



March 2, 2004

Mr. Rory Grewar
Secretary
Clean Environment Commission
305 - 155 Carlton St.
Winnipeg, MB R3C 3H8

Dear Mr. Grewar:

Re: Wuskwatim Enquiry – Witness CV's

We must advise that our witness, Mr. Paul Robillard, who lives and works in Ontario and who worked on our DSM Study, has advised us that he will be unable to attend the Hearing. In his place, Mr. Alex Fleming who also played a major role in the same study will be made available to respond to detailed questions on the study and DSM. Mr. Fleming's CV is attached.

In addition, we can confirm that Mr. Marvin Shaffer, whose report on the subject of Wuskwatim and wind energy was filed as part of our Rebuttal, has advised that he will try to be available to answer questions subject to being able to make travel arrangements and if CEC participants request that he be produced. Mr. Shaffer lives in the Vancouver area. His CV is attached.

Sincerely,

MANITOBA HYDRO

Ed Wojczynski
Division Manager
Power Planning and Development

Attach.

NCN

William E. Thomas
Councillor
Future Development Portfolio



March 2, 2004

Mr. Rory Grewar
Secretary
Clean Environment Commission
305 - 155 Carlton St.
Winnipeg, MB R3C 3H8

Dear Mr. Grewar:

Re: Wuskwatim Enquiry - TREE Rebuttal

Although we continue to await the responses of TREE and Mr. Ralph Torrie to the Information Requests we posed to them, at least one participant has indicated they would like to have some response filed by us in Rebuttal on the subject of DSM before they cross-examine the Proponents. Accordingly, we attach our Rebuttal on the subject of DSM and note that we expect to provide additional Rebuttal to whatever TREE / Mr. Ralph Torrie provides in answer to IRs once we have received and reviewed them.

Sincerely,

MANITOBA HYDRO

A handwritten signature in black ink, appearing to read 'Ed Wojczynski'.

Ed Wojczynski
Division Manager
Power Planning and Development

Attach.

NCN

A handwritten signature in black ink, appearing to read 'William E. Thomas'.

William E. Thomas
Councillor
Future Development Portfolio

ALEX FLEMING, P. ENG.

PRESIDENT



PROFILE

In 1990, Mr. Fleming founded DEMAND SIDE ENERGY in Vancouver. DSE has operated as an energy engineering firm specializing in commercial and industrial energy management. More than 200 projects have been successfully completed under his direction and the firm's unique and successful approach to technology transfer and DSM assessment and program design work is widely recognized.

As an Energy Manager and planner for government and major industry, Mr. Fleming has an ongoing role for design, implementation and operation of electric and gas energy management programs for boilers, motors, adjustable speed drives, pumps and new construction.

Mr. Fleming brings to the project over 18 years experience in commercial and industrial facility energy audits, energy use verification and engineering reviews for energy performance contracts. In addition to the site-based work, his DSM Program design development and delivery is broad, including six Power Smart programs and several major utility DSM marketing and assessment projects.

EXPERTISE

Mr. Fleming's work on DSM Program design, development and delivery is well regarded throughout both Canada and the United States. Some of his recent publications and presentations are regarded as being among the most thoroughly discussed. He has contributed widely to the development of Canadian and international utility efficiency programs.

In fact, he developed and delivered (1990- 1996) the Power Smart High Efficiency Motors Program, which continues to be recognized as the most impact-full industrial demand side management initiatives in North America and sited case study in Market transformation in the DSM industry world-wide.

Specific to the gas utility industry, Mr. Fleming led the BC Gas DSM team to an analysis of the commercial DSM potential in 1995.

Commercial/Industrial Energy Auditing:

With over 250 energy audits completed and extensive commercial sector audit and training experience in Jamaica, Slovakia, Malaysia, Brazil and India, Mr. Fleming and his team of professionals are an asset to any project that emphasizes end-use rationalization and energy impact realization. This energy audit experience has afforded DSE a first-hand insight into the range of practical energy management alternatives applicable to institutional, commercial and industrial facilities; moreover, it has enabled them to tailor a wide range of technology and energy management training services to industry needs

Energy Performance Reviews: DSE's primary role is to provide objective technical evaluations and monitoring to validate energy savings for both the commercial and industrial sectors. As a Bridging Consultant, Owners representative or an Engineering Project reviewer, Mr. Fleming bring a wealth of knowledge from the commercial facility efficiency and cost reduction opportunities to DSM Program designers and evaluators.

PROFESSIONAL HISTORY

1990 –Present: President, Demand Side Energy

1988-1990: Consulting Mechanical Engineer/Design Engineer, E.J Faraci and Associates Ltd.

1986-1988: Engineering officer, Manitoba Department of Energy & Mines

1986: Bachelor of Science in Engineering.

RELEVANT DSM PROJECT EXPERIENCE – Alex Fleming, P.Eng.

Jamaica Public Service Company- Industrial Sector DSM Potential 1994: Demand Side Energy was retained to provide technology assessments for electricity demand and energy reduction for Jamaica's industrial sector. This study was substantially based on 20 industrial site energy assessments, which included load measurement, profiling and equipment inventory and energy indexing. This project was completed with Marbek Resource Consultants

Ontario Hydro High Efficiency Motors Program Evaluation and Summary 1995:

Conducted customer and trade ally interviews, assessed technology baseline and estimated program impact for this \$22,000,000 DSM initiative during it's wind down phase. Compiled all rebate database information and assessed the program impact through in-situ efficiency testing and laboratory testing of high efficiency motors.

DSM Program Options for BC Gas - 1995

This study provided an investigation into possible DSM programs for BC Gas that would meet the utility goals and address the key segments, namely multi family, institutional, Primary industry and Office. This study included a market assessment; technical measure modelling as well as preliminary program recommendations and benefit cost modelling.

BC Gas Commercial DSM Program Consulting: 1995 - 1999

During this period Mr. Fleming met the Boiler Tune Up Pilot and Boiler Efficiency and testing Analysis program consulting needs- including on-site assessment and coordination with BC Gas technicians and equipment. Project reporting and on-going evaluation of the results was carried out until 1998. In addition the development and evaluation of HVAC demonstration Pilot Projects was conducted.

Jamaica Public Service Commercial Sector Energy Management Program :1998

Demand Side Energy was retained by Jamaica Public Service to conduct energy assessment for their Top 20 commercial customers or customer groups. On site assessments were conducted to estimate the energy savings potential for high efficiency lighting systems, cooling systems and building control systems.

Manitoba Hydro Conservation Potential Assessment, 1999:

Provided an assessment of technical and market potential for DSM for the commercial and residential sectors in Manitoba. Provide the utility with end use breakdowns by more than 15 commercial

Tanaga (TNB-Malaysia) Commercial Sector Conservation Potential Review 2000

Provided a technical assessment of DSM potential for Malaysia's commercial sector. This study was substantially based on 20 commercial site energy assessments, which included load measurement, profiling and equipment inventory and energy indexing. This project was completed with Marbek Resource Consultants technical and market

BC Hydro Conservation Potential Review – Industrial Sector 2002.

Provided an assessment of the conservation potential of the light industrial and manufacturing sectors in British Columbia for the Conservation Potential review update. This project was completed with Marbek resources.

PROFESSIONAL ASSOCIATIONS

- Association of Professional Engineers, BC
- Association of Professional Engineers, MB
- American Society of Heating Refrigerating Air Conditioning Engineers

MSA

Marvin Shaffer & Associates Ltd.
Consulting Economists

14358 Marine Drive
White Rock, B.C. V4B 1C1
Telephone: (604) 531-6211
Fax: (604) 531-6213

MARVIN SHAFFER & ASSOCIATES LTD.

Marvin Shaffer & Associates Ltd. (MSA) is a British Columbia-based consulting firm which specializes in energy, transportation and natural resource economics, as well as general project and economic policy analysis. In all undertakings, the primary objective is to apply sound economic principles and theory to practical problems in a rigorous yet readily comprehensible manner.

Dr. Marvin Shaffer, the principal consultant, has a Ph.D. in Economics from the University of British Columbia. He received his B.A., Honours in Economics, from McGill University. Dr. Shaffer has managed MSA for over twenty-five years, undertaking consulting assignments for both public and private sector clients across Canada. He has successfully negotiated major agreements in the energy and transportation fields. He has held senior positions with the Government of British Columbia (head of the Crown Corporations Secretariat and Chief Executive Officer of the British Columbia Transportation Financing Authority). As well, he has lectured in economics at the University of British Columbia, and the University of Queensland and the University of Tasmania in Australia.

Dr. Shaffer's resume and a list of representative clients are attached.

MARVIN SHAFFER, Ph.D.

RÉSUMÉ

DATE OF BIRTH: May 1, 1949

PLACE OF BIRTH: Winnipeg, Manitoba

CITIZENSHIP: Canadian

EDUCATION: McGill University, Montreal, Quebec
B.A. (Honours) Economics, 1970.

University of British Columbia, Vancouver, B.C.
Ph.D. Economics, 1974.
Ph.D. Dissertation Topic: The Role of Competition in Macro Models
Areas of Specialization: Industrial Organization - Labour Economics

AWARDS: Woodrow Wilson Fellowship, 1970
U.B.C. Fellowships, 1970-1972
Canada Council Fellowships, 1972-1974

MAJOR ACCOMPLISHMENTS:

- ***Greater Vancouver Transportation Authority:***
 - Negotiated agreement and co-chaired transition team transferring responsibility for BC Transit from the Province to Greater Vancouver within a newly created multi-modal, integrated transportation authority.
- ***Columbia River Treaty:***
 - Negotiated agreements for the return of the power benefits owed to British Columbia under the *Columbia River Treaty* in a manner which minimizes transmission costs and maximizes market opportunities for the province.
- ***Multiple Account Evaluation Guidelines:***
 - Developed framework now widely used within British Columbia for the evaluation of major policies and projects, recognizing financial, customer service, environmental and economic development objectives of government.

EMPLOYMENT:

- 1976-1992, 1995-Present *Consulting Economist* - President and senior consultant for Marvin Shaffer & Associates Ltd., a consulting firm specializing in energy, transportation and environmental economics.
- 1987, 1989, 1997-Present *Sessional Lecturer in Economics, University of British Columbia* - macroeconomics and benefit-cost analysis.
- June 1994-June 1995 *Chief Executive Officer, British Columbia Transportation Authority*, a Crown corporation responsible for integrated transportation planning and the financing of provincial highway and other transportation infrastructure investments.
- Aug. 1993-June 1995 *Secretary Responsible for the British Columbia Crown Corporations Secretariat*, a central agency responsible for reviewing strategic and business plans, and monitoring the performance of British Columbia's Crown corporations.
- June 1992-Aug. 1993 *Assistant Secretary, Capital Evaluation and Economic Analysis, British Columbia Crown Corporations Secretariat* -- Developed Multiple Account Guidelines for British Columbia's Crown corporations to ensure systematic evaluation of major investments; served as British Columbia's Chief Negotiator for the return of the Downstream Benefits owed to British Columbia under the Columbia River Treaty.
- 1985, 1988, 1992, 2000,2003 *Visiting Senior Lecturer in Economics, University of Tasmania and University of Queensland* -Lectured in benefit-cost analysis, natural resource economics, macroeconomics, and other subjects.
- 1976-present *Freelance Writer* - Freelance writer on economics and energy issues for major newspapers in Western Canada
- 1974-1976 *Senior Economist, B.C. Energy Commission* - Researched and prepared reports on a wide range of energy topics, including future energy demand, utility rate structure, energy supply, field pricing and resource taxation.

MARVIN SHAFFER & ASSOCIATES LTD.

REPRESENTATIVE CLIENTS

Governments

Federal

Auditor General
Department of Indian Affairs
Employment and Immigration Canada
Energy, Mines & Resources Canada
External Affairs
Fisheries & Oceans Canada
Health & Welfare Canada
Public Works Canada
Science Council of Canada
Transport Canada

Provincial

Province of British Columbia
Crown Corporations Secretariat
Environment & Land Use Secretariat
Marine Resources Branch
Ministry of Agriculture
Ministry of Economic Development
Ministry of Employment and Investment
Ministry of Energy, Mines & Petroleum
Resources
Ministry of Environment
Ministry of Forests
Ministry of Lands, Parks & Housing
Ministry of Social Services & Housing
Government of the Northwest Territories
Manitoba Energy Authority
Yukon Territorial Government

Other

City of Surrey
Greater Vancouver Regional District
GVTA (Translink)

Public Task Forces and Inquiries

B.C.-Environment Assessment Office
Salmon Aquaculture Review
B.C.- Gasoline Pricing Inquiry
B.C.-Port Hardy Ferrochrominium Review Panel
B.C.-States Oil Spills Task Force
B.C. Utilities Commission
Ontario Energy Board
West Coast Oil Ports Inquiry
Western Grid Study Agreement

Indian Organizations

Ft. Nelson Indian Band
Lake Babine Band
Lax Kw'alaams Indian Band
Nisga'a Tribal Council
Tahltan Tribal Council

Public Sector / Crown Corporations

B.C. Ferries
B.C. Hydro
B.C. Resources Investment Corp.
B.C. Transportation Financing Authority
Manitoba Hydro
New Brunswick Electric Power Commission
Ontario Waste Management Corporation
Powerex
Saskatchewan Crown Investments Corporation
Saskatchewan Power Corporation

Private Sector Firms and Associations

Alcan Ltd.
Amoco Canada Ltd.
Arlon Tussing & Associates
Berger & Nelson, Barristers & Solicitors
Cassels, Brock & Blackwell, Barristers & Solicitors
Golder & Associates
Gulf Canada Ltd.
Industrial Gas Users Association
Inland Natural Gas Co. Ltd.
Inland Pacific Energy Services (B.C. Gas)
Lindsay, Kenny, Barristers & Solicitors
M.M. Dillon
Mobil Oil Inc.
Monenco Consultants Ltd.
Natural Gas Pipeline Company of America
Niagara Mohawk Power Corporation
Petro-Canada Inc.
Progas Limited
RBC Dominion Securities
Radcliff & Company, Barristers & Solicitors
Reid Crowther & Partners Inc.
Robert Falconer, Barrister & Solicitor
Sandwell, Swan Wooster
Shell Canada Ltd.
Triple A Enterprises Ltd.
Westcoast Transmission Ltd.
Western Gas Marketing Limited

Non-Profit Organizations

Canada West Foundation
Canadian Wildlife Service
Canadian Energy Research Institute

MSA



**ASSIGNMENTS COMPLETED
SINCE 1990**

February, 2004

Energy

BC Gas:- Analyzed the implications and provided policy advice on alternative regulatory policies respecting the pricing of natural gas and electricity, 2000- 2001.

BC Hydro:-With Alchemy Consulting and Constable Consultants, analyzed the opportunities and economic efficiency of NOx offset measures for the Burrard Thermal Power plant, 1999.

_____-: Prepared a report on the implications of commitments in the B.C. government's New Era document in relation to the Burrard Thermal plant, and reviewed and helped draft a response to a critique of BC Hydro's proposed Vancouver Island gas pipeline, 2001.

BC Ministry of Employment and Investment:- Provided advice on long term sales opportunities for the downstream power benefits owed to the province under the Columbia River Treaty. Also advised on the costs and benefits of long term power sales to proposed aluminum smelters in the province, 2001.

_____-: Analyzed the economic implications for the energy and mines sectors in a multiple account evaluation of alternative Mackenzie area land and resource management plans, 2000.

_____-: Reviewed analyses of the economic impacts, costs and benefits to the province and BC Hydro of a proposed aluminum smelter at Port Alberni, 2001.

BC Ministry of Energy, Mines and Petroleum Resources:- Acted as an advisor in the preparation of MEMPR's Energy Policy Paper "Our Energy Future", March, 1991.

_____-: Prepared a report "Integrating Environmental and Energy Values -- An Economic Perspective on Energy Policy for the 90's", April, 1990.

_____-: Prepared a report "Environmental and Economic Issues Related to Fuel Choice in Space and Water Heating in British Columbia", December, 1990.

BC Ministry of Environment, Lands & Parks:- Undertook a study entitled "Supply and Price Impact of Cleaner Gasoline Standards in British Columbia" 1995.

BC Ministry of Finance:- With Alchemy Consulting and Constable Consultants, prepared a multiple account benefit-cost evaluation of alternative strategies with

respect to the operation or closure of the Burrard Thermal Power plant, 2000-2001.

BC Ministry of Water Lands and Air Protection:- Prepared a report on the economic implications of alternative Kyoto implementation scenarios on Tech Cominco's Trail smelter and Elkford mine, 2002.

BC Utilities Commission:- Acted as Head of Inquiry Research in the BCUC's Inquiry into Gasoline Pricing in British Columbia, 1996

Berger & Nelson, Barristers & Solicitors:- Reviewed and advised on a report by Fisher Energy Consultants entitled "Economics for the Development of Oil and Gas Resources in Lot 9 and 27 of the Former Fort St. John Indian Reserve No. 172" in preparation for a trial -- *Apsassin v. The Queen*, 1997.

Columbia Power Corporation:- Analyzed the financial and environmental costs of a proposed coal-fired power plant compared to gas-fired combined cycle and hydro alternatives available in British Columbia, 1999.

_____-:Reviewed assumptions, methodology and report on a benefit-cost analysis of the Keenleyside 150 MW Power Plant project, 1998.

Electricity Table-National Climate Change Process:- Prepared a report on the environmental and health-related impacts of various options to meet target reductions in greenhouse gas emissions, 1999.

Greater Vancouver Regional District:- Provided advice on the market pricing of the electricity output from a proposed municipal waste incinerator turbogenerator project, 2001.

_____-: Reviewed existing provisions and alternatives respecting an agreement with BC Hydro to use water from the Coquitlam reservoir for domestic purposes, 2003.

Inland Pacific Enterprises Corporation:- Provided strategic advice on electricity marketing, independent power project developments, public-private partnerships, and other related matters, 1995-1997

Manitoba Hydro:-Prepared a multiple account benefit-cost comparison of developing the Wuskwatim hydro project versus a comparable amount of wind capacity, 2004.

_____-: Prepared a multiple account benefit-cost report on advancing the Wuskwatim hydro project for export, 2003

_____-:- Reviewed participation and benefit agreements between energy sector companies and First Nations and advised on participation options for Manitoba Hydro's hydro projects, 2001-2004.

_____-:- Prepared a contingent valuation study with the assistance of Prairie Research Associates Inc. entitled "Transmission Line Impacts on Wilderness Values – Phase III Report", March, 1992.

_____-:- Prepared a report "Environment and Economic Trade-Offs of Alternative Expansion Plans", March, 1990.

Mobil Oil Inc.:- With Brent Friedenberg & Associates, prepared a benefit-cost analysis and testified before an Environmental Assessment Panel on Mobil Oil's Sable Offshore Energy Project and the Maritime and Northeast Pipeline Project, 1997.

Powerex:- Chief Negotiator for the Province of British Columbia leading to agreements regarding the return of the Downstream Power Benefits under the *Columbia River Treaty*, 1995-1998.

_____-:- Prepared report on the evolution of western North America electricity markets in support of an application for a provincial energy removal certificate, 1999.

_____-:- Facilitated discussions between Whatcom County, Intalco and Powerex leading to commercial negotiation of a power supply contract, 2001.

_____-:- Reviewed application of risk capital concepts to the evaluation of gas plant tolling opportunities, 2003.

_____-:- Helped organize workshops on risk management, trading strategies, and accountability framework presented to Hydro Tasmania Board and staff, 2003.

RBC Dominion Securities:- Assisted in the economic and financial evaluation of alternative natural gas pipeline proposals and other matters, including the restructuring of BC Hydro and proposed purchases of energy sector firms, 1999-2001.

Fisheries

British Columbia Environmental Assessment Office:- Prepared a report and advised the Salmon Farming Review Committee on the Social and Economic Impacts from Current Salmon Farming Activity in B.C., 1997.

Fisheries & Oceans Canada, Pacific Region:- Prepared a study identifying linkages between the *Pacific Salmon Treaty* and Salmon Rebuilding Efforts in the Pacific Northwest, 1997-1998.

_____- Participated in an evaluation of DFO's Response to the **Report of the Fraser River Sockeye Public Review Board**, 1996.

_____- Prepared a report "Columbia River Salmon Rebuilding Program" that documented the objectives, nature and costs of United States efforts to rebuild salmon (and steelhead) in the Columbia River Basin, 1996.

_____- Together with LGL Limited prepared a report on the Evaluation Framework for the At-Sea Export Program, March, 1991.

_____- Prepared an update of the report "Long Term Salmon Price Forecasting Model," March, 1991.

_____- Prepared a report "Evaluation of Pacific Licensing, License Fee Policy and Their Impact on the Catching Power and Economic Performance of the Fleet", May, 1991.

Fisheries & Oceans Canada and Indian Affairs Canada:- Prepared a report "Potential Economic Benefits of SEP for Native Indians", April, 1990.

Nisga'a Tribal Council:- Assisted in the negotiations for a settlement of fisheries issues in the Nisga'a Land Claim.

_____- Prepared a report "Nisga'a Long Term Economic Development Plan", April, 1990.

Transportation

BC Ferry Corporation:- Provided advice on subsidy policy issues and rate impacts related to the possible restructuring of BC Ferries Corporation, 2002.

_____ - Prepared analyses of financial and regulatory requirements for achieving commercial status for BC Ferries, 1995

_____ - Prepared a report on options for an explicit BC Ferry Subsidy Policy, 1992.

BC Transportation Financing Authority:- Advised on various matters including tolling policy, revenue strategy for the Vancouver Island Highway Project, 1995-1997.

City of Coquitlam:- Reviewed terms of access agreements in the development of the Millennium Skytrain line, 2000.

Greater Vancouver Transportation Authority:- Led technical team in analyzing the feasibility, desirability, financing and implementation strategy for a new crossing of the Fraser River, 2000-2002.

_____ :- Prepared paper on bus service delivery options to improve cost effectiveness and performance, 2001.

_____ :- Prepared paper on the economic efficiency, potential revenues, administrative complexity and other characteristics of alternative pricing and taxation options available under the GVTA Act, 1999.

_____ :- Led contract negotiations to establish a contract for the operations and maintenance of the Skytrain system and related facilities, 1999

Greater Vancouver Regional District:- Co-Chair GVTA Transition Team responsible for implementing the GVTA agreement and *Greater Vancouver Transportation Authority Act*, 1998

_____ :- Chief Negotiator for the GVRD leading to agreements creating the Greater Vancouver Transportation Authority, 1997-1998.

Municipality of Whistler:- Advised on tolling policy issues in relation to the Sea-to-Sky Highway, 2002

General

BC Ministry of Environment:- Prepared an assessment and testified at Environmental Assessment Hearings on the social and environmental impacts of a ferrochromium plant proposed by Sherwood Metallurgical British Columbia Corporation for the Port Hardy Review Panel, 1992.

_____-: Prepared an evaluation of the an expanded deposit/refund system and the Blue Box system for beverage container recovery, 1992.

BC Ministry of Environment, Lands & Parks:- Assisted and advised Gary Holman in his report on the methodology for estimating the economic impacts of BC Lands' Sales and Tenure Program, 1996.

BC Ministry of Forests, Old Growth Values Team of the British Columbia Old Growth Strategy Project:- Prepared a report "Socio-Economic Evaluation of Old Growth Conservation Strategies - Demonstration of a Multiple Account Approach", May, 1991.

Canadian Council of Ministers of the Environment:- With Dillon Consulting Limited prepared a study to develop and apply an evaluation methodology identifying benefits of specific environmental programs, June, 1997.

Canadian Centre for Policy Alternatives:- Prepared a multiple account benefit-cost evaluation of the Vancouver-Whistler 2010 Olympic and Paralympic Games, 2003.

City of Surrey:- Reviewed the evaluation process used in the selection of a private partner in a Water Metering Incentive Program, 2000.

Golder Associates:- Prepared a report "Socio-Economic Assessment of Saskatchewan Wheat Pool/Cargill's Proposed Grain Terminal at Roberts Bank", 1996.

Greater Vancouver Regional District:- Assisted in the negotiation of a contractual agreement with Wastech Services for deliveries to Cache Creek landfill, and advised on the implementation of that agreement, 1997- 2000.

Greystone Properties Ltd.:- Conducted a multiple account evaluation of its proposal for a new trade and convention facility in Vancouver, 1997.

Miramar Mining:- Reviewed a contingent valuation study to establish the value of a lake proposed to be used in a mining operation, 2004.

Tech BC:- Conducted a multiple account evaluation, including consideration of financial, university and local development impacts, of alternative facility development strategies, 1999.