	
January 29, 2009	Fort McKay IRC	Phone	Discussion of the West Ells SAGD Project status, cancellation of the Chief and Council meeting and potential next steps.	N/A	N/A	
May 4, 2009	Fort McKay IRC	Meeting	Discussion of West Ells Project application status and that the application will not be submitted in the near future and that Sunshine remains committed to working with the community of Fort McKay once the decision has been made to finalize the application and submit to the regulators for approval.	N/A	N/A	

Summary of activities to date: Discussions regarding the proposed West Ells SAGD Project location, size and access requirements. Communication with the Fort McKay Industry Relations Corporation (IRC) is ongoing						
Date	Name	Forum	Discussion	Issues	Follow up	
March 4, 2010	Fort McKay IRC	Meeting	Meeting to discuss the West Ells Project application status. Sunshine presented the updated proposed footprint of the project for review. Further discussion took place regarding the possibility of Sunshine rejoining the Fort McKay IRC.	No specific issues raised at this time	An updated West Ells project newsletter will be sent to Fort McKay during the week of March 29 th to April 2 nd .	
March 30, 2010	Fort McKay IRC	Newsletter	Sunshine sent a revised newsletter to all stakeholders detailing the updated footprint and providing a description of Phase's 1 and 2 of the proposed West Ells SAGD Project.	N/A	N/A	

Sunshine Oilsands Ltd. West Ells SAGD Project Consultation Log **Mikisew Cree Nation (MCFN)**

Summary of activities to date: Discussions regarding the proposed West Ells SAGD Project location, size and access requirements. Communication with the Mikisew Government and Industry Relations (MCFN GIR) is ongoing and Sunshine will provide updates as activities progress.

Date	Name	Forum	Discussion	Issues	Follow up
February 20, 2008	MCFN GIR	Meeting	Meeting to discuss the West Ells SAGD project application and ongoing West Ells exploration activities. Sunshine agreed to ongoing digital data sharing and potential open house once the Project application has been submitted.	N/A	GIS shapefile sharing and continuation of dialogue with GIR.
October 31, 2008	MCFN GIR	Newsletter	Proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter mailed out for review.	N/A	N/A
December 18, 2008	MCFN GIR	Newsletter	Proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter mailed out for review.	N/A	N/A
January 12, 2009	MCFN GIR	E-mail	Sunshine received a response in regards to the latest informational newsletter, GIR asked for clarification in regard to the project location in relation to Fort McMurray.	Detail required on project location in relation to the City of Fort McMurray.	E-mail GIR with requested details regarding the West Ells Project location.
January 12, 2009	MCFN GIR	E-mail	E-mail from Sunshine regarding the proposed Project and its location relative to Fort McMurray.	N/A	Further follow up with MCFN GIR required to ensure location of Project is clear.
January 13, 2009	MCFN GIR	E-mail	E-mail received regarding the West Ells SAGD Project newsletter, review request for a meeting to discuss the project and set up a meeting time and date. Meeting set for February 3, 2009 at MCFN GIR offices in Fort McMurray.	N/A	Attend upcoming meeting with GIR.
Sunshine Oilsands Ltd. West Ells SAGD Project Consultation Log **Mikisew Cree Nation (MCFN)**

Summary of activities to date: Discussions regarding the proposed West Ells SAGD Project location, size and access requirements. Communication with the Mikisew Government and Industry Relations (MCFN GIR) is ongoing and Sunshine will provide updates as activities progress.

Date	Name	Forum	Discussion	Issues	Follow up
January 13, 2009	MCFN Lawyer	E-mail	E-mail to Sunshine with a proposed GIR budget and bi-lateral agreement for Sunshine review.	Cost is prohibitive at this time.	Feedback to be provided.
January 16, 2009	MCFN GIR	E-mail	E-mail from Sunshine confirming receipt of MCFN request for Sunshine to consider joining the MCFN GIR.	MCFN request for Sunshine to join the GIR.	GIR Meeting on February 3, 2009 at MCFN offices
January 23, 2009	MCFN	Fax	Letter to Sunshine requesting oil sands industry to join the MCFN GIR.	MCFN request for Sunshine to join the GIR.	Response required
January 26, 2009	MCFN GIR	E-mail	E-mail from Sunshine requesting date change for GIR meeting to January 27, 2009. MCFN GIR agreed to change meeting to the requested date.	N/A	Meeting moved to January 27 th .
January 27, 2009	MCFN GIR	Meeting	Meeting to discuss West Ells SAGD project, review project details and anticipated regulatory application submission timeline. GIR provided overview of services which could be provided if Sunshine were to join. GIR outlined costs associated with EPEA application review.	GIR concerned that industry is not committed to paying GIR fees this year. Sunshine is not willing to fund the GIR at this time.	Further meetings to take place closer to West Ells application date.
March 3, 2009	MCFN	Letter	Letter sent detailing Sunshine's position on joining the MCFN GIR.	Sunshine currently not interested in joining the MCFN GIR at this time.	Sunshine to review the possibility of joining the MCFN GIR closer to West Ells application submission date.
March 9, 2009	MCFN Lawyer	E-mail	E-mail to Sunshine requesting Sunshine to finalize the GIR agreement ASAP.	N/A	E-mail response is required

Sunshine Oilsands Ltd. West Ells SAGD Project Consultation Log **Mikisew Cree Nation (MCFN)**

Summary of activities to date: Discussions regarding the proposed West Ells SAGD Project location, size and access requirements. Communication with the Mikisew Government and Industry Relations (MCFN GIR) is ongoing and Sunshine will provide updates as activities progress.

Date	Name	Forum	Discussion	Issues	Follow up
March 9, 2009	MCFN Lawyer	E-mail	E-mail from Sunshine detailing Sunshine's current position on joining the MCFN GIR	Sunshine not prepared to join the GIR at this time	Sunshine to review the possibility of joining the MCFN GIR closer to West Ells application submission date.
May 26, 2009	MCFN GIR	Phone Call	Telephone call from Sunshine representative confirming that the West Ells Project application is now on hold until further notice.	N/A	Will consult further when application is prepared for submission.
March 30, 2010	MCFN GIR	Newsletter	Sunshine sent a revised newsletter to all stakeholders detailing the updated footprint and providing a description of Phase 1 and 2 of the proposed West Ells SAGD Project.	N/A	N/A

Sunshine Oilsands Ltd. West Ells SAGD Project Consultation Log **Metis Local 1935**

Summary of activities to date: Communication with Metis Local 1935 is ongoing and Sunshine will provide updates as activities progress.								
Date	Name	Forum	Discussion	Issues	Follow up			
October 31, 2008	Metis Local 1935	Newsletter	Mailed out the proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review.	N/A	N/A			
December 18, 2008	Metis Local 1935	Newsletter	Mailed out the updated Sunshine West Ells SAGD Project application informational newsletter.	N/A	N/A			
May 26, 2009	Metis Local 1935	Newsletter	Mailed out an updated proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review.	N/A	Will consult further when application is prepared for submission.			
March 30, 2010	Metis Local 1935	Newsletter	Sunshine mailed out revised newsletter to all stakeholders detailing the updated footprint and providing a description of Phase 1 and 2 of the proposed West Ells SAGD Project.	N/A	N/A			

Sunshine Oilsands Ltd. West Ells SAGD Project Consultation Log **Trapper - TPA # 21**

Summary of activities to date: Communication is ongoing and Sunshine will provide updates as activities progress. To date, no specific concerns raised in relation to the proposed West Ells SAGD Project.							
Date	Name	Forum	Discussion	Issues	Follow up		
October 6, 2008	TPA 21	Proposed Meeting and Helicopter Tour	Trapper unable to attend a map session and helicopter tour to review the proposed West Ells SAGD Project area.	N/A	Ongoing communication.		
October 31, 2008	TPA 21	Newsletter	Mailed out the proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review.	N/A	N/A		
December 18, 2008	TPA 21	Newsletter	Mailed out an updated proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review	N/A	N/A		
May 26, 2009	TPA 21	Phone Call	Telephone call to confirm that the West Ells Project application is now on hold until further notice.	N/A	Will consult further when application is prepared for submission.		
March 30, 2010	TPA 21	Newsletter	Sunshine mailed out a revised newsletter to all stakeholders detailing the updated footprint and providing a description of Phase 1 and 2 of the proposed West Ells SAGD Project.	N/A	N/A		

Sunshine Oilsands Ltd. West Ells SAGD Project Consultation Log **Trapper – TPA # 771**

Summary of activities to date: Communication is ongoing and Sunshine will provide updates as activities progress. To date, no specific concerns raised in relation to the proposed West Ells SAGD Project.						
Date	Name	Forum	Discussion	Issues	Follow up	
February 21, 2008	TPA 771	Meeting and Helicopter Tour	Tour the proposed West Ells SAGD Project area via helicopter.	No site specific issues were raised during helicopter tour.	Ongoing communication.	
September 29, 2008	TPA 771	Meeting	Meeting to further discuss the proposed West Ells SAGD Project. Compensation requested for 5-10 years in advance of West Ells SAGD Project regulatory submission.	Lump sum payment compensation request.	Further discussions to be held.	
October 6, 2008	TPA 771	Meeting and Helicopter Tour	Detailed aerial review of the proposed West Ells Project area footprint and access road via helicopter. Further preliminary discussions were had regarding compensation.	Compensation regarding proposed West Ells Project.	Further discussions to be held.	
October 14, 2008	TPA 771	Meeting	Attendance at the Sunshine Oilsands pre regulatory application open house in Fort McKay. Further discussion regarding compensation.	Compensation regarding proposed West Ells Project.	Awaiting e-mail response detailing his compensation request.	
October 31, 2008	TPA 771	Newsletter	Mailed out the proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review.	N/A	No feedback received	
December 18, 2008	TPA 771	Newsletter	Mailed out an updated proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review.	N/A	No feedback received	
May 26, 2009	TPA 771	Phone Call	Telephone call to confirm that the West Ells Project application is now on hold until further notice.	N/A	Will consult further at later date	
March 30, 2010	TPA 771	Newsletter	Sunshine sent a revised newsletter to all stakeholders detailing the updated footprint and providing a description of Phase 1 and 2 of the proposed West Ells SAGD Project.		N/A	

Sunshine Oilsands Ltd. West Ells SAGD Project Consultation Log **Trapper – TPA # 879**

Summary of activities to date: Communication with is ongoing and Sunshine will provide updates as activities progress. To date, no specific concerns raised in relation to the proposed West Ells SAGD Project.							
Date	Name	Forum	Discussion	Issues	Follow up		
February 21, 2008	TPA 879	Meeting and Helicopter Tour	Meeting and completion of a joint helicopter tour with Edward of the proposed West Ells SAGD Project area.	Nothing raised at time of tour.	Ongoing communication		
October 14, 2008	TPA 879	Meeting	Sunshine Oilsands pre regulatory application open house in Fort McKay.	No site specific issues were raised at time of open house.	Ongoing communication		
October 31, 2008	TPA 879	Newsletter	Mailed out the proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review.	N/A	N/A		
December 18, 2008	TPA 879	Newsletter	Mailed out the updated proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review.	N/A	N/A		
May 26, 2009	TPA 879	Phone Call	Telephone call to confirm that the West Ells Project application is now on hold until further notice.	N/A	Will consult further when application is prepared for submission.		
March 30, 2010	TPA 879	Newsletter	Sunshine sent a revised newsletter to all stakeholders detailing the updated footprint and providing a description of Phase 1 and 2 of the proposed West Ells SAGD Project.	N/A	N/A		

Sunshine Oilsands Ltd. West Ells SAGD Project Consultation Log Alberta Culture and Community Spirit

Summary of activities to date: Sunshine has completed a detailed archeological assessment of the proposed West Ells SAGD Project site and submitted our Application to Culture and Community Spirit for review. Communication with Alberta Culture and Community Spirit is ongoing and Sunshine will provide further updates as dialogue continues.								
Date	Name	Forum	Discussion	Issues	Follow up			
October 31, 2008	ACCS	Newsletter	Mailed out the proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review.	N/A	N/A			
December 18, 2008	ACCS	Newsletter	Mailed out an updated proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review.	N/A	N/A			
April 20, 2009	ACCS	Application to Alberta Culture and Community Spirit	FMA Heritage, on behalf of Sunshine Oilsands, submitted an application for historical clearance in relation to the Proposed West Ells SAGD project area.	N/A	N/A			
March 30, 2010	ACCS	Newsletter	Sunshine sent a revised newsletter to all stakeholders detailing the updated footprint and providing a description of Phase 1 and 2 of the proposed West Ells SAGD Project.	N/A	N/A			

Sunshine Oilsands Ltd. West Ells SAGD Project Consultation Log Alberta Environment (AENV)

Summary of activities to date: Communication regarding the proposed West Ells SAGD Project location, size and consultation requirements. Communication with Alberta Environment is ongoing and Sunshine will provide further updates as dialogue continues.						
Date	Name	Forum	Discussion	Issues	Follow up	
October 31, 2008	AENV	Newsletter	Mailed out the proposed West Ells SAGD Project and high grade road informational newsletter for review.	N/A	N/A	
December 18, 2008	AENV	Newsletter	Mailed out the updated proposed West Ells SAGD Project and high grade road informational newsletter for review.	N/A	N/A	
January 20, 2009	AENV	E-mail	E-mail to confirm the first nation consultation requirements for the West Ells SAGD project.	ASRD provided list that included 5 bands.	Need to confirm with AENV as to whom Sunshine is to consult with.	
January 30, 2009	AENV	E-mail	E-mail to set up meeting to further discuss consultation requirements for West Ells project.	N/A	N/A	
February 10, 2009	AENV	Meeting	Meeting to discuss West Ells Project consultation plan and requirements.	Discuss proposed consultation plan.	Confirmation on consultation requirements to be sent.	
February 13, 2009	AENV	Meeting	E-mail confirming that Fort McKay, Athabasca Chipewyan and Mikisew Cree First Nations are to be consulted with regarding the West Ells Project.	N/A	N/A	
May 26, 2009	AENV	Phone Call	Message that the West Ells Project application is now on hold until further notice.	N/A	Will consult further when application is prepared for submission.	
November 12, 2009	AENV	E-mail	E-mail to find out who the Alberta Environment Aboriginal Consultation replacement is.	N/A	N/A	
November 13, 2009	AENV	E-mail	E-mail to confirm new contact.	N/A	Re-introductory meeting to occur.	
November 13, 2009	AENV	E-mail	E-mail to set up an introductory meeting to discuss the status of the Project application.	N/A	Will follow up further to set up meeting	

Sunshine Oilsands Ltd. West Ells SAGD Project Consultation Log Alberta Environment (AENV)

Summary of activities to date: Communication regarding the proposed West Ells SAGD Project location, size and consultation requirements. Communication with Alberta Environment is ongoing and Sunshine will provide further updates as dialogue continues.								
Date Name Forum Discussion Issues Follow up								
March 30, 2010	AENV	Newsletter	Sunshine sent a revised newsletter to all stakeholders detailing the updated footprint and providing a description of Phase 1 and 2 of the proposed West Ells SAGD Project.	N/A	N/A			

Sunshine Oilsands Ltd. West Ells SAGD Project Consultation Log Alberta Transportation and Infrastructure (ABTRANS)

Summary of activities to date: Sunshine is currently involved in an industry Traffic Impact Assessment working group which is working with Alberta Transportation and the RM of Wood Buffalo to ensure safe access to Highway 63. The industry working group includes Noralta Lodge Ltd, Athabasca Oil Sands Corp. Fortier & Associates, Grizzly Oilsands ULC, Southern Pacific Resource Corp. and Suncor Energy Inc. Communication with Alberta Transportation is ongoing and Sunshine will provide further updates as dialogue continues.									
Date	Name	Forum	Discussion	Issues	Follow up				
October 31, 2008	ABTRANS	Newsletter	Mailed out the proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review.	N/A	N/A				
December 18, 2008	ABTRANS	Newsletter	Mailed out the updated proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review.	N/A	N/A				
March 5, 2009 to present	Industry Traffic Impact Assessment (TIA) Working Group	Ongoing Meetings	Sunshine has attended ongoing meetings and contributed to a group TIA submission which was submitted to Alberta Transportation for approval on September 14, 2009.	TIA rejected by ABTRANS on November 8, 2009.	Meeting with Alberta Transportation to discuss alternative options.				
March 30, 2010	ABTRANS	Newsletter	Sunshine sent a revised newsletter to all stakeholders detailing the updated footprint and providing a description of	N/A	N/A				

Phase 1 and 2 of the proposed West

Ells SAGD Project.

Sunshine Oilsands Ltd. West Ells SAGD Project Consultation Log Agadir Resources Ltd.

Summary of activities to date: Communication regarding the proposed West Ells SAGD Project location, size and access requirements. Communication with Agadir Resources Ltd. is ongoing and Sunshine will provide further updates as dialogue continues.								
Date	Name	Forum	Discussion	Issues	Follow up			
October 31, 2008	Land Manager	Newsletter	Mailed out the proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review.	N/A	N/A			
December 18, 2008	Land Manager	Newsletter	Mailed out the updated proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review.	N/A	N/A			
March 30, 2010	Land Manager	Newsletter	Sunshine sent a revised newsletter to all stakeholders detailing the updated footprint and providing a description of Phase 1 and 2 of the proposed West Ells SAGD Project.	N/A	N/A			

Sunshine Oilsands Ltd. West Ells SAGD Project Consultation Log Alberta Pacific Forest Industries (ALPAC)

Summary of activities to date: Ongoing communication with ALPAC regarding all proposed activities in the West Ells area. Have received numerous disposition approvals from ALPAC over the last two years in the West Ells area. As the FMA holder ALPAC, communication and consultation are ongoing and Sunshine will provide further updates as dialogue continues.								
Date	Name	Forum	Discussion	Issues	Follow up			
May 16, 2008	ALPAC	Phone Call	Discussion regarding West Ells area access requirements. Discuss potential for ILM partnership with ALPAC and other area oil sands operators.	N/A	ALPAC has declined			
June 06, 2008	ALPAC	E-Mail	E-mail to ALPAC regarding access road sharing in the West Ells Area.	No response	No response			
October 31, 2008	ALPAC	Newsletter	Mailed out the proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review.	N/A	N/A			
November 19, 2008	ALPAC	E-Mail	E-mail and detailed project mapping to ALPAC requesting a letter of support for the West Ells SAGD Project and associated access road with a response requested by November 26, 2008	No response	Place follow up phone call			
November 28, 2008	ALPAC	Phone Call	Call to ALPAC regarding letter of support with no response.	No response	No response			
December 18, 2008	ALPAC	Newsletter	Mailed out the updated proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review.	N/A	N/A			
March 30, 2010	ALPAC	Newsletter	Sunshine sent a revised newsletter to all stakeholders detailing the updated footprint and providing a description of Phase 1 and 2 of the proposed West Ells SAGD Project.	N/A	N/A			

Sunshine Oilsands Ltd. West Ells SAGD Project Consultation Log Athabasca Oil Sands Corporation (AOSC)

Summary of activities to date: AOSC and Sunshine Oilsands are currently engaged in ongoing meetings regarding joint ownership of the proposed East / West high grade access road from the existing Petro-Canada Dover High Grade access to section 6-94-17W4M. Meetings began on February 1, 2008 and continue to present date. Communication with AOSC is ongoing and Sunshine will provide further updates as dialogue continues.

Date	Name	Forum	Discussion	Issues	Follow up
February 1, 2008 to Present Date	AOSC	Bi Weekly Meetings	Ongoing discussions regarding West Ells High Grade Access Routing and potential joint venture ownership.	N/A	N/A
October 7, 2008	AOSC	E-mail	E-mail requesting permission to share joint venture access route with community of Fort McKay during open house.	N/A	N/A
October 7, 2008	AOSC	E-mail	E-mail from AOSC regarding confirmation with respect to communication of potential synergies with respect to access during Fort McKay open house.	N/A	N/A
October 31, 2008	AOSC	Newsletter	Mailed out the proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review.	N/A	N/A
November 19, 2008	AOSC	E-Mail	E-mail and detailed project mapping to AOSC requesting a letter of support for the West Ells SAGD Project and associated access road with a response requested by Nov 26, 2008	No response	Place follow up phone calls
November 28, 2008	AOSC	Phone Call	Call to AOSC regarding letter of support with no response.	No response	Ongoing Discussions
December 18, 2008	AOSC	Newsletter	Mailed out an updated proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review.	N/A	N/A
March 30, 2010	AOSC	Newsletter	Sunshine sent a revised newsletter to all stakeholders detailing the updated footprint and providing a description of Phase 1 and 2 of the proposed West Ells SAGD Project.	N/A	N/A

Sunshine Oilsands Ltd. West Ells SAGD Project Consultation Log Alberta Sustainable Resource Development (ASRD)

Summary of activities to date: Sunshine has been engaged in discussions with ASRD from the concept stage of the proposed West Ells Project and consultation regarding site specific footprint details and access corridors will continue on an ongoing basis. Communication with ASRD is ongoing and Sunshine will provide further updates as dialogue continues.							
Date	Name	Forum	Discussion	Issues	Follow up		
February 4, 2008	Senior Forester	Phone Call E-mail	Discussion regarding high grade access into West Ells Project Area, send e-mail requesting meeting with ASRD on February 26, 2008.	N/A	N/A		
February 26, 2008	ASRD Lands Division	Meeting	Sunshine representatives attend meeting with ASRD to discuss high grade access into the West Ells Project area, introduce the Project to ASRD and discuss projected timelines / access requirements.	Moose Lake Access Management Plan (MLAMP)			
February 27, 2008	MLAMP Consultant	E-Mail	E-mail regarding the draft access management plan for review.	The draft MLAMP is general and vague does not address West Ells access issues specifically	Further discussion required		
March 6, 2008	MLAMP Consultant	Meeting	Meeting with ASRD Moose Lake Access Management Consultant to discuss High Grade Access issues.	Access management plan not finalized as of yet	Communication with ASRD regarding access into West Ells area.		
May 28, 2008	Forest Officer	Meeting	Meeting to discuss 2008-2009 Sunshine Oilsands West Ells Caribou Protection Plan and West Ells SAGD project application progress.	N/A	N/A		
June 19, 2008	Forest Officer	E-mail and Hard Copy Letter	Information from ASRD regarding the proposed high grade access corridors for Moose Lake Access Management Plan (MLAMP).	Proposed access does not align with what is being planned by Sunshine and other industry players in area.	Send e-mail to ASRD regarding proposed changes to MLAMP.		
July 11, 2008	Land Use Planner	E-mail	E-mail regarding the proposed MLAMP high grade access routing plan.	Additional Ells River crossings are not desirable, prefer to avoid and access West Ells project via AOSC Dover Pilot.	Further discussion with ASRD and stakeholders required.		

Sunshine Oilsands Ltd. West Ells SAGD Project Consultation Log Alberta Sustainable Resource Development (ASRD)

Summary of activities to date: Sunshine has been engaged in discussions with ASRD from the concept stage of the proposed West Ells Project and								
consultation regarding site specific footprint details and access corridors will continue on an ongoing basis. Communication with ASRD is ongoing and Sunshine will provide further updates as dialogue continues.								
Date	Name	Forum	Discussion	Issues	Follow up			
August 8, 2008	Senior Forester	E-mail	E-mail from ASRD regarding the revised MLAMP.	Routing is still not preferred as it focuses on requirements of Chevron and not Sunshine.	Further discussion with ASRD required.			
October 31, 2008	Forest Officer	Newsletter	Mailed out the proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review.	N/A	N/A			
October 31, 2008	Forest Officer	Phone Call	Call to set up in person meeting to discuss Project access and site.	N/A	N/A			
December 18, 2008	Forest Officer	Newsletter	Mailed out updated proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review.	N/A	N/A			
January 27, 2009	Forest Officer	Meeting	Meeting to discuss the proposed Project footprint.	No issues raised to date.	N/A			
May 26, 2009	Forest Officer	Phone Call	Message that the West Ells Project application is now on hold until further notice.	N/A	Will consult further when application is prepared for submission.			
October 29, 2009	Forest Officer	E-mail	E-mailed regarding the status of the Moose Lake Access Management Plan (MLAMP).	ASRD has not provided an update in a few months.	N/A			
October 30, 2009	Senior Forester	E-mail	E-mail stating that the MLAMP was still in draft form and has not been finalized as of yet.	N/A	Sunshine will continue MLAMP dialogue with ASRD.			
March 30, 2010	Forest Officer	Newsletter	Sunshine sent a revised newsletter to all stakeholders detailing the updated footprint and providing a description of Phase 1 and 2 of the proposed West Ells SAGD Project.	N/A	N/A			

Sunshine Oilsands Ltd. West Ells SAGD Project Consultation Log ATCO Power

Summary of activities to date: Discussions regarding the proposed West Ells SAGD Project location, size and power requirements. Communication with AtTCO Power is ongoing and Sunshine will provide further updates as dialogue continues.							
Date	Name	Forum	Discussion	Issues	Follow up		
October 16, 2008	Operations Manager	Meeting	Meeting with ATCO to discuss power requirements for West Ells Phase 1 central plant facility and associated infrastructure.	N/A	Further discussion required regarding 240 kv lines into Ells area.		
October 31, 2008	Operations Manager	Newsletter	Mailed out the proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review.	N/A	N/A		
December 18, 2008	Operations Manager	Newsletter	Mailed out the updated proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review.	N/A	N/A		
March 30, 2010	Operations Manager	Newsletter	Sunshine sent a revised newsletter to all stakeholders detailing the updated footprint and providing a description of Phase 1 and 2 of the proposed West Ells SAGD Project.	N/A	N/A		

Sunshine Oilsands Ltd. West Ells SAGD Project Consultation Log Athabasca Minerals Inc.

Summary of activities to date: Communication regarding the proposed West Ells SAGD Project location, size and access requirements. Communication with Athabasca Minerals Inc. is ongoing and Sunshine will provide further updates as dialogue continues.							
Date	Name	Forum	Discussion	Issues	Follow up		
October 31, 2008	Gravel Exploration Manager	Newsletter	Mailed out the proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review.	N/A	N/A		
December 18, 2008	Gravel Exploration Manager	Newsletter	Mailed out the updated proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review.	N/A	N/A		
March 30, 2010	Gravel Exploration Manager	Newsletter	Sunshine sent a revised newsletter to all stakeholders detailing the updated footprint and providing a description of Phase's 1 and 2 of the proposed West Ells SAGD Project.	N/A	N/A		

Sunshine Oilsands Ltd. West Ells SAGD Project Consultation Log Bancroft Oil and Gas Ltd.

Summary of activities to date: Communication regarding the proposed West Ells SAGD Project location, size and access requirements. Communication with Bancroft Oil and Gas Ltd. is ongoing and Sunshine will provide further updates as dialogue continues.								
Date	Name	Forum	Discussion	Issues	Follow up			
October 31, 2008	Land Manager	Newsletter	Mailed out the proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review.	N/A	N/A			
December 18, 2008	Land Manager	Newsletter	Mailed out the updated proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review.	N/A	N/A			
March 30, 2010	Land Manager	Newsletter	Sunshine sent a revised newsletter to all stakeholders detailing the updated footprint and providing a description of Phase 1 and 2 of the proposed West Ells SAGD Project.	N/A	N/A			

Sunshine Oilsands Ltd. West Ells SAGD Project Consultation Log Canadian Coastal Resources Ltd.

Summary of activities to date: Communication regarding the proposed West Ells SAGD Project location, size and access requirements. Communication with Canadian Coastal Resources Ltd. is ongoing and Sunshine will provide further updates as dialogue continues.							
Date	Name	Forum	Discussion	Issues	Follow up		
October 31, 2008	Land Manager	Newsletter	Mailed out the proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review.	N/A	N/A		
December 18, 2008	Land Manager	Newsletter	Mailed out the updated proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review.	N/A	N/A		
March 30, 2010	Land Manager	Newsletter	Sunshine sent a revised newsletter to all stakeholders detailing the updated footprint and providing a description of Phase 1 and 2 of the proposed West Ells SAGD Project.	N/A	N/A		

Sunshine Oilsands Ltd. West Ells SAGD Project Consultation Log **Chevron Canada Ltd.**

Summary of activities to date: Discussions regarding the proposed West Ells SAGD Project location, size and access requirements. Communication with Chevron Canada Ltd. is ongoing and Sunshine will provide further updates as dialogue continues.								
Date	Name	Forum	Discussion	Issues	Follow up			
February 1, 2008 to September 24, 2008	Various Chevron Representatives	Meetings, E-mail and Phone Calls	Intergrated Land Management meetings with Chevron to discuss proposed access road partnership.	N/A	Chevron has declined and the Chevron Ells River Project is on hold.			
October 31, 2008	Surface Land	Newsletter	Mailed out the proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review.	N/A	N/A			
December 18, 2008	Surface Land	Newsletter	Mailed out the updated proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review.	N/A	N/A			
March 30, 2010	Surface Land	Newsletter	Sunshine sent a revised newsletter to all stakeholders detailing the updated footprint and providing a description of Phase 1 and 2 of the proposed West Ells SAGD Project.	N/A	N/A			

Sunshine Oilsands Ltd. West Ells SAGD Project Consultation Log EnCana Corporation

Summary of activities to date: Discussions regarding the proposed West Ells SAGD Project location, size and access requirements. Communication with EnCana Corporation is ongoing and Sunshine will provide further updates as dialogue continues.								
Date	Name	Forum	Discussion	Issues	Follow up			
October 31, 2008	Surface Land Department	Newsletter	Mailed out the proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review.	N/A	N/A			
December 18, 2008	Surface Land Department	Newsletter	Mailed out the updated proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review.	N/A	N/A			
March 30, 2010	Surface Land Department	Newsletter	Sunshine sent a revised newsletter to all stakeholders detailing the updated footprint and providing a description of Phase 1 and 2 of the proposed West Ells SAGD Project.	N/A	N/A			

Sunshine Oilsands Ltd. West Ells SAGD Project Consultation Log ERCB (Energy Resource and Conservation Board)

Summary of activities to date: Discussions regarding the proposed West Ells SAGD Project location, size and access requirements. Communication with ERCB is ongoing and Sunshine will provide further updates as dialogue continues.							
Date	Name	Forum	Discussion	Issues	Follow up		
September 9, 2008	ERCB	Meeting	Meeting to discuss the West Ells SAGD project concept and proposed submission date.	N/A	N/A		
October 31, 2008	ERCB	Newsletter	Mailed out the proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review.	N/A	N/A		
December 18, 2008	ERCB	Newsletter	Mailed out the updated proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review.	N/A	N/A		
January 20, 2009	ERCB	Meeting	Meeting to discuss progress of the West Ells SAGD Project application.	N/A	N/A		
March 30, 2010	ERCB	Newsletter	Sunshine sent a revised newsletter to all stakeholders detailing the updated footprint and providing a description of Phase 1 and 2 of the proposed West Ells SAGD Project.	N/A	N/A		

Sunshine Oilsands Ltd. West Ells SAGD Project Consultation Log Grizzly Oilsands ULC

Summary of activities to date: Discussions regarding the proposed West Ells SAGD Project location, size and access requirements. Communication with Grizzly Oilsands ULC is ongoing and Sunshine will provide further updates as dialogue continues.								
Date	Name	Forum	Discussion	Issues	Follow up			
October 31, 2008	Surface Land	Newsletter	Mailed out the proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review.	N/A	N/A			
November 19, 2008	Surface Land	E-Mail	E-mailed detailed project mapping to Grizzly requesting a letter of support for the West Ells SAGD Project and associated access road with a response requested by Nov 26, 2008	No response	Place follow up phone calls			
November 28, 2008	Surface Land	Phone Call	Call to Grizzly regarding letter of support. Grizzly to send letter of support for West Ells Project.	Support letter never received	N/A			
December 18, 2008	Surface Land	Newsletter	Mailed out the updated proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review.	N/A	N/A			
March 30, 2010	Surface Land	Newsletter	Sunshine sent a revised newsletter to all stakeholders detailing the updated footprint and providing a description of Phase 1 and 2 of the proposed West Ells SAGD Project.	N/A	N/A			

Sunshine Oilsands Ltd. West Ells SAGD Project Consultation Log **Grizzly Diamonds Ltd.**

Summary of activities to date: Communication regarding the proposed West Ells SAGD Project location, size and access requirements. Communication with Grizzly Diamonds Ltd. is ongoing and Sunshine will provide further updates as dialogue continues.								
Date	Name	Forum	Discussion	Issues	Follow up			
October 31, 2008	Grizzly Diamonds Ltd.	Newsletter	Mailed out the proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review.	N/A	N/A			
December 18, 2008	Grizzly Diamonds Ltd.	Newsletter	Mailed out the updated proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review.	N/A	N/A			
March 30, 2010	Grizzly Diamonds Ltd.	Newsletter	Sunshine sent a revised newsletter to all stakeholders detailing the updated footprint and providing a description of Phase 1 and 2 of the proposed West Ells SAGD Project.	N/A	N/A			

Sunshine Oilsands Ltd. West Ells SAGD Project Consultation Log **MD of Opportunity # 17**

Summary of activities to date: Communication regarding the proposed West Ells SAGD Project location, size and access requirements. Communication with MD of Opportunity is ongoing and Sunshine will provide further updates as dialogue continues.						
Date	Name	Forum	Discussion	Issues	Follow up	
October 31, 2008	Land Use Officer	Newsletter	Mailed out the proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review.	N/A	N/A	
December 18, 2008	Land Use Officer	Newsletter	Mailed out the updated proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review.	N/A	N/A	
March 30, 2010	Land Use Officer	Newsletter	Sunshine sent a revised newsletter to all stakeholders detailing the updated footprint and providing a description of Phase 1 and 2 of the proposed West Ells SAGD Project.	N/A	N/A	

Sunshine Oilsands Ltd. West Ells SAGD Project Consultation Log **Nova Gas Transmission Ltd.**

Summary of activities to date: Communication regarding the proposed West Ells SAGD Project location, size and access requirements. Communication with Nova Gas Transmission Ltd. is ongoing and Sunshine will provide further updates as dialogue continues.						
Date	Name	Forum	Discussion	Issues	Follow up	
October 31, 2008	Surface Land Manager	Newsletter	Mailed out the proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review.	N/A	N/A	
December 18, 2008	Surface Land Manager	Newsletter	Mailed out the updated proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review.	N/A	N/A	
March 30, 2010	Surface Land Manager	Newsletter	Sunshine sent a revised newsletter to all stakeholders detailing the updated footprint and providing a description of Phase 1 and 2 of the proposed West Ells SAGD Project.	N/A	N/A	

Sunshine Oilsands Ltd. West Ells SAGD Project Consultation Log Paramount Energy Operating Trust (PEOC)

Summary of activities to date: Communication regarding the proposed West Ells SAGD Project location, size and access requirements. Communication with Paramount Energy Operating Trust is ongoing and to date no objections have been received. Sunshine will provide further updates as dialogue continues.						
Date	Name	Forum	Discussion	Issues	Follow up	
October 31, 2008	Surface Land Manager	Newsletter	Mailed out the proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review.	N/A	N/A	
December 18, 2008	Surface Land Manager	Newsletter	Mailed out the updated proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review.	N/A	N/A	
March 30, 2010	Surface Land Manager	Newsletter	Sunshine sent a revised newsletter to all stakeholders detailing the updated footprint and providing a description of Phase 1 and 2 of the proposed West Ells SAGD Project.	N/A	N/A	

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Sunshine Oilsands Ltd. West Ells SAGD Project Consultation Log Suncor Energy

Summary of activities to date: Communication regarding the proposed West Ells SAGD Project location, size and access requirements. Communication with the Suncor is ongoing regarding use of their McKay River access road and intersection to Highway 63. Sunshine will provide further updates as dialogue continues.						
Date	Name	Forum	Discussion	Issues	Follow up	
October 31, 2008	Suncor Energy	Newsletter	Mailed out the proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review.	N/A	N/A	
December 18, 2008	Suncor Energy	Newsletter	Mailed out the updated proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review.	N/A	N/A	
March 5, 2009 to present	Suncor Energy	Ongoing Meetings	Sunshine has attended ongoing meetings and contributed to a group TIA (Traffic Impact Assessment) submission which was submitted to Alberta Transportation for approval on September 14, 2009. Suncor is also a participant in the working group.	N/A	N/A	
March 30, 2010	Suncor Energy	Newsletter	Sunshine sent a revised newsletter to all stakeholders detailing the updated footprint and providing a description of Phase 1 and 2 of the proposed West Ells SAGD Project.	N/A	N/A	

Sunshine Oilsands Ltd. West Ells SAGD Project Consultation Log **Total E&P Canada Ltd.**

Summary of activities to date: Communication regarding the proposed West Ells SAGD Project location, size and access requirements. Communication with Total is ongoing and Sunshine will provide further updates as dialogue continues.						
Date	Name	Forum	Discussion	Issues	Follow up	
October 31, 2008	Surface Land Manager	Newsletter	Mailed out the proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review.	N/A	N/A	
December 18, 2008	Surface Land Manager	Newsletter	Mailed out the updated proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review.	N/A	N/A	
November 5, 2009	Surface Land Manager	E-mail	E-mail to Sunshine informing that the newsletter was received and distributed widely throughout Total for review.	N/A	N/A	
November 19, 2008	Civil Construction Manager	E-mail	E-mail and detailed project mapping to Total requesting a letter of support for the West Ells SAGD Project and associated access road with a response requested by November 26, 2008	No response	Place follow up phone call.	
November 19, 2008	Civil Construction Manager	Phone Call	Call requesting clarification on letter of support request. Total's response expected in one week's time.	Total looking at other potential access options.	N/A	
April 22, 2009	Civil Construction Manager	Phone Call E-mail	Call regarding the proposed High Grade Access routing into the West Ells Project area. Total presented Sunshine with another option for review.	Additional River Crossing required to access West Ells, not desirable at this time.	Nothing at this time, will review additional access options if and when they are become available.	
March 30, 2010	Civil Construction Manager	Newsletter	Sunshine sent a revised newsletter to all stakeholders detailing the updated footprint and providing a description of Phase 1 and 2 of the proposed West Ells SAGD Project.	N/A	N/A	

Sunshine Oilsands Ltd. West Ells SAGD Project Consultation Log **RM of Wood Buffalo**

Summary of activities to date: Communication regarding the proposed West Ells SAGD Project location, size and access requirements. Communication with RM of Wood Buffalo is ongoing and Sunshine will provide further updates as dialogue continues.						
Date	Name	Forum	Discussion	Issues	Follow up	
October 31, 2008	General Manager of Planning and Development	Newsletter	Mailed out the proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review.	N/A	N/A	
December 18, 2008	General Manager of Planning and Development	Newsletter	Mailed out the updated proposed Sunshine West Ells SAGD Project and high grade road application informational newsletter for review.	N/A	N/A	
March 5, 2009 to present	Industry Traffic Impact Assessment (TIA) Working Group	Ongoing Meetings	Sunshine has attended ongoing meetings and contributed to a group TIA submission which was submitted to Alberta Transportation for approval on September 14, 2009. The RM of Wood Buffalo is also a participant in this working group.	N/A	N/A	
March 30, 2010	General Manager of Planning and Development	Newsletter	Sunshine sent a revised newsletter to all stakeholders detailing the updated footprint and providing a description of Phase 1 and 2 of the proposed West Ells SAGD Project.	N/A	N/A	



VOLUME 1

OCTOBER /2008

Sunshine Oilsands Ltd. ("Sunshine"), formed in February 2007, is an oil sands company holding over 1 million (1,000,640) acres of oil sands mineral leases in the Athabasca Region in Alberta.

Our team of dedicated professionals is currently preparing applications for Phase 1 West Ells SAGD production of 10,000 bbl/day. We expect to file this application in December 2008.

This newsletter is the first edition of an ongoing series of newsletters designed to provide useful insights into our company and to give our stakeholders information. The newsletter will also provide a way for everyone involved in our projects to provide Sunshine with useful and constructive feedback.

STAKEHOLDER AND COMMUNITY CONSULTATION POLICY

Our community and stakeholder engagement strategy is simple and is outlined below:

- Facilitate open and effective communication with members of the public, regulatory bodies and industry who are, or may be, directly related to our proposed exploration and/or development activities;
- Provide communities and stakeholders with clear and timely information;
- Ensure that a transparent, respectful relationship is built and maintained with neighbors and key stakeholders in the area;
- Seek input into the design of the consultation process to ensure the communication and consultation needs of the neighbors are met;
- Establish a high level of inclusiveness when indentifying those who may have an interest in our activities or proposed activities.

SUNSHINE BELIEVES THAT CONSULTATION WORKS BEST WHEN PROACTIVE COMMUNITY AND STAKEHOLDER ENGAGEMENT OCCURS.

Sunshine is in the process of completing the West Ells Phase 1 SAGD 10,000 bbl/d application. The proposed project area is located approximately 60kms west of Fort McKay, 200 km south west of Fort Chipewyan, 50 km east of Chipewyan Lake and 155 km north east of Wabaska.

The Phase I SAGD development area, including well pads, the central plant facility, pipelines and camps will be located across sections 30 and 31 on 94-17W4M and will occupy about 61 hectares of land. The proposed Sunshine north/south access road from the proposed Athabasca Oil Sands Dover Facility in section 6-9-94-17W4M will utilize another 68 hectares. (Page 3 of the newsletter provides an overview map of the project location and the high grade multi-use road access)

The Sunshine West Ells project will extract bitumen using SAGD technology. The first phase will see 12 horizontal well pairs closely placed on two well pads in section 30 and 31on 94-17W4M. This is a very small foot print and much more environmentally friendly than Mining, which Sunshine will not do. From the well head, bitumen will be transported by a pipeline to the proposed central plant facility to be located in the NW and NE section of 31-94-17W4M for processing. From the plant storage tanks the bitumen will be trucked to market. Is should be noted that the Sunshine West Ells Facility will use "state of the art technology" and will re-use 95% to 98% of the water that will be taken from underground.

This diagram shows that the Facility will not use surface water but will extract water from deep underground. The underground water withdrawal will not affect surface aquifers.

DBM



Schematic cross-section

WEST ELLS PHASE 1 APPROVAL TIMELINE



MULTI USE HIGH GRADE ACCESS ROAD

Sunshine and various other area operators are currently reviewing the need for a high grade (all weather) access road into the West Ells area. Permanent all weather access is a requirement for this project for various reasons WITH THE TWO PRIMARY REASONS BEING: year round access and safety.

Sunshine would like to ensure that stakeholder comments are reviewed prior to regulatory submission. In an effort to be proactive and to generate area stakeholder dialogue regarding this proposed high grade access road, Sunshine is actively seeking feedback regarding this proposed access and we look forward to your comments.

The map below provides an overview of the proposed West Ells Phase 1 project location and the proposed multi-use high grade road location and relative distances to various locals.



SUNSHINE OILSANDS WINTER 08-09 ACTIVITIES

In addition to the West Ells Phase 1 pilot submission in December of this year, Sunshine Oilsands is actively engaged in exploration of our oil sands mineral leases and will be working in the following areas:



We hope that this first edition of the Sunshine Oilsands "Light on the Horizon" Newsletter is useful and informative.

If you require any further information regarding anything contained in this newsletter do not hesitate to contact:

Jason Hancheruk, VP Regulatory, Environment and Stakeholder Affairs 780.464.2933 (office) 780.405.1532 (cell) jhancheruk@sunshineoilsands.com





SUPPLEMENTAL

DECEMBER / 2008

About the West Ells Phase 1 SAGD Project

The bitumen resources at our West Ells Phase 1 SAGD project are located approximately 250 meters below the surface and will be extracted by proven SAGD (Steam Assisted Gravity Drainage) technology. Further expansion at West Ells is



proposed to include West Ells Phase 2 which is forecasted for completion by 2015 and will provide an additional 30,000 bbl/d of production and the company anticipates West Ells Phase 3 will add another 25,000 bbl/d of production by 2018.

The West Ells Phase 1 SAGD facility will include two well pads, (each with 6 or 7 horizontal well pairs), high grade access road, above ground pipelines and a central processing facility (CPF). At the CPF, the bitumen will be cleaned and diluted with condensate before it is transported via trucks, to an upgrader, where it will be refined into synthetic crude and other petroleum products.

The project will produce up to 10,000 barrels of bitumen per day for 25 years, add provide direct and indirect employment to approximately 40—65 people. See page 2 of this supplement for Phase 1 footprint details.

Stakeholder Fast Facts:

Surface Disturbance: The SAGD process greatly minimizes surface disturbance by horizontally drilling well pairs from one small pad location.

Air Quality: Levels of 'sulphur dioxide' and 'nitrous oxide' emissions will be strictly controlled to meet Alberta's air quality guidelines.

Water: Storm water will be collected and stored on-site in ponds. 95% of the water used in the SAGD process will be recycled water form the SAGD process.

Reclamation: At the end of the project's life, Sunshine Oilsands will decommission the plant and well pads in accordance with an Alberta Environment approved conservation and reclamation plan.

West Ells SAGD Project Footprint




April 1, 2010

Via Registered Mail

Attention: West Ells SAGD Project Stakeholders

Re: West Ells SAGD Application Newsletter

Sunshine Oilsands Ltd. ("Sunshine") is in the process of submitting the West Ells SAGD Application ("the Project") to the Energy Resource Conservation Board ("ERCB") and Alberta Environment ("AEV) for review and approval. This in-situ bitumen recovery project is proposed to proceed in two phases of 5,000 barrels per day (bpd) each and approval is being sought for the entire Project for up to 10,000 bpd.

Previous newsletters were sent out in October and December of 2008 which outlined a 10,000 bpd West Ells SAGD Project with only one Phase. After further review of the area, Sunshine has determined that there is a need for additional well pads and infrastructure to sustain the 10,000 bpd of bitumen production level for 25 years.

What stays the same?

• Phase 1 of the Project is exactly the same as noted on previous newsletters

What has been added?

 Proposed Phase 2 future well pads, infrastructure and borrow pits have been added to the footprint

This newsletter has been designed to provide plain language information to all stakeholders affected by our West Ells SAGD Project and in the weeks ahead, it will be followed by a Public Notification of Application in local papers, Directive 23 and 56 Notifications (as per the applicable ERCB directives) and delivery of hard copy packages of the application document for further review.

Best regards,

Jason Hancheruk Sunshine Oilsands Ltd.

HEAD OFFICE

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Visit us online at: www.sunshineoilsands.com

West Ells SAGD Project Update

Sunshine Oilsands Ltd. ("Sunshine") will be applying to the Alberta Energy Resources Conservation Board ("ERCB") and Alberta Environment ("AENV") with an integrated application (the "Application") for regulatory approval for the construction, operation, reclamation and related water use for the West Ells Steam Assisted Gravity Drainage ("SAGD") in-situ bitumen recovery project. Although the Project will proceed in two phases of 5,000 barrels per day (bpd) each, approval is being sought for the entire Project of up to 10,000 bpd. This integrated Application contains information required in accordance with the *Oil Sands Conservation Act.* ("OSCA"), the *Environmental Protection and Enhancement Act* ("EPEA"), the *Pipeline Act* and the *Water Act*.

The West Ells Project is located in Township 94, Ranges 17 and 18 W4 Meridian, as shown on the map below, will be capable of producing up to 1600 m3/day (10,000 bpd) of bitumen from the Wabiskaw Zone over a period of 25 years. Multiple well pairs will be drilled from individual well pads to reduce surface disturbance. Sunshine anticipates that over the course of the Project, approximately 80 well pairs will be drilled from up to 9 well pads. For reference purposes, site specific details are outlined on page 2 and the projected timeline for construction and operational activities is located on page 3.



Phased Development and Benefits

Central Plant Facility and Access Road (Phase 1) - As shown in *blue* and *brown* in the diagram below, the Project will require an all weather access road and Central Plant Facility (CPF) to be constructed which will allow for processing and transportation of bitumen to market. Produced bitumen from the SAGD well pairs, as outlined below, will be transported via infield pipelines to the CPF in preparation for transportation to market via truck. At this time there are no plans for onsite upgrading facilities to be associated with this project.

SAGD Well Pads 1 and 2 (*Phase 1***)** - The pads and access shown in *purple* below, will be constructed and developed first in this phased approach. Up to 13 SAGD well pairs will be drilled from these pads. Anticipated production from pads 1 and 2 is 2,000 to 5,000 bpd of bitumen, depending on individual well performance.

SAGD Well Pads 3 and 4 (Phase 2) - In order to bring the project up to the full 10,000 bpd production level, an additional 2 well pads, as shown in *red* below, will be required to be constructed. It is anticipated that up to 18 SAGD well pairs will be drilled from these pads.

SAGD Well Pads 5 thru 13 (Infill Pads) - The pads and access as shown in *green* and *grey* below, will be required in the future to maintain the 10,000 bpd production level of the Project for its projected 25 year life span. The required number of these infill pads and SAGD well pairs will depend on the well performance experienced during Phases 1 and 2. The total number of SAGD wells pairs that will be required to sustain the 10,000 bpd Project for 25 years is approximately 80.

Specific benefits of the West Ells Project will include the following:

- The Project will employ an operating workforce of approximately 30-40 people for the Project's first and second phases;
- during construction, the Project is expected to employ an average work force of approximately 150 people, peaking at 250 people;
- for 25 years, there will be sustained on-site activity in the West Ells area and significant opportunities for local training and employment will exist throughout the life of the Project.



Sunshine's consultation objectives are as follows:

- Facilitate open and effective communication with all stakeholders, including but not limited to, members of the public, regulatory bodies and industry who are, or may be, affected by the proposed exploration and/or development activities;
- Provide aboriginal communities and stakeholders with clear and timely information;
- Ensure that a transparent, respectful relationship is built and maintained with neighbours and stakeholders throughout the Project area;
- Seek input into the design of the consultation process at the onset to ensure that communication and consultation needs are met; and
- Establish a high level of inclusiveness when indentifying those who may have an interest or be potentially
 impacted by Sunshine's activities or proposed activities.

Sunshine believes that consultation works best when proactive community and stakeholder engagement occurs and as such we look forward to continue building relationships with our stakeholders throughout the area.

Please reference the chart below for the anticipated West Ells SAGD Project approval and construction timeline.





Contact Information

For more information on our company or our West Ells SAGD project application, please contact:

Jason Hancheruk,

VP Regulatory, Environment and Stakeholder Affairs 780.464.2933 (office) 780.405.1532 (cell) 780.464.7662 (fax) Email: jhancheruk@sunshineoilsands.com Corporate website: www.sunshineoilsands.com

Appendix 5 Measurement Principles

Description of Proposed Operating Procedures

Calibration

Sunshine will utilize industry accepted practices for the proving, calibration and verification of its accounting meters for West Ells Project. Where flow meters require proving, the meters may be removed from service and bench proved. Due to fluid characteristics and high operating temperatures, proving meters in line is not practical. Where practical to prove in line, Sunshine will choose to do so.

The calibration frequency assigned to all accounting meters is once per year at minimum after the initial calibration/proving following start-up. Calibration/proving frequencies may be adjusted to a more frequent basis subject to identified business needs, or if operations determine that the plant balances are not within acceptable tolerances. Calibration and verifications will include inspections of orifice plates and or meter internals as appropriate. For example; measurement of sales dilbit (diluent/bitumen mixture) may be proved on a quarterly basis rather than an annual basis. This is not accounting meter for ERCB purposes, however, It is in Sunshine's best interest to maintain tight controls on this measurement point.

The meters utilized at this facility consist of orifice meters, turbine meters, vortex meters, coriolis meters and magnetic meters.

Gauging

Tank gauging of production and storage tanks will be done using either radar level measurement devices or differential pressure measurement. The following tanks will have their levels monitored as part of the accounting process as the levels in these tanks will fluctuate:

Oil Production Tank Sales Oil Tank Off-Spec Oil Tank Slop Tank Waste Water Tank Source Water Tank All other tank inventories will be considered part of the process as the tank levels are maintained at fairly constant levels by process control. Tank inventories of the diluent tank will also be monitored, however its volumes is not part of the facility accounting process.

Tank inventories readings will meet ERCB resolution requirements of 75 mm or better with all volumes reported to the nearest 0.1 m^3 . Tank volume tables provided by the manufacturer will be available upon request.

Gauging of surface pit levels will be done using depth gauges. The pits will be used for surface run-off control with proper testing of fluids prior to pit draining.

Trucking

Truck receipts at the facility will only consist of diluent for process blending. At this time there are no plans to accept any trucked-in produced volumes at the project. The diluent is a royalty paid spec product and therefore measurement of the product receipts does not affect the accounting at the facility. Receipt volumes will be determined by meter at the truck loading station and by monitoring tank level changes in the diluent storage tanks. BS&W of diluent receipts will be monitored by taking samples of each truckload and manually determining a water cut of the received product.

Trucked-out volumes will be metered at the receipt point, the pipeline terminal. Metering at this point will be the responsibility of supplier. It is Sunshine's understanding and expectation that the metering at this inlet will meet industry standards for custody transfer receipt point measurement.

The only other trucked volumes at this facility will be waste products such as water treatment waste water, slop tank bottoms and sand from the de-sanding tank. These volumes will be trucked to a licensed ERCB waste facility with volumes delivered being metered and allocated in accordance with ERCB standards.

Sediments and Water (S&W) Procedures

The test separators located at the pads will be equipped with Phase Dynamics BS&W monitors along with coriolis meters. The BS&W monitors are Full Range models with an accuracy of +/-0.5% of for the oil phase and +/-1.0% for the water phase. The range of the BS&W units is 0-100% water cut with a resolution of 0.1%.

The Phase-Dynamics monitor utilizes modern microwave technology to determine water cuts. The electrical characteristics of the water and the oil are very different and this provides the means to clearly determine the water content. An electrical signal is sent from the electronics on the end of the measurement section down through the fluids. This generates a standing wave similar to the vibrations of a rubber band held at both ends and plucked. This standing wave changes position within the section as the water content changes. The change in position is automatically detected by the microwave oscillator that originally sent out the signal and it changes its basic frequency depending upon how much water is in the section. In summary, the sending and receiving portion of the electronics are the same and they change the frequency with respect to water content.

The patented measurement method which allows the oscillator to change frequency with the changing water cut provides for up to 1,000 times the sensitivity than other technologies. This is the reason that water continuous measurements in the high water cut region can be done. Prior methods just did not have the sensitivity to water in the 60-90% water cut regions. This same method gives long term reproducibility and stability of measurement because of the simplicity of the circuitry.

The devices used at this facility (Phase-Dynamics Model LL1R2040-EX032B) are designed for temperature ranges up to 204 °C and 1345 kPag. The actual operating conditions will be 170 °C and 1,000 kPag.

The coriolis meter can also be used to determine water cuts and will be used as a secondary device to confirm the readings obtained from the water cut monitor. The water cut monitors will be calibrated annually, the same frequency as the coriolis meters used for accounting measurement.

The sales oil water cut determination will be done at the receipt point.

The water cut determination of the trucked in diluent will be done by manual sampling and spinning the cuts of each load. As the diluent is a royalty paid product, only diluent actually injected into the process bitumen stream affects the accounting calculations. Operators will monitor the diluent receipts and the diluent tank for water content. If water is found in the loads or accumulates in the tanks, the water will be removed and disposed of. As the diluent is a spec product, no water is expected in the diluent receipts.

Well Test Criteria

Well testing at SAGD operations can be quite dynamic. Results will be variable for the first six months of production as the reservoir is heated up and as facility operations are stabilized. The plant is designed to allow for two tests per well per month. Well test durations will be 24 hours including stabilization and purge times. Sunshine plans to conduct two 24-hour tests per month if conditions permit when operations begin. As further information is gathered, testing durations and frequencies will be modified to obtain representative well test information. This testing

scheme will be optimized as information is gathered to ensure quality test data is obtained in as efficient a manner as possible in order to optimize reservoir management and resource recovery.

With well production stabilized, it is anticipated that operators will use a tolerance band of +/-10% for flagging test results. Any test results outside this band, when compared to the most recent test, must be reviewed and accepted or rejected by the operator. The 10% band is used for volumetric comparisons as well as for water cut comparisons.

If there is a mechanical failure or interruption during a test period (e.g. loss of steam etc.) the test will be voided and another test will be started as soon as practical.

Load Fluid Recovery

Load fluid handling will be conducted in accordance with ERCB requirements. Load fluids will be recovered before any production of the same type of fluid is reported for the well. Load fluid recovery rates will be monitored using the well test separator where practical, or where this is not practical, the load fluid recovery will be based on the most recent test available, and monitoring of production volumes from the subject production pad.

Common Flow Lines

There are no common flow lines for the wells in this field.

Field Headers

There are no field headers requiring purging procedures in this field. All wells are part of a production pad, and all wells produce to either the test header on the pad or to the group header on well pad. Purging of the test lines tied to the test header will be done prior to each well test. Purge periods will be calculated based on expected well production rates, and the amount of line and test vessel volume that must be displaced.

Casing Head Gas

Sunshine is not planning to produce any casing head gas that may be associated with this project.

Lift Gas

Lift Gas, if ever used, is a royalty paid product purchased from an outside source. Sunshine will be metering lift gas for each well's heel and toe injection point. The lift gas volumes will be netted off the total battery well production to determine the actual gas production from the producing wells.

Accounting Calculations

Well Test Bitumen Production

Bitumen = Emulsion meter reading - (Emulsion meter reading x WC%)

WC% = water cut from water cut monitor

Well Test Water Production

Water = Emulsion meter reading x WC%

Well Test Gas Production

Gas = Well test bitumen Production x Facility GOR

Total Battery Bitumen Production

Produced Bitumen = $((O_{BS} + IC)/SF) - D_i$

Where:

 O_{BS} = Blended Sales Oil delivered from facility

IC = Inventory Change

SF (Blending Shrinkage Factor) = (100 - %Shrinkage) / 100

 D_i = Diluent injected during process

% Shrinkage = 2.69 x $10^4 xC (100 - C)^{0.819} x (1/d_L - 1/d_H)^{2.28}$

Where:

C= Concentration in Liquid volume % of diluent

 $d_{\rm L}$ = density of diluent

 $d_{\rm H}$ = density of bitumen

Estimated Bitumen Production

Estimated Bitumen = $\sum P_1 \dots P_n$

Where:

March 2010

 P_1 = estimated bitumen production for well 1 based on well tests

 P_n = estimated bitumen production for well n based on well tests

Battery Proration Factor

PF = Produced Bitumen / Estimated Bitumen

Facility Source Water

Source water will be metered at each source well and at the source water inlet. Other points such as water disposal, boiler feed water and boiler blow down will also be metered. Those single point measurements will meet a maximum single point measurement uncertainty of 2.0%

Total Battery Water Production

Water production will be metered

Recycle Rate

Recycle Rate (%) = ((SINJ – (FWIN - FWOther))/Produced Water) x 100

Where:

SINJ = Measured total steam delivered into the steam pipelines

 FW_{IN} = Measured total fresh source water used

FW_{other} = Estimated Produced Fresh water used for other purposes (e.g. floor washing, fire suppression etc).

Produced Water = Battery Water Production

Total Battery Gas Production

Produced Gas = Produced Gas Separator Meter + FWKO Meter + Treater Meter +VRU discharge meter – Blanket Gas Meter – Makeup gas meter – Flashed Diluent – Meter of Optional Gas Lift.

Flare Gas:

All vessels with gas overhead streams to flare will be equipped with meters. Emergency Flare Volumes will be measured using non intrusive metering (thermal mass flow meter) on the flare system. The anticipated flare volumes for each emergency case will be estimated prior to startup.

Fuel Gas:

Fuel Gas = Receipts + Produced Gas – Flare Gas

Receipt Gas:

Purchased Gas from TCPL

Battery GOR

Battery GOR = Produced Gas / Total Battery Bitumen Production

Steam Injection Volumes

Total steam = \sum (meters on the discharge of each steam generator).

Estimated Wellhead Injection = \sum (individual wellhead meters)

Injected Steam Proration Factor (ISPF) = Total Steam/ Estimated Wellhead Injection

Actual Wellhead Injection = Estimated Wellhead Injection X ISPF

Accounting Methodologies

Water Vapour in Gas Streams

Steam saturated gas streams will not be used for accounting purposes. Gas production will be based on GOR's determined on a battery basis and accounting gas measurement points will be operating below the 100oC temperature range.

Volumetric Shrinkage due to Blending

Blending calculations will be based on the standards set out API Chapter 12.3 utilizing the following formula:

% Shrinkage = $2.69 \times 10^4 \times C (100 - C)^{0.819} \times (1/d_L - 1/d_H)^{2.28}$

Where:

C = Concentration in Liquid volume % of diluent

dL = density of diluent

dH = density of bitumen

To determine the shrinkage, add the diluent volume plus the bitumen production and multiply by (100 - %Shrinkage) / 100.

March 2010

Diluent Shrinkage Due to Treating

Diluent being utilized at the project is added to the production stream at two distinct phases. The first phase is the processing phase, where diluent is added to the emulsion stream feeding the FWKO and the treater. The second phase is trim blend added to the production stream to meet pipeline specifications during shipping operations.

Only the volumes added to the processing stream will be subject to any treating shrinkage. It is anticipated that the diluent will be approximately 25% of the total plant output.

The diluent (subject to shrinkage due to treating) will flash to some degree resulting in a density change for blending purposes. This change in density will have a minimal effect at the blend rates anticipated. Based on our engineering calculations using a liquid-vapour simulation program, the shrinkage difference will be in the range of 0.05%, which is not significant in the overall facility accounting.

The diluent compositions will change, depending on the source of the diluent. Sunshine will monitor shrinkage utilizing process software to monitor flashing of diluent light ends and where the volumes are material to the plant accounting (>0.5%), appropriate adjustments will be made.

Unmetered Gas Streams

There are no unmetered gas streams.

Gas in Solution

As all gas streams are collected and metered, there are no gas in solution volumes leaving the stock tanks that are not accounted for. Additionally with the use of a properly determined GOR for determining estimated gas production, no adjustments for gas in solution are implemented.

Injectivity Tests at Well 7-36 and 14-31

Yanguang Yuan, "YY" BitCan Geosciences & Engineering Inc. Calgary, CANADA

April 4, 2008

Hydraulic fracturing for in-situ stress measurement



Figure 3-23. Downhole pressure during a micro-hydraulic fracturing test. (Thiercelin and Roegiers, 2000)

6-2

Fracturing in the oil sands

- Fracturing in the oil sands is a combination • of shear dilation and tensile micro-cracking.
- The dilation happens earlier than the parting.



291 m

293 m

Well injectivity tests

- 2 perforation intervals at each well: cap rock and oil sands.
- Bull-head injection with a packer set between the 2 intervals.
- To measure the in-situ minimum stress.
- To acquire quality BHP vs. rate data for historymatching.



Well 14-31, oil sands at 270 mTVD



Characteristic pressures

- Breakdown/frac re-opening
- Frac propagation
- Instantaneous shut-in
- Frac closure





Fracture closure pressures:

- p vs. sqrt(t)
- G plot
- Horner plot

Fracture re-opening pressure and propagation pressure





• Fracture re-opening:

- Deviation pt. from initial straight line on p-rate (vln) plot.
- Transition for wellbore fluid from being pressurized to flowing into the fracture.
- Fracture propagation pres.
 - An average pres for the flat or fluctuating period on p-t plot.





Half-slope on log-log plot to check on linear flow regime









Near-well friction and perforation friction during injection



Figure 6-17. Nonalignment of perforations and the fracture plane causes pinch points.



From (Economides and Nolte, 2000)

Step-rate down test in cycle #4



Step-rate test in cycle #1



6-15

Pressure rebound from flow-back tests



- Used in testing low-permeability rocks such as shale to accelerate the fracture closure.
- Manually withdraw certain amount of fluid from the wellbore, forcing the fracture to close near the well.
- Pressure rebounds after the flow-back stops, approaching the closure pressure.

Well 14-31, oil sands at 270 mTVD



Variation of the characteristic BHP's with injection/shut-in cycles --- well 14-31, oil sands



Effective water mobility interpreted from the p-decline data



Well 7-36, oil sands at 269 mTVD



Variation of the characteristic BHP's with injection/shut-in cycles --- well 7-36, oil sands



Horner plot shows a gradually increasing water mobility



Near-wellbore friction probed in cycle #6, well 7-36



6-23

Benchmark against other measurements


Summary on tests in oil sands

- In-situ minimum stress in the payzone is ~ 17 kPa/m:
 - Well 14-31: <u>4.54 to 4.87 MPa</u> or <u>16.6 to 17.8 kPa/m</u>
 - Well 7-36: <u>4.34 to 4.56 MPa</u> or <u>16.1 to 17.3 kPa/m</u>
 - The result compares well with BitCan's database.
- Therefore, a vertical fracture is formed and the minimum stress is horizontal in the oilsands payzone.
 - Further supported by the fact that the fracture propagation pressure is lower than the OB weight during later cycles of injections.
- Effective water mobility increases to ~120 md/cp after the dilation/fracturing process, showing significant effect from geomechanical dilation mechanism.

Summary on well 7-36, oil sands (cont'd)

- Near-wellbore tortuosity in the fluid path from the wellbore to the fracture causes 0-2 MPa friction loss during the injection, depending on the injection rates (0-30 l/min).
- Interpretation uncertainty does exist:
 - Linear flow regime during the shut-in is not obvious on the loglog plot.
 - G-plots are not well-behaved as the conventional hard-rock fracturing.
- The ambiguity may be caused by a large dilated and thus mobility-enhanced region vs. linear fractures in the hard rock. will be investigated/clarified in future geomechanical history-matching.

Well 14-31, cap rock shale at 247 mTVD



Cycles #1 vs. #3



Low propagating pressures after Cycle #3



Consistent p. rebound from flow-back tests



Consistent p. rebound from flow-back tests (cont'd)



Step-rate down test in cycle #8, cap rock, well 14-31



6-32

Variation of the characteristic BHP's with injection/shut-in cycles --- well 14-31, cap rock



Low-perm inferred from Horner plot before breakdown in cycle #3









Summary on well 14-31, cap rock

- Unequivocally, the in-situ minimum stress is similar to the overburden stress, i.e., 5.47-5.61 MPa or 22 kPa/m. Thus, a horizontal fracture is created during the test.
- The formation is stiffer compared to the oil sands:
 - Higher peak pressures (15-16 MPa)
 - Significant breakdown (9-MPa pressure drop).
 - Low water mobility (<2 md).
- Near-wellbore friction is not significant due to the "violent" breakdown (9-MPa p. drop).

Well 7-36, cap rock shale at 248 mTVD



Step-rate down test in cycle #3, cap rock, well 7-36



Variation of the characteristic BHP's with injection/shut-in cycles --- well 7-36, cap rock



Summary on well 7-36, cap rock

- The in-situ minimum stress is 5.75 MPa or 23 kPa/m@248 mTVD, similar to, although slightly larger than, the overburden stress: 5.45 MPa or 22 kPa/m.
- Thus, a horizontal fracture is created during the test.
- The small difference between the minimum stress and OB weight may be caused by slight inclination of the fracture w.r.t. the vertical stress. This also explains the relatively large near-wellbore friction (up to 2 MPa) at 7-36 compared to 14-31.



Tests in the cap rock, wells: 7-36 vs. 14-31

- Compared to 14-31, the test in the cap rock at 7-36 has different pressure behaviour:
 - Lower peak pressures before the breakdown: 10 MPa vs. 16 MPa.
 - Less pressure drop at the breakdown: 2 MPa vs. 9 MPa.
 - Higher pressures after the breakdown: >8 MPa vs. ~6 MPa.
 - More significant near-wellbore friction.



Cap rock, wells: 7-36 vs. 14-31



Well 14-31, cap rock vs. oil sands





• A horizontal fracture is created in the cap rock shale.



APPENDIX 7 TECHNICAL MEMORANDUM DRAFT



Golder Associates Ltd. 1000, 940 – 6th Avenue S.W. Calgary, AB, Canada T2P 3T1

Telephone: 403-299-5600 Fax Access: 403-299-5606

то:	Doug Brown, P.Eng, Sunshine Oilsands Inc.	DATE:	April 10, 2008
FROM:	K. Dean Mitchell, P.Geol.	JOB NO:	08-1348-0002
RE:	GROUNDWATER MONITORING V TESTING – GRAND RAPIDS FORM WEST ELLS PROJECT	VELL INSTA IATION	ALLATION AND

1.0 INTRODUCTION

Golder Associates Ltd. (Golder) was retained by Sunshine Oilsands Inc. (Sunshine) to drill, install, develop, and test three groundwater monitoring wells in the Grand Rapids Formation at Sunshine's West Ells project. The purpose of this memorandum is to provide documentation of the work performed, including the borehole logs and results of the slug testing and laboratory analyses of groundwater samples.

2.0 FIELD WORK

Between February 26 and March 6, 2008, three wells were installed within the Grand Rapids Formation by AMA Drilling Ltd. of Red Deer, Alberta using a truck mounted mud rotary drilling rig. Wells were installed at well pads 14-31-94-17 W4 (14-31), 11-30-94-17 W4 (11-30) and 7-36-94-18 W4 (7-36). During the drilling, Golder logged the cuttings. Borehole logs presenting descriptions and depths of the subsurface lithology and well installation details are provided in Attachemnt A. The wells were constructed with 0.05 m (2-inch) diameter schedule 40 PVC with 9.1 m (30 feet) of 0.02-inch slotted screen and 10-20 sand pack. Following installation, the wells were developed by pumping water by the air lift method until the water was clear of fines. A protective steel casing was installed at the surface at each well to protect the PVC well.

On March 19, 20 and 21, 2008, Golder performed falling head slug tests on the three wells using a solid PVC slug and a transducer with datalogger. Following the slug testing, the wells were purged and groundwater samples were collected. For quality assurance/quality control purposes,





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a trip blank and field blank were included for analyses of organic parameters. The groundwater samples were delivered to ALS Laboratory Group in Fort McMurray to be analyzed for the following parameters:

- Dissolved organic and inorganic carbon
- Benzene, toluene, ethylbenzene and xylenes, F1, F2
- Napthenic acids
- Phenols
- Routine anions and cations
- Sulfide
- Dissolved metals

3.0 TESTING RESULTS

The results of the slug test data analyses are presented in Attachment B. The following hydraulic conductivities (K) were estimated:

- 11-30: 0.36 m/day
- 14-31: 0.082 m/day
- 7-36: 0.0046 m/day

Static depths to water measured from the top of the PVC well on March 19, 2008 were 12.640 m at 11-30, 35.325 m at 14-31, and 8.325 m at 7-36.

The laboratory analytical reports are presented in Attachment C.

4.0 LIMITATIONS

This report has been prepared for the exclusive use of Sunshine Oilsands Limited. Golder Associates Ltd. or its employees will not be responsible for any use of the information contained in this document or any reliance on or decision made based on it by an unauthorised third party.

The document is based on data and information collected during an investigation by Golder Associates Ltd., and solely on conditions on the properties investigated at the time of the investigation. No warranty is expressed or implied. This document does not provide a legal opinion regarding compliance with applicable laws and regulatory statutes. No assurance is made regarding changes in environmental conditions subsequent to the time of the investigation.

5.0 CLOSURE

We trust this memorandum meets your needs and expectations. If you have any questions or require additional information, please contact Dean Mitchell at 403-532-5704.

GOLDER ASSOCIATES LTD.

Prepared by:

K. Dean Mitchell, M.Sc., P.Geol. Senior Hydrogeologist

Reviewed by:

D.R. Brown, M.Sc., P.Geol. Principal and Senior Hydrogeologist

KDM:DB/km

Attachments:	Attachment A – Borehold Logs
	Attachment B – Data Analyses Results
	Attachment C – Laboratory Analytical Reports

ATTACHMENT A

BOREHOLE LOGS

RECORD OF BOREHOLE: MW11-30

	ROJEC	T No.: 08-1348-0002.2000.4000 DN: See Location Plan	RECORD OF BOREHOLE: MW11-30 EXCAVATION DATE: March 2, 2008								SI D.	HEET 1 OF 2 ATUM: Local						
ALE	NOI	SOIL PROFILE	Ŀ	1	SA	MPLE	s	DYNAMIC F RESISTANO	PENETRATIO	DN /0.3m		HYDRA	ULIC CO	ONDUC ⁻	TIVITY,	I	VAL ING	PIEZOMETER
DEPTH SC METRE	EXCAVAT METHO	DESCRIPTION	STRATA PLO	ELEV. DEPTH (m)	NUMBER	ТҮРЕ	BLOWS/0.3n	20 SHEAR STF Cu, kPa 10	40 RENGTH 20	30 8 1 natV. + remV.⊕ 30 4	Q - ● U - ○	10 WA Wp 20	™ 10 ATER C0 I	0 6	0 ^{~*} 10 PERCEI	0 NT WI 0	ADDITION LAB. TEST	
		Ground Surface ORGANIC material (MUSKEG), very loose, brown		0.00														Stickup =0.146 m
5 		CLAYEY SILT, little sand, trace gravel, occasional boulders, compact, grey		5.18	-													
- - - - - - - - - - - - - - - - - - -		SILTY CLAY, trace gravel, occasional boulders, firm, dark grey,		10.06														
- - - - - - - -		SAND, some silt, some gravel, dense, brown		18.29	-													
- 25 - 25 	AMA Ron drilling	CLAYEY SILT, little sand, occasional boulders, dense, dark grey		23.77	-													Bentonite
		Sandy SILT, compact, dark grey		36.58	-													
		Silty SAND, dense, grey		47.24	-													
		SAND (GRAND RAPIDS), well graded, medium grained, trace silt, dense, brown		54.86	-													
60				1			_							- <u> </u>		- <u> </u>		
	EPTH \$: 300	SCALE					(Ø	Golde	r Mes							LOGO	3ed: DS Ieckied5

RECORD OF BOREHOLE: MW11-30

PR LO	OJEC CATIO	T No.: 08-1348-0002.2000.4000 N: See Location Plan	RECORD OF BOREHOLE: MW11-30 EXCAVATION DATE: March 2, 2008										Sł D/	HEET 2 OF 2 ATUM: Local					
DEPTH SCALE METRES	EXCAVATION METHOD	SOIL PROFILE	ATA PLOT	ELEV. DEPTH	SA SA	MPLE	OWS/0.3m %	DYNAMIC P RESISTANC 20 I SHEAR STR Cu, kPa	ENETRATIO E, BLOWS 40 (ENGTH I	ON /0.3m 60 8 ⊥ nat V. + rem V. ⊕	Q - ● U - O	HYDRA 10 Wr	AULIC C(k, cm/s) ⁶ 1(ATER C(ONDUC D ⁵ 1 DNTENT			ADDITIONAL AB. TESTING	PIEZOMETI OR STANDPIF INSTALLATI	ER ŽE ON
- 65 - 70 - 75	AMA AMA E: Rondrilling	SAND (GRAND RAPIDS), well graded, medium grained, trace silt, dense, brown (continued)	sesses a sesses a sesse sesses a sesses a sesses a sur				BLO		20	30 4		WF						Bentonite Granular Filter Slotted Section Bentonite Plug	
- 85 - 90		End of BOREHOLE.		85.34															
- 95																			
- 100																			
- 110																			
- 115 - 120																			
DE 1 :	PTH S 300	CALE	1		<u> </u>			Ż	Golde	r vtes	<u> </u>	<u> </u>			<u> </u>	<u> </u>	LOGO		

RECORD OF BOREHOLE: MW14-31

ΥΤΑ ΕΝΤRΥ: YAW	PR LC	ROJEC	T No.: 08-1348-0002.2000.4000	RECORD OF BOREHOLE: MW14-31 EXCAVATION DATE: February 26, 2008							SI D	HEET 1 OF 2 ATUM: Local				
	ш	7	SOIL PROFILE			SAM	PLES	DYNAN		TION (S/0.3m)	HYDRAULIC	CONDUC	TIVITY,	T (n	PIEZOMETER
	DEPTH SCALE METRES	EXCAVATION METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	LOWS/0.3m	SHEAR Cu, kPa	2 40 2 STRENGTH	60 81 nat V. + rem V. ⊕		10 ⁻⁶ WATER Wp I 20	s 10 ⁵ 1 CONTENT W 40 6	0 ⁻⁴ 10 ⁻³ PERCENT 	ADDITIONAL LAB. TESTING	OR STANDPIPE INSTALLATION
	- 0		Ground Surface ORGANICS (MISKEG), loose, light brown		0.00											Stickup =0.146 m
	- 5		CLAYEY SILT, dense, brown		3.05											-
	- 10 - 15 - 20		SILTY CLAY, little sand, little gravel, firm, grey		6.10											2" SCHD, 40 - PVC -
-OGS.GPJ_GLDR_CAN.GDT_4/4/08	- 25 - 30 - 35 - 40 - 45 - 50	AMA Ron drilling	CLAYEY SILT (MUDSTONE), very dense, grey CLAYEY SILT, very dense, grey		27.43											Bentonite
1348-0002-2000-400	- 60		CONTINUED NEXT PAGE		59.13								+			
TESTPIT 08-	DE 1	EPTH S : 300	SCALE	I	I	<u> </u>		Ì	- Gold Associ	er iates				<u> </u>	LOGO	GED: DS ECKED?

RECORD OF BOREHOLE: MW14-31

PROJ LOCA	ECT	T No.: 08-1348-0002.2000.4000 N: See Location Plan	RECORD OF BOREHOLE: MW14-31 EXCAVATION DATE: February 26, 2008							SHEET 2 OF 2 DATUM: Local									
AVATION	THOD	SOIL PROFILE	, PLOT	ELEV.	3ER VS	MPL	s/0.3m 🕅	DYNAMIC RESISTA 20	PENE NCE, E	ETRATIO BLOWS/ D 6	0N 0.3m 0 {		HYDR/ 10	AULIC C k, cm/s D ⁻⁶ 1	ONDUC			ITIONAL TESTING	PIEZOMETEI OR STANDPIPE INSTALLATIO
EXC/	Ξ	DESCRIPTION	STRATA	DEPTH (m)		ТҮР	BLOWS	Cu, kPa	20) 3	arv. + em V. ⊕ 0	Ŭ-Ō	W [2				WI 30	ADD LAB	
65		SAND (SANDSTONE), coarse grained, very dense, brown, light bit odour (<i>continued</i>) Sandy SILT, dense, grey Loss circulation at 62.5 m		60.96	6														
70		Silty SAND, compact to dense, brown		70.10	0														Postosito
80		SAND, medium grained, little silt, very dense, brown		76.20	0														Demonite
85 WY	Ron drilling	SIL I, little sand, very dense, grey Sandy SILT, dense, grey		82.30	9														
90		Silty SAND, very dense, brown		94.49	Ð														Granular Filter
00																			
05		SAND, medium grained, very dense, brown		103.63	3														Slotted Section
10		End of BOREHOLE.		109.73	3														

RECORD OF BOREHOLE: MW7-36

					ORD OF BOREHOLE: MW7-36 EXCAVATION DATE: February 27, 2008				SHEET 1 OF 2 DATUM: Local					
							-	,						
i 14	SOIL PROFILE			SAM	PLES	DYNAMIC PE RESISTANC	NETRATIO E, BLOWS/0	N .3m	HYDRAULIC (k, cm/s	CONDUCTIVITY,	TLo	PIEZOMETER		
EXCAVATIO METHES METHOD		STRATA PLOT	ELEV. DEPTH (m)	NUMBER	BLOWS/0.3m	20 I SHEAR STR Cu, kPa	40 60 ENGTH na re	0 80 at V. + Q ● m V. ⊕ U - O	10 ⁻⁶ WATER C Wp I	10 ⁵ 10 ⁴ 10 ³ CONTENT PERCENT	ADDITIONAI LAB. TESTIN	STANDPIPE INSTALLATION		
•	Ground Surface CLAYEY SILT, some gravel, loose, light		0.00					3 40	20			Stickup =0.146 m		
5	brown, organic smell SILTY CLAY, trace gravel, occasional boulders, stiff, grey		5.18											
20	SAND, coarse grained, some gravel, loose, light brown SILTY CLAY, trace sand, stiff, greyish black		16.15									2" SCHD, 40 PVC		
25 S0 WW S0 S0 S	CLAYEY SILT (MUDSTONE), occasional sand lense, very dense, dark grey		27.43									Bentonite Grout		
35	SILT, some clay, very dense, grey brown		39.62											
45	Silty SAND, very dense, brown		44.20											
50	SAND, medium grained, little silt, dense, brown		48.77											
60		-4		-+		$\vdash - + - \cdot$	+		+	+ +-				

RECORD OF BOREHOLE: MW7-36

z	SOIL	PROFILE		SAN	IPLES	DYNA RESIS	MIC PEN STANCE,	IETRATIO BLOWS	DN 0.3m	1	HYDRA	ULIC C k, cm/s	ONDUCT	TIVITY,	Ţ	NG	PIEZOMETE OR	ĒR
METRES EXCAVATIO METHOD	DESCRIPTIC	Ž STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE BLOWS/0.3m	SHEA Cu, kF	20 R STREI Pa 10	40 6 L NGTH r 20 3	60 81 LatV. + emV.⊕	0 Q-• U-O	10 W/ Wp 20	0 ⁻⁶ 10 ATER CO 0	0 ⁵ 10 DNTENT OW 0 6	0 ⁻⁴ 1/ PERCEI	D ³ ⊥ L NT WI 60	ADDITION/ LAB. TESTI	STANDPIPI INSTALLATIO	E ON
65 Image: state st	SAND, medium grained, f brown (continued) SILT, little sand, little clay grey Hard lense sandstone Sandy SILT, very dense, g Silty SAND, dense, dark g Silty SAND, very dense, c	ittle silt, dense, ittle silt, dense, at 93.88 m grey grey ark grey	96.62														Bentonite Grout	

ATTACHMENT B

DATA ANALYSES RESULTS







ATTACHMENT C

LABORATORY ANALYTICAL RESULTS

ALS Laboratory Group ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division



	ANALYTICAL REPORT		
ATTN: DEAN MITCH	HEIL	_	
1000 940 6 AVE SW		Reported On:	13-MAR-08 05:05 PM Revision: 1
CALGARY AB T2P	3T1		
Lab Work Order #:	L608061	Date Receive	d: 06-MAR-08
Project P.O. #: Job Reference: Legal Site Desc: CofC Numbers:	0813480002 A070643		
Other Information:			
Comments:			
	Charles To Mone		
	CHARLES LEBLANC General Manager, Edmonton		
F	For any questions about this report please contact your Acc	ount Manager:	
	NHAN H NGUYEN		
THIS REPORT SH ALL SAMPLES WI REQUIRE ADDITIO	ALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHOF LL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTAC DNAL SAMPLE STORAGE TIME.	RITY OF THE LABORAT	ORY.

ALS Canada Ltd. (formerly ETL Chemspec Analytical Ltd.) Part of the ALS Laboratory Group 9936-67 Avenue, Edmonton, AB T6E 0P5 Phone: +1 780 413 5227 Fax: +1 780 437 2311 www.alsglobal.com A Campbell Brothers Limited Company
Sample Details	s/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Ву	Batch
1 608061-1									
Sampled By:	NOT PROVIDED on 06-MAR-08 @ 07:30								
Matrix:	WATER								
Dissolved	d Metals								
Dissolve	ed Trace Metals								
	Silver (Ag)	<0.005		0.005	mg/L		11-MAR-08	MSP	R640206
	Aluminum (Al)	0.48		0.01	mg/L		11-MAR-08	MSP	R640206
	Boron (B)	2.79		0.05	mg/L		11-MAR-08	MSP	R640206
	Barium (Ba)	0.022		0.003	mg/L		11-MAR-08	MSP	R640206
	Beryllium (Be)	<0.001		0.001	mg/L		11-MAR-08	MSP	R640206
	Cadillulli (Cd)	<0.001		0.001	mg/L		11-IVIAR-00	MSP	R040200
	Chromium (Cr)	<0.002		0.002	ma/l		11-MAR-08	MSP	R640200
	Copper (Cu)	0.002		0.001	ma/l		11-MAR-08	MSP	R640206
	Molybdenum (Mo)	< 0.005		0.005	mg/L		11-MAR-08	MSP	R640206
	Nickel (Ni)	< 0.002		0.002	mg/L		11-MAR-08	MSP	R640206
	Lead (Pb)	<0.005		0.005	mg/L		11-MAR-08	MSP	R640206
	Tin (Sn)	<0.05		0.05	mg/L		11-MAR-08	MSP	R640206
	Strontium (Sr)	0.112		0.005	mg/L		11-MAR-08	MSP	R640206
	Titanium (Ti)	0.025		0.001	mg/L		11-MAR-08	MSP	R640206
	Thallium (TI)	<0.05		0.05	mg/L		11-MAR-08	MSP	R640206
	Vanadium (V)	0.002		0.001	mg/L		11-MAR-08	MSP	R640206
	$\angle \text{Inc}(\angle n)$	0.010		0.001	mg/L		11-MAR-08	MSP	R640206
	Iron (Fe)-Dissolved	0.034		0.005	mg/L		12-MAR-08	BOC	R639867
	Manganese (Mn)-Dissolved	0.006		0.001	mg/L		12-MAR-08	BOC	R639867
Routine V	Vater Analysis								
Chloride	e (CI)								
	Chloride (Cl)	85		1	mg/L		07-MAR-08	LIW	R638578
ICP met	als and SO4 for routine water								
	Calcium (Ca)	1.5		0.5	mg/L		07-MAR-08	EOC	R638821
	Potassium (K)	4.2		0.5	mg/L		07-MAR-08	EOC	R638821
	Sodium (Na)	<0.1		0.1	mg/L		07-IVIAR-08	EOC	R638821
	Sulfate (SO4)	325		0.5	ma/L		07-IVIAR-00	EOC	R030021
Ion Bala	nce Calculation	525		0.5	ing/L		07-107-100	LOC	11030021
	Ion Balance	102			%		10-MAR-08		
	TDS (Calculated)	1350			mg/L		10-MAR-08		
	Hardness (as CaCO3)	4			mg/L		10-MAR-08		
	Nitrate+Nitrite-N	<0.1		0.1	mg/L		10-MAR-08	BLI	R639392
	Nitrate-N	<0.1		0.1	mg/L		10-MAR-08	BLI	R639392
	Nitrite-N	<0.05		0.05	mg/L		10-MAR-08	BLI	R639392
pH, Con	ductivity and Total Alkalinity								
	рН	8.7		0.1	pН		07-MAR-08	CLLT	R638388
	Conductivity (EC)	2210		0.2	uS/cm		07-MAR-08	CLLT	R638388
	Bicarbonate (HCO3)	733		5	mg/L		07-MAR-08	CLLT	R638388
	Carbonate (CO3)	47		5	mg/L		07-MAR-08	CLLT	R638388
	Hydroxide (OH)	<5		5	mg/L		07-MAR-08	CLLI	R638388
	Aikaimity, Totai (as CaCOS)	080		5	mg/L		07-IVIAR-00	GLLI	R038388
	* Refer to Referenced Information for Q	ualifiers (if any) and M	lethodolog	y .					

Reference Information

Methods Listed	(if applicable):
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ALS Test Code	Matrix	Test Description	Preparation Method Reference(Based On)	Analytical Method Reference(Based On)
CL-ED	Water	Chloride (Cl)		APHA 4500 CI E-Colorimetry
ETL-ROUTINE-ICP-ED	Water	ICP metals and SO4 for row	outine	APHA 3120 B-ICP-OES
FE-DIS-ED	Water	Iron (Fe)-Dissolved		EPA 200.7
IONBALANCE-ED	Water	Ion Balance Calculation		APHA 1030E
MET1-DIS-ED	Water	Dissolved Trace Metals		EPA 6020
MN-DIS-ED N2N3-ED	Water Water	Manganese (Mn)-Dissolve Nitrate+Nitrite-N	ed	EPA 200.7 APHA 4500 NO3-H - COLORIMETRY
NO2-ED	Water	Nitrite-N		APHA 4500 NO2B-Colorimetry
NO3-ED	Water	Nitrate-N		APHA 4500 NO3H-Colorimetry
PH/EC/ALK-ED	Water	pH, Conductivity and Tota Alkalinity	ıl	APHA 4500-H, 2510, 2320

** Laboratory Methods employed follow in-house procedures, which are generally based on nationally or internationally accepted methodologies.

Chain of Custody numbers:

A070643

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location
ED	ALS LABORATORY GROUP - EDMONTON, ALBERTA, CANADA		

GLOSSARY OF REPORT TERMS

Surr - A surrogate is an organic compound that is similar to the target analyte(s) in chemical composition and behavior but not normally detected in environmental samples. Prior to sample processing, samples are fortified with one or more surrogate compounds. The reported surrogate recovery value provides a measure of method efficiency. The Laboratory control limits are determined under column heading D.L.

mg/kg (units) - unit of concentration based on mass, parts per million.

mg/L (units) - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory. UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION. UNLESS OTHERWISE STATED, SAMPLES ARE NOT CORRECTED FOR CLIENT FIELD BLANKS. Although test results are generated under strict QA/QC protocols, any unsigned test reports, faxes, or emails are considered preliminary.

ALS Laboratory Group has an extensive QA/QC program where all analytical data reported is analyzed using approved referenced procedures followed by checks and reviews by senior managers and quality assurance personnel. However, since the results are obtained from chemical measurements and thus cannot be guaranteed, ALS Laboratory Group assumes no liability for the use or interpretation of the results.





Workorder: L608061

Report Date: 13-MAR-08

Page 1 of 5

Client: GOLDER ASSOCIATES LTD 1000 940 6 AVE SW CALGARY AB T2P 3T1

Contact: DEAN MITCHELL

Test		Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
CL-ED		Water							
Batch Re WG737244-4 Chloride (Cl)	638578 DUP		L607895-1 <1	<1	RPD-NA	mg/L	N/A	6.5	07-MAR-08
WG737244-2 Chloride (Cl)	LCS			102		%		94-109	07-MAR-08
WG737244-3 Chloride (Cl)	LCS			101		%		93-113	07-MAR-08
WG737244-1 Chloride (Cl)	MB			<1		mg/L		1	07-MAR-08
WG737244-5 Chloride (Cl)	MS		L607895-1	103		%		87-117	07-MAR-08
ETL-ROUTINE-ICF	P-ED	Water							
Batch R	638821								
WG737145-3 Calcium (Ca)	CRM		ION-915_WA	TER 96		%		96-116	07-MAR-08
Magnesium (M	g)			98		%		91-113	07-MAR-08
Potassium (K)				97		%		88-126	07-MAR-08
Sodium (Na)				98		%		85-118	07-MAR-08
WG737145-4 Calcium (Ca)	DUP		L608114-1 N/A	15		ma/l	0.0	2	07-MAR-08
Magnesium (M	a)		N/A	<0.1	RPD-NA	ma/L	N/A	- 10	07-MAR-08
Potassium (K)	57		N/A	0.7	J	mg/L	0.0	2	07-MAR-08
Sodium (Na)			N/A	300		mg/L	2.2	10	07-MAR-08
Sulfate (SO4)			5.8	0.8	J	mg/L	0.0	2	07-MAR-08
WG737145-1 Calcium (Ca)	MB			<0.5		mg/L		2.5	07-MAR-08
Magnesium (M	g)			<0.1		mg/L		0.5	07-MAR-08
Potassium (K)				<0.5		mg/L		2.5	07-MAR-08
Sodium (Na)				<1		mg/L		5	07-MAR-08
Sulfate (SO4)				<0.5		mg/L		2.5	07-MAR-08
WG737145-5 Calcium (Ca)	MS		L608114-1	107		%		88-116	07-MAR-08
Magnesium (M	g)			109		%		91-117	07-MAR-08
Potassium (K)				98		%		83-115	07-MAR-08
Sodium (Na)				115		%		81-116	07-MAR-08
Sulfate (SO4)				96		%		82-111	07-MAR-08

		Workorder:	L608061		Report Date: 1	3-MAR-08		Page 2 of 5
Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
FE-DIS-ED	Water							
Batch R639867								
WG738417-2 CRM Iron (Fe)-Dissolved		EU-H-2_OPT	WATER 110		%		63-138	11-MAR-08
WG738417-3 DUP Iron (Fe)-Dissolved		L607702-1 0.024	0.025	J	mg/L	0.001	0.02	11-MAR-08
WG738417-5 DUP Iron (Fe)-Dissolved		L607702-2 0.028	0.029	J	mg/L	0.001	0.02	11-MAR-08
WG738417-4 MS Iron (Fe)-Dissolved		L607702-1	103		%		63-138	11-MAR-08
WG738417-6 MS Iron (Fe)-Dissolved		L607702-2	103		%		63-138	11-MAR-08
WG738417-8 MS Iron (Fe)-Dissolved		L608351-1	100		%		63-138	12-MAR-08
MET1-DIS-ED	Water							
Batch R640206								
WG738620-2 CRM		1643E_WAT	ER					
Aluminum (Al)			99		%		85-125	11-MAR-08
Barium (Ba)			99		%		88-109	11-MAR-08
Beryllium (Be)			92		%		74-116	11-MAR-08
Boron (B)			95		%		80-116	11-MAR-08
Cadmium (Cd)			99		%		93-112	11-MAR-08
Chromium (Cr)			96		%		83-118	11-MAR-08
Cobalt (Co)			100		%		90-110	11-MAR-08
Copper (Cu)			101		%		89-112	11-MAR-08
Lead (Pb)			99		%		89-114	11-MAR-08
Molybdenum (Mo)			97		%		91-112	11-MAR-08
Nickel (Ni)			99		%		88-110	11-MAR-08
Strontium (Sr)			99		%		87-109	11-MAR-08
Thallium (TI)			100		%		79-126	11-MAR-08
Vanadium (V)			99		%		89-112	11-MAR-08
Zinc (Zn)			104		%		84-129	11-MAR-08
WG738620-1 MB Aluminum (Al)			<0.01		mg/L		0.05	11-MAR-08
Barium (Ba)			<0.003		mg/L		0.015	11-MAR-08
Beryllium (Be)			<0.001		mg/L		0.005	11-MAR-08
Boron (B)			<0.05		mg/L		0.25	11-MAR-08

		Workorder:	L608061		Report Date: 1	3-MAR-08		Page 3 of 5
Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET1-DIS-ED	Water							
Batch R640206								
WG738620-1 MB			-0.001		~~~ <i>"</i>		0.005	
Caumium (Cu)			<0.001		mg/L		0.005	11-MAR-08
			<0.005		mg/L		0.025	11-MAR-08
			<0.002		mg/L		0.01	11-MAR-08
Copper (Cu)			<0.001		mg/L		0.005	11-MAR-08
			<0.005		mg/L		0.025	11-MAR-08
Molybaenum (Mo)			< 0.005		mg/L		0.025	11-MAR-08
			<0.002		mg/L		0.01	11-MAR-08
Phosphorus (P)			<0.1		mg/L		0.5	11-MAR-08
Silver (Ag)			<0.005		mg/L		0.025	11-MAR-08
Strontium (Sr)			<0.005		mg/L		0.025	11-MAR-08
Thallium (TI)			<0.05		mg/L		0.25	11-MAR-08
Tin (Sn)			<0.05		mg/L		0.25	11-MAR-08
Titanium (Ti)			<0.001		mg/L		0.005	11-MAR-08
Vanadium (V)			<0.001		mg/L		0.005	11-MAR-08
Zinc (Zn)			0.002		mg/L		0.005	11-MAR-08
MN-DIS-ED	Water							
Batch R639867								
WG738417-2 CRM Manganese (Mn)-Dissolve	he	EU-H-2_OPT	102		0/2		62 120	
	20	1 007700 4	102		70		03-130	TT-WAR-00
Manganese (Mn)-Dissolve	ed	L607702-1 0.081	0.080		mg/L	1.1	26	11-MAR-08
WG738417-5 DUP		1 607702-2			C C			
Manganese (Mn)-Dissolve	ed	0.004	0.005	J	mg/L	0.000	0.004	11-MAR-08
WG738417-4 MS		L607702-1						
Manganese (Mn)-Dissolve	ed		102		%		63-138	11-MAR-08
WG738417-6 MS		L607702-2			0 (
Manganese (Mn)-Dissolve	ed		101		%		63-138	11-MAR-08
WG738417-8 MS Manganese (Mn)-Dissolve	-d	L608351-1	99		%		63 139	
			00		,,,		03-130	
N2N3-ED	Water							
Batch R639392								
Nitrate+Nitrite-N			100		%		87-113	10-MAR-08
WG737957-2 MB								
							0.1	

		Workorder:	L608061	Re	port Date: 1	3-MAR-08		Page 4 of 5
Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
N2N3-ED	Water							
Batch R639392								
WG737957-2 MB Nitrate+Nitrite-N			<0.1		mg/L		0.1	10-MAR-08
NO2-ED	Water							
Batch R639392								
WG737957-3 LCS Nitrite-N			103		%		94-114	10-MAR-08
WG727057-2 MR							04 114	
Nitrite-N			<0.05		mg/L		0.05	10-MAR-08
PH/EC/ALK-ED	Water							
Batch R638388								
WG736929-5 DUP	20)	L607891-1	10					
Alkalinity, Total (as CaCo	()3)	12	12	J	mg/L	0	20	07-MAR-08
Bicarbonate (HCO3)		14	14	J	mg/L	0	20	07-MAR-08
Carbonate (CO3)		<5	<5	RPD-NA	mg/L	N/A	26	07-MAR-08
Conductivity (EC)		100	102		uS/cm	2.2	7.1	07-MAR-08
Hydroxide (OH)		<5	<5	RPD-NA	mg/L	N/A	26	07-MAR-08
рН		7.1	7.1	J	рН	0.0	0.2	07-MAR-08
WG736929-2 LCS Conductivity (EC)			103		%		94-106	07-MAR-08
WG736929-3 LCS рН			7.0		рН		6.9-7.1	07-MAR-08
WG736929-4 LCS Alkalinity, Total (as CaCo	O3)		101		%		90-110	07-MAR-08
WG736929-1 MB								
Alkalinity, Total (as CaCo	03)		<5		mg/L		5	07-MAR-08
Bicarbonate (HCO3)			<5		mg/L		5	07-MAR-08
Carbonate (CO3)			<5		mg/L		5	07-MAR-08
Hydroxide (OH)			<5		mg/L		5	07-MAR-08

Workorder: L608061

Report Date: 13-MAR-08

Legend:

Limit	99% Confidence Interval (Laboratory Control Limits)
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

ALS Laboratory Group ANALYTICAL CHEMISTRY & TESTING SERVICES



CHAIN OF CUSTODY / ANALYTICAL REQUEST FORM

CANADA TOLL FREE 1-800-668-9878

coc# A070643

Page ____ of

Environmental Division (ALS))	<u>www.a</u>	alsenviro.co	om								0		•
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Calgary AB		EMAIL 2:				EMERGENCY SERVICE (<1 DAY / WEEKEND) - CONTACT ALS								
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ALS Laboratory Group ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division



GOLDER ASSOCIAT			
ATTN: DEAN MITCH	HELL		
1000 940 6 AVE SW		Reported On:	Revision: 1
CALGARY AB T2P	3T1		
Lab Work Order #:	L612452	Date Receive	ed: 22-MAR-08
Project P.O. #: Job Reference:	08-1348-0002		
Legal Site Desc: CofC Numbers:	A070210		
Other Information:			
Comments:			
	Charles To Mone		
	CHARLES LEBLANC General Manager, Edmonton		
F	For any questions about this report please contact your Acc	ount Manager:	
	NHAN H NGUYEN	-	
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ALS Canada Ltd. (formerly ETL Chemspec Analytical Ltd.) Part of the ALS Laboratory Group 9936-67 Avenue, Edmonton, AB T6E 0P5 Phone: +1 780 413 5227 Fax: +1 780 437 2311 www.alsglobal.com A Campbell Brothers Limited Company

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Ву	Batch
612452-1 SOS 14-31								
Sampled By: ST/DC on 19-MAR-08 @ 18:00								
Matrix: WATER								
Dissolved Metals								
Dissolved Trace Metals								
Silver (Ag)	<0.005		0.005	mg/L		26-MAR-08	MSP	R645058
Aluminum (Al)	0.98		0.01	mg/L		26-MAR-08	MSP	R645058
Boron (B)	1.18		0.05	mg/L		26-MAR-08	MSP	R645058
Barium (Ba)	0.120		0.003	mg/L		26-MAR-08	MSP	R645058
Beryllium (Be)	<0.001		0.001	mg/L		26-MAR-08	MSP	R645058
Cadmium (Cd)	< 0.001		0.001	mg/L		26-MAR-08	MSP	R645058
Cobalt (Co)	< 0.002		0.002	mg/L		26-MAR-08	MSP	R645058
Corromium (Cr)	< 0.005		0.005	mg/L		26-MAR-08	MSP	R645058
Copper (Cu) Malybdanum (Ma)	0.008		0.001	mg/L		20-IVIAR-U0	MSP	R045058
Nickel (Ni)	<0.005		0.005	mg/L		20-IVIAR-00	MSP	R043030
Lead (Pb)	0.005		0.002	mg/L		26-MAR-08	MSP	R645058
Tin (Sn)	<0.000		0.005	mg/L		26-MAR-08	MSP	R645058
Strontium (Sr)	0.211		0.005	ma/l		26-MAR-08	MSP	R645058
Titanium (Ti)	0.008		0.001	ma/L		26-MAR-08	MSP	R645058
Thallium (TI)	< 0.05		0.05	mg/L		26-MAR-08	MSP	R645058
Vanadium (V)	0.006		0.001	mg/L		26-MAR-08	MSP	R645058
Zinc (Zn)	0.117		0.001	mg/L		26-MAR-08	MSP	R645058
Iron (Fe)-Dissolved	6.88		0.005	mg/L		25-MAR-08	BOC	R644377
Manganese (Mn)-Dissolved	0.175		0.001	mg/L		25-MAR-08	BOC	R644377
				0				
BTEX and F1 (C6-C10)								
Benzene	<0.00050		0.0005	mg/L	24-MAR-08	24-MAR-08	DDU	R644158
Toluene	<0.00050		0.0005	mg/L	24-MAR-08	24-MAR-08	DDU	R644158
EthylBenzene	<0.00050		0.0005	mg/L	24-MAR-08	24-MAR-08	DDU	R644158
Xylenes	<0.00050		0.0005	mg/L	24-MAR-08	24-MAR-08	DDU	R644158
F1(C6-C10)	<0.1		0.1	mg/L	24-MAR-08	24-MAR-08	DDU	R644158
F1-BTEX	<0.1		0.1	mg/L	24-MAR-08	24-MAR-08	DDU	R644158
Carbon, Dissolved Inorganic	164		1	mg/L		24-MAR-08	JIAN	R643767
Dissolved Organic Carbon	11		1	mg/L		26-MAR-08	ZOW	R644910
F2 (>C10-C16)	-0.05		0.05	···· ·· //				D045500
F2 (>C IU-C I0)	<0.05		0.05	mg/L	26-MAR-08	26-MAR-08	JLD	R645539
Lithium (Li) Total	100		05-140	70 ma/l	20-1VIAR-00	20-IVIAR-U0	JLD	R045539
	0.21		0.01	mg/∟		31-IVIAR-00	MOD	R040002
Mercury (Hg)-Total	<0.0002		0.0002	mg/∟		31-IVIAR-00	MSP	R040082
Naphthenic Acids	<1		1	mg/L		26-MAR-08	TOK	R645028
Phenois (4AAP)	0.001		0.001	mg/L		26-MAR-08	BLI/SHC	R645092
Strontium (Sr)-Total	0.356		0.002	mg/L		31-MAR-08	MSP	R646682
Sulphide	0.017		0.002	mg/L		25-MAR-08	BLI	R644403
Uranium (U)-Total	<0.05		0.05	mg/L		31-MAR-08	MSP	R646682
Routine Water: Major Ions, F, Fe & Mn								
Chloride (CI)	99		1	ma/l		22-MAD 00		D6/3597
Elucride (E)	00		1	ing/∟		22-101-11-00		1.043307
Fluoride (F)	0.62		0.05	ma/L		22-MAR-08	WYA	R643631
ICP metals and SO4 for routine water				<u> </u>				
Calcium (Ca)	2.5		0.5	mg/L		22-MAR-08	JWU	R643580
Potassium (K)	5.7		0.5	mg/L		22-MAR-08	JWU	R643580
Magnesium (Mg)	1.7		0.1	mg/L		22-MAR-08	JWU	R643580
Sodium (Na)	428		1	mg/L		22-MAR-08	JWU	R643580

Sample Detail	s/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Ву	Batch
l 612452-1	SOS 14-31								
Sampled By:	ST/DC on 19-MAR-08 @ 18:00								
Matrix:	WATER								
Routine	Water: Maior Ions. F. Fe & Mn								
ICP met	als and SO4 for routine water								
	Sulfate (SO4)	153		0.5	mg/L		22-MAR-08	JWU	R643580
Ion Bala	ance Calculation				•				
	Ion Balance	99.5			%		25-MAR-08		
	TDS (Calculated)	1080			mg/L		25-MAR-08		
	Hardness (as CaCO3)	13			mg/L		25-MAR-08		
	Iron (Fe)-Extractable	7.29		0.05	mg/L		24-MAR-08	JWU	R644082
	Manganese (Mn)-Extractable	0.31		0.01	mg/L		24-MAR-08	JWU	R644082
	Nitrate+Nitrite-N	0.1		0.1	mg/L		22-MAR-08	GUO	R643623
	Nitrate-N	<0.1		0.1	mg/L		22-MAR-08	GUO	R643623
	Nitrite-N	0.10		0.05	mg/L		22-MAR-08	GUO	R643623
pH. Con	ductivity and Total Alkalinity				0				
	pН	8.1		0.1	pН		22-MAR-08	WYA	R643631
	Conductivity (EC)	1750		0.2	uS/cm		22-MAR-08	WYA	R643631
	Bicarbonate (HCO3)	822		5	mg/L		22-MAR-08	WYA	R643631
	Carbonate (CO3)	<5		5	mg/L		22-MAR-08	WYA	R643631
	Hydroxide (OH)	<5		5	mg/L		22-MAR-08	WYA	R643631
	Alkalinity, Total (as CaCO3)	674		5	mg/L		22-MAR-08	WYA	R643631
L612452-2	SOS 7-36								
Sampled By:	ST/DC on 20-MAR-08 @ 10:00								
Matrix:	WATER								
BTEX, F1	(C6-C10) and F2 (>C10-C16)								
BTEX a	nd F1 (C6-C10)								
	Benzene	<0.00050		0.0005	mg/L	24-MAR-08	24-MAR-08	DDU	R644158
	Toluene	<0.00050		0.0005	mg/L	24-MAR-08	24-MAR-08	DDU	R644158
	EthylBenzene	<0.00050		0.0005	mg/L	24-MAR-08	24-MAR-08	DDU	R644158
	Xylenes	<0.00050		0.0005	mg/L	24-MAR-08	24-MAR-08	DDU	R644158
	F1(C6-C10)	<0.1		0.1	mg/L	24-MAR-08	24-MAR-08	DDU	R644158
	F1-BTEX	<0.1		0.1	mg/L	24-MAR-08	24-MAR-08	DDU	R644158
F2 (>C1	0-C16)				···· //				D0 45500
Curren	F2 (>C 10-C 16)	< 0.05		0.05	mg/L	26-MAR-08	26-MAR-08	JLD	R645539
Discolvo		101		00-140	70	20-1VIAR-00	20-IVIAR-00	JLD	R040009
Dissolve	d Metals								
01990140	Silver (Aq)	<0.005		0.005	ma/l		26-MAR-08	MSP	R645058
	Aluminum (Al)	0.11		0.01	ma/L		26-MAR-08	MSP	R645058
	Boron (B)	2.73		0.05	mg/L		26-MAR-08	MSP	R645058
	Barium (Ba)	0.025		0.003	mg/L		26-MAR-08	MSP	R645058
	Beryllium (Be)	<0.001		0.001	mg/L		26-MAR-08	MSP	R645058
	Cadmium (Cd)	<0.001		0.001	mg/L		26-MAR-08	MSP	R645058
	Cobalt (Co)	<0.002		0.002	mg/L		26-MAR-08	MSP	R645058
	Chromium (Cr)	<0.005		0.005	mg/L		26-MAR-08	MSP	R645058
	Copper (Cu)	0.007		0.001	mg/L		26-MAR-08	MSP	R645058
	Molybdenum (Mo)	<0.005		0.005	mg/L		26-MAR-08	MSP	R645058
	Nickel (Ni)	0.003		0.002	mg/L		26-MAR-08	MSP	R645058
	Lead (Pb)	<0.005		0.005	mg/L		26-MAR-08	MSP	R645058
	Tin (Sn)	<0.05		0.05	mg/L		26-MAR-08	MSP	R645058
	Strontium (Sr)	0.133		0.005	mg/L		26-MAR-08	MSP	R645058
	Titanium (Ti)	0.005		0.001	mg/L		26-MAR-08	MSP	R645058
	I hallium (TI)	<0.05		0.05	mg/L		26-MAR-08	MSP	R645058
	Vanadium (V)	0.001		0.001	mg/L		26-MAR-08	MSP	R645058

Sample Details	s/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Ву	Batch
1 612452-2	SOS 7.36								
Sampled By:	SUS 7-50 ST/DC on 20-MAR-08 @ 10:00								ĺ
Matrix:	WATER								
Dissolved	d Metals								ĺ
Dissolve	ed Trace Metals								
	Zinc (Zn)	0.166		0.001	mg/L		26-MAR-08	MSP	R645058
	Iron (Fe)-Dissolved	0.153		0.005	mg/L		25-MAR-08	BOC	R644377
	Manganese (Mn)-Dissolved	0.016		0.001	mg/L		25-MAR-08	BOC	R644377
	Carbon, Dissolved Inorganic	150		1	mg/L		24-MAR-08	JIAN	R643767
	Dissolved Organic Carbon	10		1	mg/L		26-MAR-08	ZOW	R644910
	Lithium (Li)-Total	0.13		0.01	mg/L		31-MAR-08	MSP	R646682
	Mercury (Hg)-Total	<0.0002		0.0002	mg/L		31-MAR-08	MSP	R646682
	Naphthenic Acids	<1		1	mg/L		26-MAR-08	ток	R645028
	Phenols (4AAP)	0.003		0.001	mg/L		26-MAR-08	3LI/SHC	R645092
	Strontium (Sr)-Total	0.178		0.002	mg/L		31-MAR-08	MSP	R646682
	Sulphide	0.011		0.002	mg/L		25-MAR-08	BLI	R644403
	Uranium (U)-Total	<0.05		0.05	mg/L		31-MAR-08	MSP	R646682
Routine V	Vater: Major Ions, F, Fe & Mn				-				
Chloride	e (CI)								
	Chloride (Cl)	82		1	mg/L		22-MAR-08	WYA	R643587
Fluoride	(F)		5.10						
	Fluoride (F)	0.96	DLIS	0.1	mg/L		22-MAR-08	WYA	R643631
ICP met	als and SO4 for routine water	1 5		0.5	ma/l		22 MAD 00	134/11	DC42590
	Potassium (K)	1.5		0.5	mg/L		22-MAR-00	1\\//1	R043580
	Magnesium (Mg)	4.0		0.5	mg/L		22-MAR-08		R643580
	Sodium (Na)	514		1	ma/L		22-MAR-08	JWU	R643580
	Sulfate (SO4)	327		0.5	mg/L		22-MAR-08	JWU	R643580
Ion Bala	nce Calculation				0				
	Ion Balance	103			%		25-MAR-08		
	TDS (Calculated)	1310			mg/L		25-MAR-08		
	Hardness (as CaCO3)	7			mg/L		25-MAR-08		
	Iron (Fe)-Extractable	0.88		0.05	mg/L		22-MAR-08	JWU	R643772
	Manganese (Mn)-Extractable	0.04		0.01	mg/L		22-MAR-08	JWU	R643772
	Nitrate+Nitrite-N	0.1		0.1	mg/L		22-MAR-08	GUO	R643623
	Nitrate-N	<0.1		0.1	mg/L		22-MAR-08	GUO	R643623
	Nitrite-N	0.07		0.05	mg/L		22-MAR-08	GUO	R643623
pH, Con	ductivity and Total Alkalinity								
	pH	8.8		0.1	рН		22-MAR-08	WYA	R643632
	Conductivity (EC)	2060	2110	0.2	uS/cm		22-MAR-08	WYA	R643626
	Carbonate (CO3)	139		10	mg/L		22-IVIAR-00		R043031
	Hydroxide (OH)	19 <5	DLIS	10	mg/L		22-MAR-08		R043031
	Alkalinity, Total (as CaCO3)	637	DLIS	10	ma/l		22-MAR-08	WYA	R643631
1 612452-3	SOS 11-30								
Sampled Rv	ST/DC on 20-MAR-08 @ 13:20								
Matrix:	WATER								
BTEX. F1	(C6-C10) and F2 (>C10-C16)								
BTEX ar	d F1 (C6-C10)								
Benzene		<0.00050		0.0005	mg/L	24-MAR-08	24-MAR-08	DDU	R644158
	Toluene	<0.00050		0.0005	mg/L	24-MAR-08	24-MAR-08	DDU	R644158
	EthylBenzene	<0.00050		0.0005	mg/L	24-MAR-08	24-MAR-08	DDU	R644158
	Xylenes	<0.00050		0.0005	mg/L	24-MAR-08	24-MAR-08	DDU	R644158

Sample Details	s/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	By	Batch
1 612452 3	SOS 11 30								
Sampled By:	SUS 11-30 ST/DC on 20-MAR-08 @ 13:20								
Motrix:	WATED								
BTEX. F1	(C6-C10) and F2 (>C10-C16)								
BTEX an	d F1 (C6-C10)								
	F1(C6-C10)	<0.1		0.1	mg/L	24-MAR-08	24-MAR-08	DDU	R644158
	F1-BTEX	<0.1		0.1	mg/L	24-MAR-08	24-MAR-08	DDU	R644158
F2 (>C10	D-C16)								
	F2 (>C10-C16)	<0.05		0.05	mg/L	26-MAR-08	26-MAR-08	JLD	R645539
Surr:	2-Bromobenzotrifluoride	98		65-146	%	26-MAR-08	26-MAR-08	JLD	R645539
Dissolved	d Metals								
DISSOIVE	Silver (Ag)	<0.005		0.005	ma/l		26-MAR-08	MCD	D645058
	Aluminum (Al)	<0.005 0.39		0.005	ma/l		20-MAR-08	MSP	R645058
	Boron (B)	1 17		0.05	ma/l		26-MAR-08	MSP	R645058
	Barium (Ba)	0.037		0.003	mg/L		26-MAR-08	MSP	R645058
	Beryllium (Be)	< 0.001		0.001	mg/L		26-MAR-08	MSP	R645058
	Cadmium (Cd)	<0.001		0.001	mg/L		26-MAR-08	MSP	R645058
	Cobalt (Co)	<0.002		0.002	mg/L		26-MAR-08	MSP	R645058
	Chromium (Cr)	<0.005		0.005	mg/L		26-MAR-08	MSP	R645058
	Copper (Cu)	0.002		0.001	mg/L		26-MAR-08	MSP	R645058
	Molybdenum (Mo)	<0.005		0.005	mg/L		26-MAR-08	MSP	R645058
	Nickel (Ni)	< 0.002		0.002	mg/L		26-MAR-08	MSP	R645058
		<0.005		0.005	mg/L		26-MAR-08	MSP	R645058
	Strontium (Sr)	<0.05		0.05	ma/l		20-IVIAR-00	MSP	R040000
	Titanium (Ti)	0.002		0.000	ma/l		26-MAR-08	MSP	R645058
	Thallium (TI)	< 0.05		0.05	mg/L		26-MAR-08	MSP	R645058
	Vanadium (V)	0.003		0.001	mg/L		26-MAR-08	MSP	R645058
	Zinc (Zn)	0.020		0.001	mg/L		26-MAR-08	MSP	R645058
	Iron (Fe)-Dissolved	2.59		0.005	mg/L		25-MAR-08	BOC	R644377
	Manganese (Mn)-Dissolved	0.070		0.001	mg/L		25-MAR-08	BOC	R644377
	Carbon, Dissolved Inorganic	114		1	mg/L		24-MAR-08	JIAN	R643767
	Dissolved Organic Carbon	10		1	mg/L		26-MAR-08	ZOW	R644910
	Lithium (Li)- I otal	0.15		0.01	mg/L		31-MAR-08	MSP	R646682
	Mercury (Hg)- I otal	<0.0002		0.0002	mg/L		31-MAR-08	MSP	R646682
		<1		1	mg/L		26-MAR-08	TOK	R645028
	Chreatium (Cr) Total	0.002		0.001	mg/∟		20-IVIAR-08	SLI/SHC	R645092
	Strontium (Sr)-Total	0.281		0.002	mg/L		31-MAR-08	MSP	R646682
		0.044		0.002	mg/∟		25-IVIAR-08	BLI	R644403
Poutino V	Vator: Major long, E. Eo & Mn	<0.05		0.05	mg/∟		31-IVIAR-08	MSP	R646682
Chloride									
omorida	Chloride (Cl)	12		1	mg/L		22-MAR-08	WYA	R643587
Fluoride	• (F)				_				
	Fluoride (F)	0.41		0.05	mg/L		22-MAR-08	WYA	R643631
ICP meta	als and SO4 for routine water	0.5		0	mc/l		22 MAD 00	11.671.1	D642500
	Calcium (Ca)	0.5		0.5	mg/L		22-IVIAR-08	JVVU	K043580
	Magnesium (Mg)	3.Z 0.5		0.5	ma/L		22-1VIAR-00		R643580
	Sodium (Na)	353		1	ma/l		22-MAR-08	JWU	R643580
	Sulfate (SO4)	267		0.5	mg/L		22-MAR-08	JWU	R643580
Ion Bala	nce Calculation	-		-				-	
	Ion Balance	98.2			%		25-MAR-08		

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Ву	Batch
1 612452-3	SOS 11-30								
Sampled By:	ST/DC on 20-MAR-08 @ 13 [.] 20								
Matrix:	WATER								
Routine	Vater: Major Ions, F, Fe & Mn								
Ion Bala	nce Calculation								
	TDS (Calculated)	933			mg/L		25-MAR-08		
	Hardness (as CaCO3)	3			mg/L		25-MAR-08		
	Iron (Fe)-Extractable	4.29	RRV	0.05	mg/L		26-MAR-08	JWU	R645171
	Manganese (Mn)-Extractable	0.25	RRV	0.01	mg/L		26-MAR-08	JWU	R645171
	Nitrate+Nitrite-N	0.1		0.1	mg/L		22-MAR-08	GUO	R643623
	Nitrate-N	<0.1		0.1	mg/L		22-MAR-08	GUO	R643623
	Nitrite-N	0.09		0.05	mg/L		22-MAR-08	GUO	R643623
pH, Con	ductivity and Total Alkalinity								D040004
	pH Conductivity (EC)	8.6		0.1	pH US/om		22-IVIAR-08		R643631
	Bicarbonate (HCO3)	565		5	ma/l		22-MAR-00		R043031
	Carbonate (CO3)	18		5	ma/l		22-MAR-08	WYA	R643631
	Hydroxide (OH)	<5		5	ma/L		22-MAR-08	WYA	R643631
	Alkalinity, Total (as CaCO3)	494		5	mg/L		22-MAR-08	WYA	R643631
1 612452-4	SOS 750TB				-				
Sampled By:	ST/DC on 20-MAR-08 @ 10:00								
Matrix:	WATER								
BTEX, F1	(C6-C10) and F2 (>C10-C16)								
BTEX a	nd F1 (C6-C10)								
	Benzene	<0.00050	RWHS	0.0005	mg/L	24-MAR-08	24-MAR-08	DDU	R644158
	Toluene	<0.00050	RWHS	0.0005	mg/L	24-MAR-08	24-MAR-08	DDU	R644158
	EthylBenzene	<0.00050	RWHS	0.0005	mg/L	24-MAR-08	24-MAR-08	DDU	R644158
	Xylenes	<0.00050	RWHS	0.0005	mg/L	24-MAR-08	24-MAR-08	DDU	R644158
	F1(C6-C10)	<0.1		0.1	mg/L	24-MAR-08	24-MAR-08	DDU	R644158
	F1-BIEX	<0.1		0.1	mg/L	24-MAR-08	24-MAR-08	DDU	R644158
F2 (>C1	U-C16) E2 (>C10-C16)	<0.05		0.05	ma/l	26-MAP-08	26-MAR-08		D645530
Surr:	2-Bromobenzotrifluoride	91		65-146	//////////////////////////////////////	26-MAR-08	26-MAR-08		R645539
		01		00 140	70	20 11/2 11 00	20 10 10 100	0LD	11040000
	Naphthenic Acids	<1		1	mg/L		26-MAR-08	ток	R645028
	Phenols (4AAP)	<0.001		0.001	mg/L		26-MAR-08	3LI/SHC	R645092
1 612452-5	SOS 700FB				-				
Sampled By:	ST/DC on 20-MAR-08 @ 10:00								
Matrix:	WATER								
BTEX, F1	(C6-C10) and F2 (>C10-C16)								
BTEX a	nd F1 (C6-C10)								
	Benzene	<0.00050		0.0005	mg/L	24-MAR-08	24-MAR-08	DDU	R644158
	Toluene	<0.00050		0.0005	mg/L	24-MAR-08	24-MAR-08	DDU	R644158
	EthylBenzene	<0.00050		0.0005	mg/L	24-MAR-08	24-MAR-08	DDU	R644158
	Xylenes	<0.00050		0.0005	mg/L	24-MAR-08	24-MAR-08	DDU	R644158
	F1(C6-C10)	<0.1		0.1	mg/L	24-MAR-08	24-MAR-08	DDU	R644158
Fa (a (<0.1		0.1	rng/L	24-IVIAR-08	∠4-IVIAR-08	000	K044158
F2 (>C1	гој F2 (>C10-C16)	<0.3	DLIS	0.3	ma/l	26-MAR-08	26-MAR-08	ם וו,	R645530
Surr:	2-Bromobenzotrifluoride	119		65-146	%	26-MAR-08	26-MAR-08		R645539
					,0		_0		
	Naphthenic Acids	<1		1	mg/L		26-MAR-08	ток	R645028
	Phenols (4AAP)	<0.001		0.001	mg/L		26-MAR-08	3LI/SHC	R645092
					č				
		1	1	1		1		1	

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Ву	Batch
* Refer to Referenced Information for Q	ualifiers (if any) and M	ethodology	<i>(</i> .					

Qualifier

Reference Information

Qualifiers for Individual Samples Listed:

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	Sample Number	Client ID	Qualifier	Description
	L612452-1	SOS 14-31	ISCR:ST	DOC - Improper Sample Container Received: Subsamples Taken
			SFP	DOC - Sample was Filtered and Preserved at the laboratory
	L612452-3	SOS 11-30	ISCR:ST	DOC - Improper Sample Container Received: Subsamples Taken
			SFP	DOC - Sample was Filtered and Preserved at the laboratory

Sample Parameter Qualifier key listed:

Description

DLIS	Detection Limit Adjusted: Insufficient Sample
RRV	Reported Result Verified By Repeat Analysis
RWHS	Samples Received With Headspace

Methods Listed (if app	olicable):			
ALS Test Code	Matrix	Test Description F	Preparation Method Reference(Based On)	Analytical Method Reference(Based On)
BTX,F1-ED	Water	BTEX and F1 (C6-C10)	EPA 5030	EPA 5030/8015&8260-P&T GC-MS & FID
C-DIS-INORG-ED	Water	Carbon, Dissolved Inorganic		APHA 5310 B-Instrumental
C-DIS-ORG-ED	Water	Dissolved Organic Carbon		APHA 5310 B-Instrumental
CL-ED	Water	Chloride (Cl)		APHA 4500 CI E-Colorimetry
ETL-ROUTINE-ICP-ED	Water	ICP metals and SO4 for rout water	line	APHA 3120 B-ICP-OES
F-ED	Water	Fluoride (F)		APHA 4500 F-C-Electrode
F2-ED	Water	F2 (>C10-C16)		EPA 3510/8000-GC-FID
FE-DIS-ED	Water	Iron (Fe)-Dissolved		EPA 200.7
FE-EXT-ROU-ED	Water	Iron (Fe)-Extractable		APHA 3120 B-ICP-OES
HG-TOT-HYD-ED	Water	Mercury (Hg)-Total (CVAA)	EPA3015	EPA 6020
IONBALANCE-ED	Water	Ion Balance Calculation		APHA 1030E
LI-TOT-ED	Water	Lithium (Li)-Total	EPA3015	EPA 6020
MET1-DIS-ED	Water	Dissolved Trace Metals		EPA 6020
MN-DIS-ED	Water	Manganese (Mn)-Dissolved		EPA 200.7
MN-EXT-ROU-ED	Water	Manganese (Mn)-Extractable	e	APHA 3120 B-ICP-OES
N2N3-ED	Water	Nitrate+Nitrite-N		APHA 4500 NO3-H - COLORIMETRY
NAPHTHENIC-ACID-FM	Water	Naphthenic Acids by FTIR		Naphthenic Acids by FTIR,Syncrude,1994
NO2-ED	Water	Nitrite-N		APHA 4500 NO2B-Colorimetry
NO3-ED	Water	Nitrate-N		APHA 4500 NO3H-Colorimetry
PH/EC/ALK-ED	Water	pH, Conductivity and Total Alkalinity		APHA 4500-H, 2510, 2320
PHENOLS-4AAP-ED	Water	Phenols (4AAP)		AB ENV.06537-COLORIMETRIC
				7-32

SR-TOT-ED Water

Strontium (Sr)-Total

EPA3015

EPA 6020

Reference Information

 SULPHIDE-ED
 Water
 Sulphide
 APHA 4500 -S E-Auto-Colorimetry

 U-TOT-ED
 Water
 Uranium (U)-Total
 EPA3015
 EPA 6020

 ** Laboratory Methods employed follow in-house procedures, which are generally based on nationally or internationally accepted methodologies.

 Chain of Custody numbers:

A070210

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location
ED	ALS LABORATORY GROUP - EDMONTON, ALBERTA, CANADA	FM	ALS LABORATORY GROUP - FORT MCMURRAY, ALBERTA, CANADA

GLOSSARY OF REPORT TERMS

Surr - A surrogate is an organic compound that is similar to the target analyte(s) in chemical composition and behavior but not normally detected in environmental samples. Prior to sample processing, samples are fortified with one or more surrogate compounds. The reported surrogate recovery value provides a measure of method efficiency. The Laboratory control limits are determined under column heading D.L.

mg/kg (units) - unit of concentration based on mass, parts per million.

mg/L (units) - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory. UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION. UNLESS OTHERWISE STATED, SAMPLES ARE NOT CORRECTED FOR CLIENT FIELD BLANKS. Although test results are generated under strict QA/QC protocols, any unsigned test reports, faxes, or emails are considered preliminary.

ALS Laboratory Group has an extensive QA/QC program where all analytical data reported is analyzed using approved referenced procedures followed by checks and reviews by senior managers and quality assurance personnel. However, since the results are obtained from chemical measurements and thus cannot be guaranteed, ALS Laboratory Group assumes no liability for the use or interpretation of the results.

Environmental Division



ALS Laboratory Group Quality Control Report

Workorder: L612452

Report Date: 01-APR-08

Page 1 of 14

Client: GOLDER ASSOCIATES LTD 1000 940 6 AVE SW CALGARY AB T2P 3T1

Contact: DEAN MITCHELL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BTX,F1-ED	Water							
Batch R6	644158							
WG743582-3 Benzene	DUP	L612174-8 <0.00050	<0.00050	RPD-NA	mg/L	N/A	20	24-MAR-08
EthylBenzene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	24	24-MAR-08
Toluene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	32	24-MAR-08
F1(C6-C10)		<0.1	<0.1	RPD-NA	mg/L	N/A	17	24-MAR-08
Xylenes		<0.00050	<0.00050	RPD-NA	mg/L	N/A	26	24-MAR-08
WG744099-2 Benzene	LCS		70		%		37-114	24-MAR-08
EthylBenzene			69		%		38-109	24-MAR-08
Toluene			70		%		38-115	24-MAR-08
F1(C6-C10)			96		%		21-187	24-MAR-08
Xylenes			68		%		35-112	24-MAR-08
WG744099-1 Benzene	МВ		<0.00050		mg/L		0.0005	24-MAR-08
EthylBenzene			<0.00050		mg/L		0.0005	24-MAR-08
Toluene			<0.00050		mg/L		0.0005	24-MAR-08
F1(C6-C10)			<0.1		mg/L		0.1	24-MAR-08
Xylenes			<0.00050		mg/L		0.0005	24-MAR-08
WG743582-1 Benzene	MS	L612342-2	93		%		26-114	24-MAR-08
EthvlBenzene			61		%		28-107	24-MAR-08
Toluene			77		%		29-113	24-MAR-08
Xylenes			64		%		28-105	24-MAR-08
WG743582-2 F1(C6-C10)	MS	L612342-2	65		%		33-158	24-MAR-08
	Water							
Batch Rf	43767							
WG743577-3 Carbon,Dissolv	DUP ed Inorganic	L612452-1 164	166		mg/L	0.69	6.5	24-MAR-08
WG743577-2 Carbon,Dissolv	LCS ed Inorganic		103		%		91-112	24-MAR-08
WG743577-1 Carbon,Dissolv	MB ed Inorganic		<1		mg/L		1	24-MAR-08
WG743577-4 Carbon,Dissolv	MS ed Inorganic	L612452-3	94		%		80-118	24-MAR-08

		Workorder:	L612452	2 Re	port Date:	01-APR-08		Page 2 of 14
Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
C-DIS-ORG-ED	Water							
Batch R64491	D							
WG744823-1 LCS Dissolved Organic Ca	3 arbon		95		%		88-108	26-MAR-08
WG744823-4 LCS Dissolved Organic Ca	3 arbon		121		%		63-138	26-MAR-08
WG744823-2 MB Dissolved Organic Ca	arbon		<1		mg/L		1	26-MAR-08
CL-ED	Water							
Batch R64358	7							
WG743309-4 DUI Chloride (Cl)	D	L612020-2 2	2	J	mg/L	0	4	22-MAR-08
WG743309-6 DUI Chloride (Cl)	5	L612334-3 9	9	J	mg/L	0	4	22-MAR-08
WG743309-8 DUI Chloride (Cl)	2	L612346-1 <1	<1	RPD-NA	mg/L	N/A	6.5	22-MAR-08
WG743309-2 LCS Chloride (Cl)	3		108		%		94-109	22-MAR-08
WG743309-3 LCS Chloride (Cl)	3		103		%		93-113	22-MAR-08
WG743309-1 MB Chloride (Cl)			<1		mg/L		1	22-MAR-08
WG743309-5 MS Chloride (Cl)		L612020-2	109		%		87-117	22-MAR-08
WG743309-7 MS Chloride (Cl)		L612334-3	110		%		87-117	22-MAR-08
WG743309-9 MS Chloride (Cl)		L612346-1	101		%		87-117	22-MAR-08
	Wator							
Botob B64259	Water							
WG743357-3 CRI	vi	ION-915 WA	TFR					
Calcium (Ca)			110		%		96-116	22-MAR-08
Magnesium (Mg)			109		%		91-113	22-MAR-08
Sulfate (SO4)			108		%		87-118	22-MAR-08
WG743357-4 DUI Calcium (Ca)	D	L612093-5 N/A	110		mg/L	0.63	14	22-MAR-08
Magnesium (Mg)		N/A	40.0		mg/L	0.54	10	22-MAR-08
Potassium (K)		N/A	4.5	J	- mg/L	0.1	2	22-MAR-08
Sodium (Na)		N/A	25		mg/L	0.34	10	22-MAR-08

		Workorder:	L612452	2	Report Date: 0	1-APR-08		Page 3 of 14
Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ETL-ROUTINE-ICP-ED) Water							
Batch R6435	580							
WG743357-4 D	UP	L612093-5	22.0		ma/l	0.00	10	
	~~	22.0	22.0		liig/∟	0.88	10	22-MAR-08
WG743357-2 LO Calcium (Ca)	CS		96		%		86-106	22-MAR-08
Magnesium (Mg)			98		%		88-108	22-MAR-08
Potassium (K)			98		%		86-106	22-MAR-08
Sodium (Na)			100		%		86-106	22-MAR-08
WG743357-1 M	B							
Calcium (Ca)			<0.5		mg/L		2.5	22-MAR-08
Magnesium (Mg)			<0.1		mg/L		0.5	22-MAR-08
Potassium (K)			<0.5		mg/L		2.5	22-MAR-08
Sodium (Na)			<1		mg/L		5	22-MAR-08
Sulfate (SO4)			<0.5		mg/L		2.5	22-MAR-08
WG743357-5 M	S	L612093-5						
Calcium (Ca)			101		%		88-116	22-MAR-08
Magnesium (Mg)			100		%		91-117	22-MAR-08
Potassium (K)			94		%		83-115	22-MAR-08
Sodium (Na)			94		%		81-116	22-MAR-08
Sulfate (SO4)			88		%		82-111	22-MAR-08
WG743357-7 M	S	L612346-1	112		0/		00.440	
Magnopium (Mg)			110		76 9/		01 117	22-MAR-08
			113		70		91-117	22-MAR-08
Potassium (K)			108		%		83-115	22-MAR-08
			111		%		81-116	22-MAR-08
Sulfate (SO4)			91		%		82-111	22-MAR-08
F-ED	Water							
Batch R6436	531							
WG743345-5 D Fluoride (F)	UP	L612452-3 0.41	0.40	J	mg/L	0.01	0.2	22-MAR-08
WG743345-4 Lo Fluoride (F)	CS		110		%		89-114	22-MAR-08
WG743345-1 M Fluoride (F)	В		<0.05		mg/L		0.05	22-MAR-08
F2-ED	Water							

		Workorder:	L612452	Re	port Date:	01-APR-08		Page 4 of 14
Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F2-ED	Water							
Batch R645539								
WG745537-2 LCS F2 (>C10-C16)			102		%		38-152	26-MAR-08
WG745537-1 MB F2 (>C10-C16)			<0.05		mg/L		0.05	26-MAR-08
FE-DIS-ED	Water							
Batch R644377								
WG744163-2 CRM Iron (Fe)-Dissolved		EU-H-2_OPT	WATER 97		%		63-138	25-MAR-08
WG744163-3 DUP		L611865-7						
Iron (Fe)-Dissolved		7.40	7.37		mg/L	0.48	26	25-MAR-08
Iron (Fe)-Dissolved			<0.005		mg/L		0.005	25-MAR-08
WG744163-4 MS Iron (Fe)-Dissolved		L611865-7	101		%		63-138	25-MAR-08
FE-EXT-ROU-ED	Water							
Batch R643772								
WG743377-2 LCS Iron (Fe)-Extractable			101		%		91-111	22-MAR-08
WG743377-1 MB Iron (Fe)-Extractable			<0.05		mg/L		0.25	22-MAR-08
Batch R644082								
WG743761-3 DUP Iron (Fe)-Extractable		L611805-1 <0.05	<0.05	RPD-NA	mg/L	N/A	9.8	24-MAR-08
WG743761-2 LCS								
Iron (Fe)-Extractable			100		%		91-111	24-MAR-08
WG743761-1 MB Iron (Fe)-Extractable			<0.05		mg/L		0.25	24-MAR-08
WG743761-4 MS Iron (Fe)-Extractable		L611805-1	102		%		93-112	24-MAR-08
Batch R645171								
WG744824-3 DUP Iron (Fe)-Extractable		L612452-3 4.29	4.35		mg/L	1.5	9.8	26-MAR-08
WG744824-2 LCS Iron (Fe)-Extractable			99		%		91-111	26-MAR-08
WG744824-1 MB Iron (Fe)-Extractable			<0.05		mg/L		0.25	26-MAR-08
WG744824-4 MS		L612452-3			-			

		Workorder:	L612452	R	eport Date: ()1-APR-08		Page 5 of 14
Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
FE-EXT-ROU-ED	Water							
Batch R645171								
WG744824-4 MS		L612452-3	100		0/			
ITON (Fe)-Extractable			103		70		93-112	26-MAR-08
HG-TOT-HYD-ED	Water							
Batch R646682								
WG746875-1 MB			-0.0000		ma/l		0.004	
Mercury (Hg)-Total			<0.0002		mg/L		0.001	31-MAR-08
LI-TOT-ED	Water							
Batch R646682								
WG746875-1 MB			-0.01		ma/l		0.05	
Lithum (Li)-Totai			<0.01		mg/L		0.05	31-MAR-08
MET1-DIS-ED	Water							
Batch R645058								
WG744636-2 CRM		1643E_WATI	ER 105		0/_		05 405	
Rarium (Ra)			03		70 0/		85-125	26-MAR-08
Bondlium (Bo)			92		70 0/		38-109	26-MAR-08
Beron (B)			95		70 0/		74-110	26-MAR-08
			101		70 0/2		02 112	20-IVIAR-00
Chromium (Cr)			101		70 %		93-112	26-MAR-08
Cobalt (Co)			100		%		00 110	20-IMAR-00
Copper (Cu)			100		%		90-110	20-IMAR-00
Lead (Ph)			100		%		80 114	20-MAR-00
Molybdenum (Mo)			102		%		03-114 01_112	26-MAR-08
Nickel (Ni)			99		%		88-110	26-MAR-08
Strontium (Sr)			100		%		87-109	26-MAR-08
Thallium (TI)			103		%		79-126	26-MAR-08
Vanadium (V)			99		%		89-112	26-MAR-08
Zinc (Zn)			102		%		84-129	26-MAR-08
WG744636-3 DUP		L612334-5					0. 120	20
Aluminum (Al)		<0.01	<0.01	RPD-NA	mg/L	N/A	14	26-MAR-08
Barium (Ba)		0.149	0.147		mg/L	1.6	9.8	26-MAR-08
Beryllium (Be)		<0.001	<0.001	RPD-NA	mg/L	N/A	10	26-MAR-08

		Workorder:	L612452	L612452 Report Date: 01-APR-08 Page 6 of						
Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed		
MET1-DIS-ED	Water									
Batch R645058										
WG744636-3 DUP Boron (B)		L612334-5 0.45	0.45	J	mg/L	0.01	0.2	26-MAR-08		
Cadmium (Cd)		<0.001	<0.001	RPD-NA	mg/L	N/A	12	26-MAR-08		
Chromium (Cr)		<0.005	<0.005	RPD-NA	mg/L	N/A	16	26-MAR-08		
Cobalt (Co)		<0.002	<0.002	RPD-NA	mg/L	N/A	6.7	26-MAR-08		
Copper (Cu)		0.002	0.002	J	mg/L	0.000	0.004	26-MAR-08		
Lead (Pb)		<0.005	<0.005	RPD-NA	mg/L	N/A	10	26-MAR-08		
Molybdenum (Mo)		<0.005	<0.005	RPD-NA	mg/L	N/A	9.7	26-MAR-08		
Nickel (Ni)		0.016	0.016	J	mg/L	0.000	0.008	26-MAR-08		
Phosphorus (P)		<0.1	<0.1	RPD-NA	mg/L	N/A	10	26-MAR-08		
Silver (Ag)		<0.005	<0.005	RPD-NA	mg/L	N/A	26	26-MAR-08		
Strontium (Sr)		1.33	1.33		mg/L	0.074	6.5	26-MAR-08		
Thallium (TI)		<0.05	<0.05	RPD-NA	mg/L	N/A	11	26-MAR-08		
Tin (Sn)		<0.05	<0.05	RPD-NA	mg/L	N/A	10	26-MAR-08		
Titanium (Ti)		0.002	0.001	J	mg/L	0.000	0.004	26-MAR-08		
Vanadium (V)		<0.001	<0.001	RPD-NA	mg/L	N/A	23	26-MAR-08		
Zinc (Zn)		0.009	0.011	J	mg/L	0.002	0.004	26-MAR-08		
WG744636-5 DUP		L612452-2								
Aluminum (Al)		0.11	0.10		mg/L	5.4	14	26-MAR-08		
Barium (Ba)		0.025	0.025	J	mg/L	0.000	0.012	26-MAR-08		
Beryllium (Be)		<0.001	<0.001	RPD-NA	mg/L	N/A	10	26-MAR-08		
Boron (B)		2.73	2.76		mg/L	1.2	10	26-MAR-08		
Cadmium (Cd)		<0.001	<0.001	RPD-NA	mg/L	N/A	12	26-MAR-08		
Chromium (Cr)		<0.005	<0.005	RPD-NA	mg/L	N/A	16	26-MAR-08		
Cobalt (Co)		<0.002	<0.002	RPD-NA	mg/L	N/A	6.7	26-MAR-08		
Copper (Cu)		0.007	0.007	J	mg/L	0.000	0.004	26-MAR-08		
Lead (Pb)		<0.005	<0.005	RPD-NA	mg/L	N/A	10	26-MAR-08		
Molybdenum (Mo)		<0.005	<0.005	RPD-NA	mg/L	N/A	9.7	26-MAR-08		
Nickel (Ni)		0.003	0.003	J	mg/L	0.000	0.008	26-MAR-08		
Phosphorus (P)		1.4	1.3		mg/L	2.8	10	26-MAR-08		
Silver (Ag)		<0.005	<0.005	RPD-NA	mg/L	N/A	26	26-MAR-08		
Strontium (Sr)		0.133	0.128		mg/L	3.8	6.5	26-MAR-08		
Thallium (TI)		<0.05	<0.05	RPD-NA	mg/L	N/A	11	26-MAR-08		
Tin (Sn)		<0.05	<0.05	RPD-NA	mg/L	N/A	10	26-MAR-08		

		Workorder:	L612452	2	Report Date: 0	1-APR-08		Page 7 of 14
Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET1-DIS-ED	Water							
Batch R64505	В							
WG744636-5 DUI	כ	L612452-2	0.005					
		0.005	0.005	J	mg/∟	0.000	0.004	26-MAR-08
Vanadium(V)		0.001	0.001	J	mg/L	0.000	0.004	26-MAR-08
		0.166	0.156		mg/L	5.7	14	26-MAR-08
WG744636-1 MB Aluminum (Al)			<0.01		mg/L		0.05	26-MAR-08
Barium (Ba)			<0.003		mg/L		0.015	26-MAR-08
Beryllium (Be)			<0.001		mg/L		0.005	26-MAR-08
Boron (B)			<0.05		mg/L		0.25	26-MAR-08
Cadmium (Cd)			<0.001		mg/L		0.005	26-MAR-08
Chromium (Cr)			<0.005		mg/L		0.025	26-MAR-08
Cobalt (Co)			<0.002		mg/L		0.01	26-MAR-08
Copper (Cu)			<0.001		mg/L		0.005	26-MAR-08
Lead (Pb)			<0.005		mg/L		0.025	26-MAR-08
Molybdenum (Mo)			<0.005		mg/L		0.025	26-MAR-08
Nickel (Ni)			<0.002		mg/L		0.01	26-MAR-08
Phosphorus (P)			<0.1		mg/L		0.5	26-MAR-08
Silver (Ag)			<0.005		mg/L		0.025	26-MAR-08
Strontium (Sr)			<0.005		mg/L		0.025	26-MAR-08
Thallium (TI)			<0.05		mg/L		0.25	26-MAR-08
Tin (Sn)			<0.05		mg/L		0.25	26-MAR-08
Titanium (Ti)			<0.001		mg/L		0.005	26-MAR-08
Vanadium (V)			<0.001		mg/L		0.005	26-MAR-08
Zinc (Zn)			0.004		mg/L		0.005	26-MAR-08
WG744636-4 MS		L612334-5						
Aluminum (Al)			105		%		79-120	26-MAR-08
Barium (Ba)			103		%		78-116	26-MAR-08
Beryllium (Be)			109		%		76-125	26-MAR-08
Boron (B)			99		%		75-121	26-MAR-08
Cadmium (Cd)			104		%		86-112	26-MAR-08
Chromium (Cr)			96		%		80-113	26-MAR-08
Cobalt (Co)			99		%		86-113	26-MAR-08
Copper (Cu)			98		%		88-108	26-MAR-08
Lead (Pb)			103		%		86-116	26-MAR-08

		Workorder	L612452	2	Report Date: 0)1-APR-08		Page 8 of 14
Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET1-DIS-ED	Water							
Batch R645058	i i							
WG744636-4 MS		L612334-5	100		0/			
Molybdenum (Mo)			106		%		81-116	26-MAR-08
			99		%		86-110	26-MAR-08
Phosphorus (P)			104		%		81-119	26-MAR-08
Silver (Ag)			83	_	%		22-143	26-MAR-08
Strontium (Sr)			124	E	%		73-121	26-MAR-08
Thallium (TI)			105		%		84-118	26-MAR-08
Tin (Sn)			110		%		91-118	26-MAR-08
Titanium (Ti)			102		%		85-118	26-MAR-08
Vanadium (V)			99		%		86-115	26-MAR-08
Zinc (Zn)			91		%		74-125	26-MAR-08
WG744636-6 MS Aluminum (Al)		L612452-2	108		%		79-120	26-MAR-08
Barium (Ba)			108		%		78-116	26-MAR-08
Bervllium (Be)			111		%		76-125	26-MAR-08
Boron (B)			145	Е	%		75-121	26-MAR-08
Cadmium (Cd)			105		%		86-112	26-MAR-08
Chromium (Cr)			102		%		80-113	26-MAR-08
Cobalt (Co)			105		%		86-113	26-MAR-08
Copper (Cu)			102		%		88-108	26-MAR-08
Lead (Pb)			104		%		86-116	26-MAR-08
Molybdenum (Mo)			109		%		81-116	26-MAR-08
Nickel (Ni)			104		%		86-110	26-MAR-08
Silver (Ag)			70		%		22-143	26-MAR-08
Strontium (Sr)			109		%		73-121	26-MAR-08
Thallium (TI)			104		%		84-118	26-MAR-08
Tin (Sn)			111		%		91-118	26-MAR-08
Titanium (Ti)			107		%		85-118	26-MAR-08
Vanadium (V)			104		%		86-115	26-MAR-08
Zinc (Zn)			103		%		74-125	26-MAR-08
					<i>,</i> .		17-125	

MN-DIS-ED

Water

	Workorder:	L612452	Re	port Date:	01-APR-08		Page 9 of 14
Test Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MN-DIS-ED Water							
Batch R644377							
WG744163-2 CRM Manganese (Mn)-Dissolved	EU-H-2_OPT	WATER 98		%		63-138	25-MAR-08
WG744163-3 DUP Manganese (Mn)-Dissolved	L611865-7 2.05	2.04		mg/L	0.41	26	25-MAR-08
WG744163-1 MB Manganese (Mn)-Dissolved		<0.001		mg/L		0.001	25-MAR-08
WG744163-4 MS Manganese (Mn)-Dissolved	L611865-7	95		%		63-138	25-MAR-08
MN-EXT-ROU-ED Water							
Batch R643772							
WG743377-2 LCS Manganese (Mn)-Extractable		101		%		92-108	22-MAR-08
WG743377-1 MB Manganese (Mn)-Extractable		<0.01		mg/L		0.05	22-MAR-08
Batch R644082							
WG743761-3 DUP Manganese (Mn)-Extractable	L611805-1 <0.01	<0.01	RPD-NA	mg/L	N/A	10	24-MAR-08
WG743761-2 LCS Manganese (Mn)-Extractable		104		%		92-108	24-MAR-08
WG743761-1 MB Manganese (Mn)-Extractable		<0.01		mg/L		0.05	24-MAR-08
WG743761-4 MS Manganese (Mn)-Extractable	L611805-1	93		%		82-112	24-MAR-08
Batch R645171							
WG744824-3 DUP	L612452-3						
Manganese (Mn)-Extractable	0.25	0.25		mg/L	1.3	10	26-MAR-08
WG744824-2 LCS Manganese (Mn)-Extractable		98		%		92-108	26-MAR-08
WG744824-1 MB Manganese (Mn)-Extractable		<0.01		mg/L		0.05	26-MAR-08
WG744824-4 MS Manganese (Mn)-Extractable	L612452-3	102		%		82-112	26-MAR-08
N2N3-ED Water							
Batch R643623							
WG743318-10 DUP Nitrate+Nitrite-N	L612452-3 0.1	0.1	J	mg/L	0.0	0.4	22-MAR-08
WG743318-4 DUP	L612056-10						

		Workorder:	L612452	Re	port Date: 0 ⁴	I-APR-08		Page 10 of 14
Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
N2N3-ED	Water							
Batch R643623								
WG743318-4 DUP Nitrate+Nitrite-N		L612056-10 <0.1	<0.1	RPD-NA	mg/L	N/A	6.9	22-MAR-08
WG743318-6 DUP Nitrate+Nitrite-N		L612093-1 0.3	0.3	J	mg/L	0.0	0.4	22-MAR-08
WG743318-8 DUP Nitrate+Nitrite-N		L612112-6 <0.1	<0.1	RPD-NA	mg/L	N/A	6.9	22-MAR-08
WG743318-3 LCS Nitrate+Nitrite-N			100		%		87-113	22-MAR-08
WG743318-2 MB Nitrate+Nitrite-N			<0.1		mg/L		0.1	22-MAR-08
WG743318-11 MS Nitrate+Nitrite-N		L612465-5	96		%		84-118	22-MAR-08
WG743318-5 MS Nitrate+Nitrite-N		L612056-10	103		%		84-118	22-MAR-08
WG743318-7 MS Nitrate+Nitrite-N		L612093-1	97		%		84-118	22-MAR-08
WG743318-9 MS Nitrate+Nitrite-N		L612112-6	102		%		84-118	22-MAR-08
NAPHTHENIC-ACID-FM	Water							
Batch R645028								
WG744953-3 DUP Naphthenic Acids		L611872-2 <1	<1	RPD-NA	mg/L	N/A	33	26-MAR-08
WG744953-4 LCS Naphthenic Acids			97		%		55-145	26-MAR-08
WG744953-1 MB Naphthenic Acids			<1		mg/L		1	26-MAR-08
WG744953-2 MS Naphthenic Acids		L611872-1	111		%		55-145	26-MAR-08
NO2-ED	Water							
Batch R643623								
WG743318-10 DUP Nitrite-N		L612452-3 0.09	0.08	J	mg/L	0.00	0.2	22-MAR-08
WG743318-4 DUP Nitrite-N		L612056-10 <0.05	<0.05	RPD-NA	mg/L	N/A	6.5	22-MAR-08
WG743318-6 DUP Nitrite-N		L612093-1 <0.05	<0.05	RPD-NA	mg/L	N/A	6.5	22-MAR-08
WG743318-8 DUP		L612112-6						

		Workorder:	L612452	Re	port Date: C	1-APR-08		Page 11 of 14
Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NO2-ED	Water							
Batch R64	3623							
WG743318-8 Nitrite-N	DUP	L612112-6 <0.05	<0.05	RPD-NA	mg/L	N/A	6.5	22-MAR-08
WG743318-3 Nitrite-N	LCS		104		%		94-114	22-MAR-08
WG743318-2 Nitrite-N	МВ		<0.05		mg/L		0.05	22-MAR-08
WG743318-11 Nitrite-N	MS	L612465-5	108		%		88-113	22-MAR-08
WG743318-5 Nitrite-N	MS	L612056-10	107		%		88-113	22-MAR-08
WG743318-7 Nitrite-N	MS	L612093-1	105		%		88-113	22-MAR-08
WG743318-9 Nitrite-N	MS	L612112-6	104		%		88-113	22-MAR-08
PH/EC/ALK-ED	Water							
Batch R64	3626							
WG743344-5 Alkalinity, Total (a	DUP as CaCO3)	L612346-1 <5	<5	RPD-NA	mg/L	N/A	6.5	22-MAR-08
Bicarbonate (HC	O3)	<5	<5	RPD-NA	mg/L	N/A	26	22-MAR-08
Carbonate (CO3))	<5	<5	RPD-NA	mg/L	N/A	26	22-MAR-08
Conductivity (EC)	0.4	0.4	J	uS/cm	0.1	10	22-MAR-08
Hydroxide (OH)		<5	<5	RPD-NA	mg/L	N/A	26	22-MAR-08
рН		5.5	5.4	J	pН	0.1	0.2	22-MAR-08
WG743344-2 Conductivity (EC	LCS		99		%		94-106	22-MAR-08
WG743344-3 рН	LCS		7.0		рН		6.9-7.1	22-MAR-08
WG743344-4 Alkalinity, Total (a	LCS as CaCO3)		96		%		90-110	22-MAR-08
WG743344-1 Alkalinity, Total (a	MB as CaCO3)		<5		mg/L		5	22-MAR-08
Bicarbonate (HC	O3)		<5		mg/L		5	22-MAR-08
Carbonate (CO3))		<5		mg/L		5	22-MAR-08
Hydroxide (OH)			<5		mg/L		5	22-MAR-08

		Workorder:	L612452	2 Re	port Date: ()1-APR-08		Page 12 of 14
Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PH/EC/ALK-ED	Water							
Batch R6436	31							
WG743345-5 DU Alkalinity, Total (as	JP CaCO3)	L612452-3 494	489		mg/L	0.83	6.5	22-MAR-08
Bicarbonate (HCO3)	565	540		mg/L	4.6	26	22-MAR-08
Carbonate (CO3)		18	28	J	mg/L	10	20	22-MAR-08
Conductivity (EC)		1490	1500		uS/cm	0.21	7.1	22-MAR-08
Hydroxide (OH)		<5	<5	RPD-NA	mg/L	N/A	26	22-MAR-08
pН		8.6	8.6	J	pН	0.0	0.2	22-MAR-08
WG743345-2 LC Conductivity (EC)	s		98		%		94-106	22-MAR-08
WG743345-3 LC рН	s		6.9		рН		6.9-7.1	22-MAR-08
WG743345-4 LC Alkalinity, Total (as	:S CaCO3)		102		%		90-110	22-MAR-08
WG743345-1 MI Alkalinity, Total (as	B CaCO3)		<5		mg/L		5	22-MAR-08
Bicarbonate (HCO3)		<5		mg/L		5	22-MAR-08
Carbonate (CO3)			<5		mg/L		5	22-MAR-08
Hydroxide (OH)			<5		mg/L		5	22-MAR-08
Batch R6436	32							
WG743409-1 LC рН	s		4.0		рН		3.9-4.1	22-MAR-08
WG743409-2 LC рН	s		7.0		рН		6.9-7.1	22-MAR-08
WG743409-3 LC рН	s		10.0		рН		9.9-10.1	22-MAR-08
PHENOLS-4AAP-ED	Water							
Batch R6450	92							
WG744548-3 DU Phenols (4AAP)	JP	L611442-9 0.018	0.017		mg/L	2.9	9.8	26-MAR-08
WG744548-4 DL Phenols (4AAP)	JP	L612050-4 <0.001	<0.001	RPD-NA	mg/L	N/A	9.8	26-MAR-08
WG744548-6 DU Phenols (4AAP)	JP	L612789-1 0.034	0.034		mg/L	0.59	9.8	26-MAR-08
WG744548-7 DL Phenols (4AAP)	JP	L612814-1 <0.001	<0.001	RPD-NA	mg/L	N/A	9.8	26-MAR-08
W0744E49.2 10	` C							

WG744548-2 LCS

		Workorder:	L612452	Re	port Date:	01-APR-08		Page 13 of 14
Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PHENOLS-4AAP-ED	Water							
Batch R645092								
WG744548-2 LCS Phenols (4AAP)			100		%		85-115	26-MAR-08
WG744548-1 MB Phenols (4AAP)			<0.001		mg/L		0.001	26-MAR-08
WG744548-5 MS Phenols (4AAP)		L612050-4	96		%		76-124	26-MAR-08
SR-TOT-ED	Water							
Batch R646682								
WG746875-1 MB Strontium (Sr)-Total			0.002		mg/L		0.01	31-MAR-08
SULPHIDE-ED	Water							
Batch R644403								
WG744012-4 DUP Sulphide		L612814-1 <0.002	<0.002	RPD-NA	mg/L	N/A	16	25-MAR-08
WG744012-2 LCS Sulphide			84		%		63-116	25-MAR-08
WG744012-3 LCS Sulphide			81		%		70-119	25-MAR-08
WG744012-1 MB Sulphide			<0.002		mg/L		0.002	25-MAR-08
WG744012-5 MS		l 612814-1			U		0.002	20
Sulphide		20120111	88		%		42-140	25-MAR-08
U-TOT-ED	Water							
Batch R646682								
WG746875-1 MB Uranium (U)-Total			<0.05		mg/L		0.25	31-MAR-08

Workorder: L612452

Report Date: 01-APR-08

Legend:

Limit	99% Confidence Interval (Laboratory Control Limits)
	Duplicate Balativa Baraant Difference
IN/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
E	Matrix Spike recovery outside ALS DQO due to analyte background in sample.
J	Duplicate results and limits are expressed in terms of absolute difference.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

ALS Laboratory Group

The state



CHAIN OF CUSTODY / ANALYTICAL REQUEST FORM

CANADA TOLL FREE 1-800-668-9878

coc# A070210

Page ____ of ____

Environmental Division (AL	S)	www.a	Isenviro.co	<u>ini</u>										2			
REPORT TO: DEAN MITCHELL		REPORT FORMAT / DISTRIBUTION				SERVICE REQUESTED											
COMPANY: GOLDER ASSOCIATES		STANDARD OTHER				REGULAR SERVICE (DEFAULT)											
CONTACT: 1000, 940 - (0 AVE- 51)		PDFEXCEL				RUSH SERVICE (2-3 DAYS)											
ADDRESS: Calgary, AB	EMAI	EMAIL 1: DEAN _MITCHELL @ BOLDER, COM				PRIORITY SERVICE (1 DAY or ASAP)											
. /.	EMAI	EMAIL 2:				EMERGENCY SERVICE (<1 DAY / WEEKEND) - CONTACT ALS											
PHONE: 403 650 8041 FAX:									ANAL	YSIS R	EQUES	T					
INVOICE TO: SAME AS REPORT ? (YES)NO	INDICA	NDICATE BOTTLES: FILTERED / PRESERVED (F/P) -+ -+ -+					· EPPEPEPEPEPEPE										
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GUIDELINES / REGULATIONS	SPECIAL INSTRUCTIONS / HAZARDOUS DETAILS																
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