OGILVY RENAULT

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SENT BY EMAIL AND COURIER

Toronto, April 28, 2011

Kirsten Walli
Board Secretary
Ontario Energy Board
2300 Yonge Street
Suite 2700
Toronto, ON M4P 1E4

Dear Ms. Walli:

RE: Natural Resource Gas Limited 2011 Rates (EB-2010-0018)
Maintenance Protocol for IGPC Pipeline

Further to my letter of late last week updating the Board on NRG's proposed IRM model and the system integrity study, this letter updates the Board on the other outstanding item to be addressed in Phase 2 of the above-noted proceeding – namely, the quotes for maintenance of the dedicated pipeline to serve IGPC (the "IGPC Pipeline").

In its December 6, 2010 Decision in the above-noted proceeding, the Board disagreed with NRG's proposal to sole-source a contract with MIG Engineering Ltd. ("MIG") to maintain the IGPC Pipeline at an annual cost of $112,109. NRG had sought to contract with MIG on the basis that MIG had constructed the IGPC Pipeline on time and within budget, and MIG was most familiar with the IGPC Pipeline. NRG thought the MIG proposal was appropriate, and relied on MIG's expertise to determine what was required for the maintenance of the IGPC Pipeline.

The Board, however, stated that it was "concerned that the contract was sole sourced and there is not enough evidence that all the elements of the contract are required to fulfill the safe administration and maintenance of the [IGPC Pipeline]." As a result, the Board directed NRG to conduct two rounds of RFPs (requests for proposals) aimed at coming up with competitive bids to maintain the IGPC Pipeline. The first RFP would select an independent expert to prepare a maintenance protocol, while the second round would solicit bids to maintain the IGPC Pipeline

based on such protocol. The Board indicated that it would then review the proposed maintenance costs in Phase 2 of this proceeding.

This letter is to update the Board on the outcome of the first RFP round, and seek the Board's direction as to whether to proceed to select one of the first round bidders. NRG provided an earlier draft of this letter to IGPC late last week to provide them with notice of our intent to seek the Board's direction.

NRG sent the maintenance protocol RFP to three parties, but only two chose to submit bids (Worley Parsons Canada and Aecon Utility Engineering). These bids are attached to this letter. It took longer than expected to obtain the bids in part because it was difficult to find companies with expertise in the maintenance of high pressure natural gas pipelines.

As can be seen from the attached, the two estimates to prepare the maintenance protocol are $155,000 and $150,040 before taxes (which IGPC will be responsible for through rates). This does not include any time spent by NRG management preparing the RFP documentation, contacting the various potential RFP responders, legal support for the RFP process, etc. which are significant to date. NRG has concerns with the two quotes (explained below) and is seeking the Board's direction as to whether to select one of the two bids and then move to issue the second round RFP (to solicit bids for the actual maintenance work), or revert to the original MIG proposal filed by NRG.

Obviously, one concern is that the quotes to just prepare the maintenance protocol are disproportionate to the potential savings. Based on the two bids received and informal inquiries, NRG is concerned that soliciting second round bids may very well result in overall maintenance costs (which IGPC will be responsible for) as high as $500,000 annually, which far exceeds the MIG proposal. In addition, NRG is of the view that if NRG proceeds to have the maintenance protocol prepared, it may not be possible to then automatically revert to the MIG proposal if the second RFP round results in maintenance costs that are higher than MIG's costs. The reason for this is straightforward – if a qualified engineering company prepares a maintenance protocol that is more robust and costly than the MIG proposal, it is not open to NRG to then simply revert to the MIG proposal on the basis of a lower price. NRG would then have to exercise its business judgment as to what level of maintenance is most appropriate since the IGPC Pipeline is owned by NRG and its safe operation is NRG's liability risk. To this end, NRG is also including its first round RFP. In it, NRG seeks to ensure that the maintenance protocol be compliant with law and commensurate with good utility practice, and that it be appropriate for the protection of IGPC, NRG and the public at large. This is, in NRG's view, the appropriate standard/parameters for a maintenance protocol. NRG's concern is that if a maintenance protocol is now prepared on the basis of this RFP document by a qualified engineering firm, it will not then be open to NRG (should that protocol result in a much higher maintenance cost) to revert to the MIG proposal on the sole basis that it is lower cost.

Given that the maintenance cost of the IGPC Pipeline is to be dealt with in Phase 2 of the proceeding, we would appreciate the Board's direction on this matter as soon as possible.

Yours very truly,

Richard J. King

RK/mnm

Encl.

cc. All Intervenors and Observers

NATURAL RESOURCE GAS LIMITED

Request for Proposals ("RFP")

For an Independent Expert to
Develop a Maintenance Protocol for
a Natural Gas Pipeline

in the

Municipality of Thames Centre,

Township of Malahide

and

Town of Aylmer, Ontario

FEBRUARY 2011

TABLE OF CONTENTS

1.0 Introduction

Natural Resource Gas Limited ("NRG") owns and operates (as part of its natural gas distribution system in southwestern Ontario) a 28.5 kilometre dedicated steel (NPS 6) pipeline which provides natural gas to an ethanol plant located in Aylmer, Ontario (the "Ethanol Pipeline"). The Ethanol Pipeline is "dedicated" in that it supplies a single end-use customer (IGPC Ethanol Inc., or "IGPC") and is not interconnected with the rest of NRG's natural gas distribution system.

NRG wishes to ultimately enter into a contract for the safe administration and maintenance of the Ethanol Pipeline. The first step in this process is to retain (by way of this RFP) an independent expert to develop a Maintenance Protocol for the Ethanol Pipeline. Based on this Maintenance Protocol, NRG will issue a second RFP to maintenance companies to carry out the maintenance activities identified in the Maintenance Protocol.

2.0 Ethanol Pipeline

The Ethanol Pipeline is approximately 28.5 kilometres in length, and came into service in the summer of 2008. The Ethanol Pipeline is a dedicated steel NPS 6 natural gas pipeline. The Ethanol Pipeline interconnects with the Union Gas Limited natural gas distribution system north of Highway 401 on Bradley Avenue where the NRG franchise area abuts the Union Gas Limited franchise area. The Ethanol Pipeline route runs east along Bradley Avenue and then south along Highway 74 (Westchester Bourne Road) and zigzags along other smaller roads to the IGPC facility in Aylmer, Ontario. On Harrietsville Drive, the Ethanol Pipeline enters the Union Gas franchise area briefly in order to remain in the road allowance and avoid crossing private property, which includes a woodlot. The route traverses sections of the Township of Malahide, the Municipality of Thames Centre, and the Town of Aylmer.

The maximum operating pressure of the Ethanol Pipeline is 3450 kPa, with a guaranteed delivery pressure of 2070 kPa from Union Gas Limited. IGPC requires a delivery pressure of 420 kPa from NRG.

As noted above, the Ethanol Pipeline is not interconnected with NRG's natural gas distribution system.

3.0 Safe Administration and Maintenance of the Ethanol Pipeline

NRG is a natural gas distribution company operating in several municipalities in southwestern Ontario, pursuant to franchise agreements with these municipalities. NRG's main office is in Aylmer, Ontario.

NRG's operations are regulated by a number of entities, including the Ontario Energy Board and the Technical Standards and Safety Authority. With respect to the Ethanol Pipeline, NRG is seeking to establish a Maintenance Protocol to ensure the safe and responsible maintenance of the Ethanol Pipeline. The Maintenance Protocol shall have regard to the safety of IGPC (customer), NRG (owner) and the public at large.

This Maintenance Protocol should ensure compliance with all legal/regulatory standards in Ontario, be commensurate with good utility practice, and be consistent with the industry standard

for maintenance of similar facilities in Ontario. Potential elements of the Maintenance Protocol may include:

- above-grade pipeline valve maintenance
- above-grade piping and fitting maintenance
- pipeline marker and sign maintenance
- pressure testing
- pipeline repair and/or relocation procedures
- leakage surveys
- odour level testing
- cathodic protection surveys
- anode replacement procedures
- pipeline locate procedures
- pipeline route inspections/observations
- third party observation procedures
- depth of cover surveys
- access to special areas procedures
- development encroachment surveys
- emergency response procedures
- development of maintenance manuals
- training requirements for NRG staff
- community awareness programs
- procedures for making pipeline pigable
- in-line inspection tools/equipment

4.0 Independent Expert

As noted above, this RFP is the first RFP in a two-step RFP process. NRG's intention is to select an Independent Expert from this RFP process who will work with NRG to develop a Maintenance Protocol for the Ethanol Pipeline.

The Independent Expert should have experience in and familiarity with:

- the development of maintenance protocols or programs for pipelines similar to the Ethanol Pipeline; and,

- the Ontario regulatory requirements governing the operation and maintenance of pipelines similar to the Ethanol Pipeline.

The first part of any response to this RFP should consist of a statement of the candidate's qualifications, having regard to the bullet points noted above.

The second part of any response to this RFP should consist of the proposed workplan (with timelines) in order to complete the Maintenance Protocol (e.g., number of meetings with NRG staff, site visits, required documentation, etc.). NRG would expect the workplan to take no longer than one month.

The third and final part of any response to this RFP should consist of a fee proposal for completion of the work (i.e., preparation of a Maintenance Protocol that can be used in the second RFP issued to prospective third-party maintenance contractors). The fee proposal shall be inclusive of taxes and disbursements.

5.0 Evaluation of Proposals

Responses to this RFP from candidates will be evaluated on three criteria: (a) experience of the candidate in the development of similar maintenance protocols; (b) the reasonableness of the workplan being proposed, in NRG's view; and (c) the fee proposal. NRG is not ascribing any particular weighting or scoring to the three criteria, but will evaluate each response received in its entirety.

NRG may at any time following the submission deadline, request that any candidate clarify, make changes to, or provide supplementary documentation in respect of its response to this RFP, and such candidates shall submit responses to such request within five (5) business days following receipt of such request.

NRG may, at any stage in the RFP process, modify or supplement any and all requirements stated in this RFP. NRG may also cancel this RFP for any reason without any obligation or any reimbursement to any interested parties or candidates. Further, NRG is not bound to accept any response to this RFP and may proceed as it determines, in its sole and absolute discretion at all times, following receipt of responses.

Because this RFP is being prepared at the directive of the Ontario Energy Board, NRG will be required to submit any responses to this RFP to the Ontario Energy Board, which will be available to the public.

NRG is not liable for any costs incurred by a candidate in the preparation of its response to the RFP. Furthermore, NRG shall not be liable for any liabilities, costs, loss of profits, expenses, loss or damage incurred, sustained or suffered by the candidate prior to, subsequent to, or by reason of the acceptance, or non-acceptance by NRG of any response to this RFP, or by reason of any delay in the timelines outlined in this RFP.

6.0 Indicative Schedule for RFP Process

Distribution of RFP	February 25
Deadline for submission of response to RFP	March 18
Selection and notification of Independent Expert	March 25

7.0 Contact With NRG

The contact person for NRG in connection with this RFP is:

Jack Howley
General Manager
Natural Resource Gas Limited
39 Beech Street East
Aylmer, ON N5H 1A1
(519) 773-5321 ext. 205

8.0 Submission of Responses

The deadline for submission of responses to this RFP is March 8, 2011 at 4:00 p.m. Eastern Standard Time. Three (3) hard copies of each submission must be received in a sealed envelope at NRG's office (noted above), to the attention of Jack Howley. An electronic copy shall also be provided to howley@nrgas.on.ca.

The cover of the envelope containing the hard copy submissions must be clearly marked:

PROPOSAL
FOR
DEVELOPMENT OF PIPELINE MAINTENANCE PROTOCOL
FOR
ETHANOL PIPELINE
IN THE
MUNICIPALITY OF THAMES CENTRE,
TOWNSHIP OF MALAHIDE
AND
TOWN OF AYLMER, ONTARIO

Candidates are responsible for submitting their entire submission on time at the location specified above. The onus remains solely with each candidate to instruct its courier and delivery personnel to deliver its submission to the exact location specified above by the deadline indicated. NRG will not be responsible for late deliveries.

9.0 General Conditions

Each candidate, by responding to this RFP, expressly acknowledges the following:

Applicable Laws

The candidate shall comply with all applicable laws in force in the province of Ontario and the laws of Canada applicable therein, and any successor legislation.

No Conflict of Interest

The candidate shall declare immediately to NRG any conflict of interest, actual or potential, that arises during the course of evaluation of any response to this RFP or (if selected) during the completion of the Maintenance Protocol. If such a conflict arises and NRG requires same, the candidate shall take all such steps as NRG requires to remove such conflict of interest.

No Collusion

Candidates and their directors, officers, employees, advisors, agents and representatives must not discuss or communicate, directly or indirectly, with any other candidate or its directors, officers, employees, advisors, agents or other representatives regarding the preparation, content or representation of their responses to this RFP.

No Lobbying

Candidates and their respective directors, officers, employees, advisors, agents and representatives shall not, in relation to the RFP or the evaluation and selection process in respect thereof, engage in any form of lobbying whatsoever to influence the selection of the approved candidate.

WorleyParsons
resources & energy

WorleyParsons Canada
Calgary Division
#400, 10201 Southport Road S.W.
Calgary, Alberta T2W 4X9 Canada
Telephone +1 403 258 8000
Facsimile +1 403 258 5899
www.worleyparsons.com

Proposal # 11-047

24 March 2011

via email: howley@nrgas.on.ca

Natural Resource Gas Limited
39 Beech Street East
Aylmer, ON N5H 1A1

Attention: Mr. Jack Howley – General Manager

Subject: **RFP for Maintenance Protocol for the Ethanol Pipeline**

Dear Mr. Howley,

Thank you for considering WorleyParsons Canada Services Ltd. (WorleyParsons) for the provision of engineering services to develop the Maintenance Protocol for the Natural Gas Resource Gas Limited (NRG) for the 28.5 km NPS 6 natural gas pipeline near Aylmer, Ontario. In response to your request, we are pleased to submit our proposal, including our understanding of the scope of work, our plans for project staffing and execution, and an overview of the proposed services, cost and schedule.

1. Qualifications and Capabilities

WorleyParsons has extensive experience designing, constructing and maintaining high pressure natural gas pipelines for LDCs, gas transmission and production companies across Canada. We propose to execute this project utilizing the specialized expertise within our Pipeline Specialty Engineering Department. Attached for your information is a brochure covering the capabilities of this department.

Within the Specialty Engineering Department, we will utilize personnel with operations experience, integrity, regulatory, maintenance, ILI, valves/materials and other specialty resources necessary for the development of the documents. We are confident that the necessary expertise to create the protocols for the potential elements listed in the RFP reside within the project team or are available for consultation within the Specialty Engineering Department.

2. SCOPE OF WORK

The scope of work for the development of the maintenance protocol is based upon the information provided as per request for proposal ("RFP") dated February 2011 and is limited to 28.5 kilometer

NPS 6 carbon steel pipeline which provides natural gas to IGPC Ethanol Inc. (IGPC) plant located in Aylmer, Ontario. The maximum operating pressure of this pipeline is 3450 kPa with a guaranteed delivery pressure of 2070 kPa from Union Gas Limited and a required pressure of 420kPa from NRG to IGPC.

The maintenance protocol shall ensure compliance with all regulatory requirements in Ontario and shall be consistent for industry standards for maintenance for similar facilities.

The key elements of the protocol shall include the followings elements as mentioned in "RFP":

- above-grade pipeline valve maintenance
- above-grade piping and fitting maintenance
- pipeline marker and sign maintenance
- pressure testing
- pipeline repair and/or relocation procedures
- leakage surveys
- odour level testing
- cathodic protection survey
- anode replacement procedures
- pipeline locate procedures
- pipeline rout inspection/observations
- third party observation procedures
- depth of cover survey
- access to special areas procedures
- development encroachment surveys
- emergency response procedures

- development of maintenance manuals
- training requirements for NRG staff
- community awareness programs
- procedures for making pipeline pigable
- in-line inspection tools / equipment

This project is divided in three phases to allow ample communication and feedback from NRG, therefore the scope of work may be adjusted to optimally meet NRG and regulatory requirements. There is a review period at the end of each phase for NRG to review and comments on the deliverables prior to its issuance.

3. EXECUTION PLAN

WorleyParsons proposes to perform the work in three phases:

Phase 1: Project kick off

Evaluation of available data from NGR, local regulatory requirements, as built drawings / engineering data on the pipeline and field trip for visual inspection of the pipeline, the right of way and related facilities.

Deliverable: Update of the project execution plan and agreement on the rest of the scope of work

Phase 2A: Public awareness program

This stage of the execution plan shall cover the general documentation relevant to the public or community and shall include items such as:

- community awareness program
- 3rd party observations
- pipeline marker and sign maintenance
- odour level testing

Complete information on the schedule of each item in this phase in included in the attached Microsoft Project "NRG Preliminary Schedule" sheet.

Deliverable: The deliverables of this phase shall cover agreed documents against each element prepared by WorleyParsons, agreed by NRG and signed by both WorleyParsons and NRG.

Phase 2B: Maintenance Programs

Maintenance program phase shall cover rest of the documents required for the pipeline as requested in the RFP and as agreed in phase 1 of the execution mentioned. This phase shall not include manuals development which is covered in the next phase as the manuals will essentially require the information developed during phase 2 and 3. As per RFP the elements covered in this phase are:

- above-grade pipeline valve maintenance
- above-grade piping and fitting maintenance
- pressure testing
- pipeline repair and/or relocation procedures
- leakage surveys
- cathodic protection survey
- anode replacement procedures
- pipeline locate procedures
- pipeline rout inspection/observations
- depth of cover survey
- access to special areas procedures
- development encroachment surveys
- procedures for making pipeline pigable
- in-line inspection tools / equipment

Deliverable: The deliverables of this phase shall cover agreed documents against each element prepared by WorleyParsons, agreed by NRG and signed by both WorleyParsons and NRG.

Phase 3: Manual Development

Once all of the public awareness and maintenance related documents are developed. The following manuals shall be developed as final phase of the project.

- Emergency response manual
- Maintenance manual
- Training presentations / manual (as applicable and agreed)

Deliverable: Manuals and/or presentations as agreed during phase 1.

4. PROJECT PERSONNEL

The personnel named in this proposal will execute the majority of the work discussed herein. Other personnel not named herein, such as technical subject matter experts and administrative personnel will be drawn upon to support executing the work.

• Dan Hoang	Sr. Integrity Engineer
• Roman Motriuk	Pipeline Engineer
• James Kozlowski	Sr. Pipeline Engineer
• Russ Young	Sr. Materials Engineer

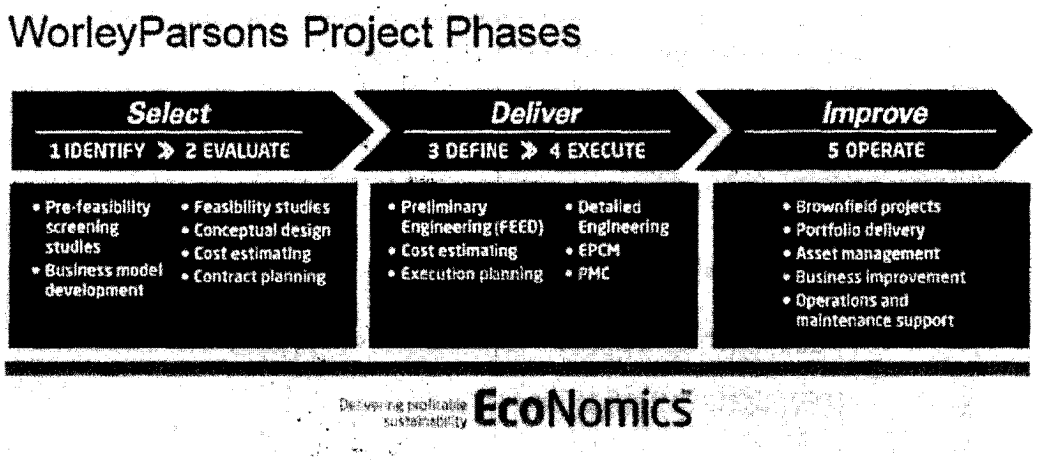
The project team has been selected to provide all of the skills required to complete the proposed project, and to provide continuity throughout the project. This team is available immediately, and for the duration of the project.

The resumes of personnel identified above are attached to this proposal. Resumes of other personnel not specifically named, but assigned to the project can be provided at NRG's request.

5. WORLEYPARSONS EXPERIENCE

From large diameter, long distance transmissions pipeline systems to small inch gathering and distribution systems, WorleyParsons has designed and managed the construction of more than 90,000+ kilometers of pipeline; pipeline related facility and terminals installed worldwide and exposed to various environments.

With over 1000 pipeline specialists and multidiscipline personnel, we have the expertise and capability to work with our customers any phase of the project; as represented in the WorleyParsons Project Phases Model below:



NRG requirements for the development of maintenance related documents and manuals falls under our "***Improve***" phase and WorleyParsons is readily working with many oil and gas companies in Canada and worldwide on project to project basis as well as in alliances to provide support on:

1. Prepare missing documentation from the design phase, such as Corrosion Management Manuals, Risk Based Inspection (RBI) regimes, Asset Integrity Management Systems (AIMS), Pipeline Integrity Management Systems (PIMS), Risk Directed Integrity Management (RDIM) programs, maintenance management programs etc.
2. Provide ongoing corrosion and materials support during operations and/or for upgrades and de-bottlenecking projects
3. Perform failure investigations, root cause analyses, fitness for service evaluations and remaining life assessments

Brochures of our improve business unit, Specialty Engineering and Asset Integrity are included in this proposal to cover all aspects of the NRG requirements.

6. COMMERCIAL TERMS

6.1. Contract

As there is no current contract in place between WorleyParsons and NRG, this proposal is contingent upon the negotiation of a mutually satisfactory set of terms and conditions governing the work. Negotiation and execution of this contract must take place prior to commencement of any work.

6.2. Fees

WorleyParsons proposes to undertake the Scope of Work as described in Section 2 on a reimbursable basis. Reimbursable hourly rates shall apply to all personnel for such time as they are directly engaged in the performance of the work while at WorleyParsons' home office or while traveling in connection with the work.

The hourly reimbursable charge rate for staff personnel and direct hire contractor or agency personnel shall be established as follows:

$$\text{Staff} = \left(\frac{\text{Annual Salary}}{2080} + \text{Employer Hourly RRSP Contribution} \right) \times \text{Multiplier}$$

$$\text{Contract/Agency} = \text{Hourly Rate} \times \text{Multiplier}$$

For Home Office work, the Multiplier applicable to staff personnel shall be 2.0 and the Multiplier applicable to direct hire contractor or agency personnel shall be 1.72.The key personnel listed in Section 4 will execute the scope of work discussed in this proposal. Other personnel, not named herein, will be drawn upon to support executing the work.

These multipliers are inclusive of all engineering service fees, payroll burdens and benefits, office overhead and operating costs.

6.2.1. Disbursements and Expenses

The multipliers listed above include all office technology fees and general disbursements, but exclude project related travel costs, and bulk reprographics which will be chargeable on a reimbursable basis with a ten percent mark-up for handling.

6.2.2. Third Party Costs

NRG will pay WorleyParsons the billable net cost of third party consultants and subcontractors retained by WorleyParsons to assist in the completion of the work, as needed and with the prior written approval of NRG, with a ten percent mark-up.

Based on the understanding of the scope, WorleyParsons does not anticipate any third party services.

6.2.3. Escalation

WorleyParsons reserves the right to adjust the rates of staff and contractors twice annually, in response to market conditions. This can occur on January 1 and July 1 of every year.

6.2.4. Variations

The rate structure set forth herein shall be used for additions and/or deletions to the work approved in writing by NRG and confirmed by a Variation Order executed by NRG, and will be used as back-up to confirm cost reimbursable changes.

6.3. Commercial Terms and Costs

Based on the scope of work presented in Section 2, the Execution Plan presented in Section 3 and WorleyParsons' current understanding of NRG's requirements for engineering services to complete the subject work, we estimate the cost of our services to be $155,000 (CDN). This represents our estimate of 900 hours to complete the work.

7. CONTRACTUAL COMMITMENT AND VALIDITY

As there is no current contract in place between WorleyParsons and NRG, this proposal is contingent upon the negotiation of a mutually satisfactory set of terms and conditions. Execution of this contract must take place prior to commencement of any work.

WorleyParsons will hold this proposal valid until 15 April 2011. Should this proposal not be accepted by NRG within this time frame, WorleyParsons would request the opportunity to reassess and resubmit this proposal, should NRG still desire to execute the subject work.

We believe that WorleyParsons has the comprehensive and proven capabilities and hands-on experience to provide the NRG team with the best experience available in the industry. We look forward to working with your team to get this project completed quickly and efficiently.

Should you have any questions or require further information regarding the foregoing, please do not hesitate to contact the undersigned at 403-258-5885, or Noman Faridi at 403-212-8306.

Yours sincerely,
WorleyParsons Canada Services Ltd.

Ron Burdylo, P.Eng
for Manager, Pipeline Specialty Engineering
Pipeline Systems Business Unit

WorleyParsons
resources & energy

Dan Hoang, B.Sc., P.Eng.

Senior Pipeline Integrity Engineer

Resume

SUMMARY

Dan Hoang is a Professional Engineer (P.Eng.), with over 16 years experience in the Pipeline Integrity, Geomatics, Electrical Power Systems, and Information Technology. Dan has proven abilities to deliver on projects in both Technical and Managerial Capacities for a diverse array of clients. His experience on Pipeline Integrity projects with large clients such as Colt Engineering, TransCanada, GE and Dynamic Risk Assessment Systems have afforded him with a detailed understanding of the key facets of Pipeline Inspection & Maintenance, from instrumentation through to data analysis.

Dan's combination of formal training, practical experience, leadership and excellent interpersonal skill provides a great degree of flexibility to the roles which he is capable of tackling for any given project.

EXPERIENCE

2007 – Present **Senior Pipeline Integrity Engineer, WorleyParsons, Calgary, AB, Canada**

Confidential Client – Project Pinnacle. Project Management to lead a team of subject matter experts and integrity engineers to evaluate the entire pipeline asset of a major oil and gas company for possible purchase on behalf of a large investment firm.

Syncrude Canada Ltd. – Aurora Pipelines Master Database ($1 million). Project Manager for a pipeline database system utilizing GIS, internet, and pipeline industry PODS database model to facilitate management of pipeline integrity.

2006 – 2007 **Senior Geomatics Engineer, TransCanada PipeLines, Calgary, AB, Canada**

Project Engineer to provide technical guidance and lead a team to integrate 65,000 km of legacy and newly purchased pipeline data to a centralized data management system. Managed contractors and Information Technology staff to provide quality control, and data acceptance. Create data quality acceptance guidelines for existing US acquisitions, and in preparation for the construction of the Keystone pipeline. Provide technical expertise on risk assessment models and improvements to existing algorithms.

2005 – 2006 **Senior Geomatics Engineer, Colt Geomatics Solutions Ltd., Calgary, AB, Canada**

Imperial Oil Resources Ventures Limited – Mackenzie Gas Project. Project Engineer to provide GIS tools for MGP to submit for government approvals such as borehole and aquatic data. Utilize 3-D animation data and software development for quality assurance of access, through vehicle transportation modeling, for transport of oversized vehicles from various sources to the staging destination in Inuvik NWT. Delivered interactive software to assist cost estimates, training and governmental approvals.

Resume

2003 – 2005 **Program Manager, GE Pipeline Integrity International, Calgary, AB, Canada**

Program Manager to create an accurate pipeline inspection tool using Six Sigma. The result was a successful launch of a service offering of Internal Mapping Unit (IMU). Currently GE PII is one of only two companies in the world who can promise the IMU accuracy standards.

Pemex and Petrobras, South America - Program manager to manage, execute, train and support the geometry, MFL, HR, IMU pipeline inspections.

Enbridge, TCPL, Williams Gas, North America – Program manager to manage, execute, train and support the geometry and IMU pipeline inspections.

Ruhr Gas, Europe - Program manager to train and support the geometry and IMU pipeline inspections.

2001 – 2003 **Project Manager, Dynamic Risk Assessment Systems, Calgary, AB, Canada**

Managed the IT and engineering team to develop risk assessment models using pipeline information and expert knowledge to represent risks and consequences for the entire company asset.

Duke Energy, Exxon Mobil, Union Gas, Canada and US – Risk assessment implementation

Presentation of risk assessment technologies and services to BP, Enron and at the GeoTec conference.

2000 – 2001 **Consultant, Citibank, Edgewater, NJ, USA**

Consultant and team lead to enhance a large centralized application that manages mortgages; the complex software interacts with Fannie Mae and Freddie Mac middle-ware services, and is used for the full lifecycle of the mortgage application. Enhanced risk recognition capabilities through artificial neural networks, and create risk rankings.

2000 – 2001 **Partner, Kamiak, New York, NY; Cheyenne, WY, USA**

This is a classified military software project for the US Navy to determine the capability of control for autonomous robots. I was a partner in Kamiak that developed the data requirement and software for communication service discovery.

1998 – 2000 **Consultant, Case New Holland, Burr Ridge, IL, USA**

Consultant on a globally-selected software development team that created a suite of smart farming interfaces to maximize farming production. The suite of software products interacts with farm equipment to inject seeds and nutrients; and also verify the results at harvest. The technologies used included yield monitors, product analyzers, GIS and GPS. The software is distributed world-wide in 5 languages and won best 50 products in the farming industry.

1998 – 1999 **Consultant, Illinois Tool Works, IL, USA**

Team lead to implement an Enterprise Resource Planning (ERP) system in a large manufacturing plant. The ERP system automatically orders inventory to produce the require ordered products, the technologies used are interactions with electronic scales, data tracking through bar codes and a large database system to deliver Just-In-Time inventory management. Enhanced the ERP to accurately calculate employee bonuses production output and reduction in waste materials.

1997 – 2000 **Product Manager, Daxxes Geospatial Systems, Calgary, AB Canada**

Lead a team of software developers and managed a suite of software products for the mapping and GIS industry. The map vector cleaning software product is licensed to Intergraph. Selected as a key personnel of a 500 employee global company to participate on a trial project on asset data integration for telecommunications companies in the US and Australia.

1997 **Consultant, Shaw Telecommunications, Calgary, AB, Canada**

Lead consultant to integrate two existing fiber optics database systems in Calgary and Toronto, the delivered products sends updates and communicates using telephone modems.

1991 – 1996 **Consultant, City of Calgary, Calgary, AB, Canada**

Mapping ($7 million) – responsible for the quality control of the digital map submission by consultants in the Calgary Spatial Information Project, the resulting product has all city managed assets and the spatial location is accurate to 15cm. Enhanced the land titles remote search capability, and assist in the map datum update from NAD27 to NAD83. Create 3-D terrain and simulations for an Expo bid and the Canada Olympic Park ski hills.

Calgary Police ($NA) – consultant to deliver a prototype navigation system for the newly acquired police helicopter, the mapping system replaced paper maps and has smart search capabilities. All three members of this project received a letter of recognition from Police Chief Christine Silverberg. Utilize GIS to track and for pattern recognition regarding stolen vehicles and hydroponic operations.

1987 – 1991 **Electrician, Calgary, AB, Canada**

Part-time electrician in the family owned business to provide commercial and electrical services. Princeton Electric donates $5000 each year to the Alberta Children's Hospital.

EDUCATION

B.Sc. Geomatics Engineering, University of Calgary, 1991

MBA, Information Technology, University of Athabasca, 1999 (not completed)

Electrician, Alberta Apprenticeship and Industry 2009

REGISTRATIONS/AFFILIATIONS

Association of Professional Engineers, Geologists and Geophysicists of Alberta (APEGGA)

NACE International

PUBLICATIONS/PRESENTATIONS

"Modeling of Oil Spill Flows", GeoTec 2002

SPECIFIC TECHNICAL EXPERTISE/SPECIALIST COURSES

Six Sigma

Information Technology and Management

Power Systems

H2S, First Aid, CPR

Handling hazardous materials

Working in confined spaces

WorleyParsons
resources & energy

Roman W. Motriuk, M.Sc., P.Eng. P.E.
Pipeline Engineer

Resume

SUMMARY

- 25 years experience as a principal engineer, engineering lead, pipeline engineering specialist and vibroacoustic expert.
- Recognized expert in pipelines, compression, rotating equipment and piping stress (over 30 publications).
- Worked on Pipeline Integrity Programs with emphasis on fatigue and flaw assessment.
- Has worked extensively on fluid transmission systems, on SAGD and floatation bitumen extraction technologies (Long Lake South, Kearl, Albian, Muskeg River and all Horizon projects).
- Recently participated in the FEED or DETAIL designs in a number of standalone pipeline projects which conveyed sour gas, sweet gas, crude, steam, CO_2, slurry and water. The SAGD and Floatation projects are currently used or being implemented in the process of bitumen extraction or fluid transportation.
- Comprehensive experience in refining and large volume transmission facilities as well as in vibroacoustics, noise control, pulsation flow control, stress, and hydraulics.

EXPERIENCE

2011 – Present **Pipeline Engineer, WorleyParsons, Calgary, AB Canada**

Talisman – Montney Core Project. Stress analysis for buried HDPE NPS 10 and NPS16 water and reclaimed water pipelines. Worked on phase I through V of the project which dealt with water and reclaimed water delivery to 19 well sites. The assignment included numerical representation of pipe soil interaction, determination of soil supports, pipe anchor designs, hydraulic shock loads, pipe buckling under soil weight, vacuum and dynamic road loads at crossings. Several types of soil were considered, muskeg, clay, till, granular.

Husky Energy - Sunrise. Preliminary stress evaluation of side-bends for hot water pipeline (buried NPS 4 pipeline). The assignment included evaluation of pipe soil interaction and focused on specification/design of the soil supports and analysis of optimum side bend radii along the pipeline route. The allowable stress constituted a base for the design.

Teck Coal Ltd. – Line Creek Mine - Creek Diversion Economic Assessment

- Stress calculations for buried and above grade piping
- Steel and HDPE (plastic) pipeline designs
- Analysis of different pipe-soil interactions and pipeline crossings

2009 – 2011 **Principal Pipeline Engineer/Manager, Arcus Solutions Inc., Calgary, AB Canada**

- Versed in CSA Z662-07, B31.3, B31.8, 31.4, B31.11, ASME Div VIII, B31.1.
- Versed in soil support models (developed by Nova AGTD, Autopipe and others).
- Consulted on technical advances in pipeline technology developments.

- Carried out pipeline stress calculations, pipe-soil interaction (soil supports), pipe anchor designs, riser, expansion loop designs, pipeline response to occasional extreme loads, mechanical vibrations, hydraulic shocks, vortex shedding, preventing piping collapse, evaluating support stresses, support spacing, etc.
- Designed several pipelines ranging in size from NPS8 to NPS60 (buried and above grade, in muskeg, in ordinary soil, under road and rail crossings, risers, bends, etc.) transporting water, natural gas and crude oil.
- Developed the EOLSS encyclopedia section for UNESCO entitled "Pipeline Structural Integrity",
- Developed a method to model Victaulic's connectors published as **"Modelling of Flexible Victaulic Couplings Using Basic Finite Element Software"**, in ASME Proceedings of International Pipeline Conference 2008 Calgary, September 29 to October 3.
- Performed numerous dynamic analyses of natural gas de-sanding facilities using stress and noise levels as the evaluation criteria
- Carried out extensive stress testing for SAGD well-pads, pipelines for steam injection, process, syn-gas, casing gas, etc.
- Performed many dynamic analyses of water injection pump systems, including prediction of pulsation and transient pressures in piping/pipelines and support loads. Evaluation of the system based on stress and vibration and impact levels threshold.
- Lectured Graduate Course on Vibration in Pipeline Systems, ENME 619.50
- Developed stress layout for LM1600 powered compressor stations, for AGTD (1994)

2008 – 2009 **Pipe Stress Lead, WorleyParson/Arcus Solutions Inc., Calgary, AB Canada**

Nexen – Long Lake South Project

- Managed and led the Piping Engineering Group. Responsible for material, welding and pipe stress issues. Performed front-end layout and design of complex systems and equipment.
- Provided expertise in pump system transient analyses for numerous OTSG/Boiler Feed Water systems. Ensured that piping designs were adequate, complete, properly routed and conformed to the given piping specifications.
- Carried out Slug and Surge analysis using Caesar II, and BOS packages for water/steam injection processes.
- Performed interdisciplinary reviews and provided coordination of data to ensure a design compatible with existing facilities.

2006 – 2008 **Stress Engineering Lead, AMEC – Natural Resources Division, Calgary, AB Canada**

Imperial ESSO, Kearl Project.

- Worked exclusively on the Feed Stage with an emphasis on piping stress resolution in froth area. Carried out stress analyses in accordance with ASME B31.3 and B31.11 Codes.

Shell Canada – AOSP (Albian) Expansion Project

- Performed detailed piping designs with optimization of flow, erosion and kept the design to meet the stress criteria (middling system, PSC tower, and auxiliary piping and vessels). Designs carried out according to Shell's internal requirements and specifications supplemented by B31.3 and B31.E14 codes.
- Designed the Dearator, froth screens, air process blower systems including the equipment adequacy verification.

Canadian Natural Resources Ltd. – Horizon Project (Phase I, II and modified)

- Carried out internal audit of thrust force calculations, anchor designs, pipe-soil interaction and computer modelling methods. Also, as a result of the above, represented AMEC at the TD Williams external audit.
- Designed large diameter (NPS 60/48/36) Vacuum Syphone/Pipeline according to ASME B31.3 and API pertinent standards.
- Managed and led the Stress Group for the Horizon Project, "Phase I". In addition, carried out the EDS stress design for the next stage of the Horizon Project Expansion, Phase II (worked on NRU, Hydrotransport and Tailings).
- Managed and led the EDS stress design for a scaled-down Horizon Project, Phase II ("3/4 model").

2005 – 2008 **Principal Engineer/Manager, Arcus Solutions Inc., Calgary, Montreal, Sarnia**

PEMEX/Pipeline Engineering Centre

- Performed benchmarking of pipeline integrity programs in Europe/USA/Canada and Mexico. Set up the appropriate benchmarking process to be used.
- Managed, and performed work leading a team of professional engineers and students.

Expert Witness to the Court of Queens Bench

- Prepared a case and described the root cause of a dynamic failure in the power generation plant (torsional shaft failure).

Rolls-Royce Project

- Rolls-Royce – Re-commissioned the entire line of the 'Trent' engine (4 gas turbines).
- Rolls-Royce 60MW – measurements and attenuation of noise in the electricity generation facility.

TransCanada Pipelines –

- Developed the methodology to assess integrity of piping exposed to high frequency vibrations.

- Performed environmental noise study for Station 132 in Ontario to represent TransCanada at the National Energy Board.
- Predicted and worked on attenuation of flow-induced pulsation and vibration in the gas transportation facilities, for TQM in Quebec

TransAlta

- Elimination of steam turbines (14MW) speed restrictions in a super-heated steam generation plant - Sarnia's steam generation facility.

2003 – 2005 **Principal Engineer/Manager, Arcus Solutions Inc., Calgary/Sarnia**

Suncor – Genesis Project- Sarnia.

- Managed and performed calculations and carried out a dynamic design of hydro-cracking pressure let-down and flare systems (vibration-noise predictions and control)

PetroCanada – Mississauga Refinery

- Managed and performed calculations and carried out a dynamic design of hydro-cracking pressure let-down and flare system (vibration-noise predictions and control)

1988 – 2003 **Vibroacoustic Expert/Lead, TransCanada Pipelines, Calgary, AB Canada**

- Carried out engineering studies combined with field assessments; control of pulsation, vibration and noise in centrifugal and positive displacement stations; resonance elimination in gas generators and power turbine hydraulic systems; elimination of acoustic 'boom' in LM1600 gas turbines; excitation control of inlet guide vanes through optimization of the lift and drag forces; root cause analysis of shaft failures using rotor dynamics including torsional and bending stresses; flow accuracy measurements and error determination caused by unsteady flows.
- Actively coordinated and participated in over 30 R&D projects, e.g. projects on dynamic assessment of turbo-compression; noise silencing; complex flow patterns; complex vibration and measurement errors; valve dynamics.
- Developed the industry standards, for example, designing the thermowell application standard to avoid high frequency vibration failures; established Alberta Energy Utility Board (AEUB) regulatory directive on low frequency noise compliance (2002 Directive).
- Worked on international assignments, for example, dynamic assessments of compressor and piping systems in Mexico, Malaysia and Taiwan; Was invited as a guest speaker at International Forums: in San Francisco, in Texas and in Calgary.

1986 – 1988 **Vibroacoustic Engineer, Beta Machinery Analysis, Calgary, AB Canada**

- Preformed engineering studies combined with field assessments, e.g. dynamic analysis of high pressure piping systems using pulsation/vibration and stress levels as the evaluation criteria; Carried out torsional analysis of shafts – pressure loads; elimination of pulsation

and vibration problems in positive displacement and centrifugal pump/compressor systems using field tests and office analysis (over 25 pump/compressor stations)

- Worked extensively on software development which included changes to the in-house MAPAK and RECOM acoustic packages (pressure losses, compressor valve dynamics, acoustic source strength, centrifugal pumps)
- Successfully carried out the R&D for Alberta Research Council entitled "Pulsations in Plunger Pump Systems Incorporating Centrifugal Booster Pumps".

EDUCATION

Masters of Science, Mechanical Engineering, Acoustics, University of Calgary, Calgary, 1986

Masters of Science, Mechanical Engineering, Mechanical, University of Science and Technology, Cracow, Poland, 1979

REGISTRATIONS/AFFILIATIONS

Registered Professional Engineer in Alberta, Ontario (Canada) and Texas (USA),- P.Eng. & P.E.

Co-founder of the Pipeline Engineering Centre (PEC) at the University of Calgary – 2003

University of Calgary Adjunct Professor (Graduate Program Lecturer – Pipeline Dynamics)

Member of the Fluid – Solid Interaction (FSI) ASME Committee – 1998 – Present

Co-Organizer of the Flow–Induced Vibration sessions at ASME - PVP conferences: Boston & Atlanta – 1998 – 2000

Past-Chairman of the Calgary Technical Chapter of ASME-PSD – 2000 – 2003

Member of the ASME PSD Executive Committee - 2002 - Present

Co-Chair CEPA/ASME International Pipeline Conference – September - October 2004

Member of the CEPA/ASME International Pipeline Conference Organizing Committee – 2008, 2010

SPECIFIC TECHNICAL EXPERTISE/SPECIALIST COURSES

Expert in acoustic software and its use in the oil and gas industry, expert in Caesar II package and its use in the pipe-soil interaction analyses, well versed in BOS Fluids transient modeling, and fluent in in-house applications (structural, acoustical, environmental noise and others etc.), as well as standard applications like MS Office.

WorleyParsons
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James Kozlowski, P.Eng.
Project Manager

Resume

SUMMARY

Mr. Kozlowski, P. Eng., is a Project Manager/Project/Pipeline/Operations/Facilities/Integrity/ Engineer/Consultant with over thirty (30) years' experience in the oil and gas industry. He is experienced in the areas of project management/ engineering/consulting, design, operations, construction and integrity, involving all elements of pipelines systems from mainline to facilities in areas of pump stations, terminals, battery, plant and well tie-ins, sour gas facilities, hydrotesting, hydraulic analysis, permits and licensing, regulatory involvement, linalog, repairs, road, muskeg and river crossing, upgrading, expansions and additions to existing facilities.

EXPERIENCE

2006 – Present **Project Manager/Engineering Consultant (Access Pipeline (Devon & MEG), Calgary, AB, Canada**

- Various Operation Projects, Integrity Program, Odour Investigations/Solutions to Odour Management Plan for Regulatory, Foreign Crossing Loads Designs and Agreement Validation, MOC Projects, Butane Truck Unload Terminal Preliminary Design and Cost Estimate.

2007 – 2008 **Sr. Design Engineer Consultant, IMV Projects, Calgary, AB Canada**

- CNRL Primrose Heavy Oil Bend System 30km 24" & 20"

2004 – 2007 **Project Manager/Facility/Integrity Engineer Contractor, Paramount Resources Ltd., Calgary, AB Canada**

- Rollout, follow ups and support of the Integrity Pipeline Operation and Maintenance Program. Various integrity/corrosion issues, studies and implementations for facilities and pipelines.
- Facility Engineer for Bistcho Sour Gas Plant and Cameron Hills Sour Oil Battery and Compressor Station with associated wells, pipelines, Management of Change items and equipment additions.
- Project Manager for Winter Construction Programs for Sour Gas and Oil Well Site Facilities and Associated Pipeline Tie-ins.

2003 – 2004 **Project Manager/Engineer, Grantech Engineering Ltd., Calgary, AB Canada**

- Olympia Lochend Compression Battery
  - 1200 HP compressor, separator, dehy and HCL storage with VRU.
- Olympia Moon Creek Pipeline
  - 29 km of 168.3 mm sour gas pipeline in the Grande Cache area.
- Olympia Moon Creek Facility
  - 700 HP compressor, dehy and 2500 ansi gas well.

Resume

2002 – 2003 **Sr. Technical Consultant, Moduspec Risk Management Services Canada Ltd., Calgary, AB Canada**

- Enbridge-MacKay Station & Athabasca Terminal
  - Commissioning and Operation Procedures written for a bitumen/diluent pipeline facility.
- Shell Burnt Timber Plant, Husky Burnt Timber System, Devon Valhalla Battery
  - Safe Guarding/Loss Control Inspection and Reporting

2000 – 2002 **Project Manager/Sr. Project Engineer, Titan SNC-Lavalin (formerly Titan Projects Ltd.), Calgary, AB Canada**

Pembina Pipeline Corporation – AOSPL Stage 3 Looping - Design of PFD's, Plot Plans and Piping Arrangement Drawings.

TransCanada – Peerless Lake Lateral: 89 km, 30 inch gas transmission - Project Execution Plan and Geotechnical Investigation of River Crossings.

AEC Oil and Gas Ltd.

- Senior Project Engineer/Manager for a 36 to 11 well sour/sweet gas facilities, tie-ins and gathering project (Gordondale);
- Senior Project Engineer/Manager for a 65 to 48 well sweet gas tie-ins and gathering project (High Level);
- Responsible for all design, pipeline and facilities, cost estimates, budgets, drawings, contracts, prefabrication, material selection/order, cost control, co-ordination and management with operations;
- Inspection and construction management of well site facilities, new flow and gathering lines from the well heads to the existing gathering systems tie-ins.

1997 – 2000 **Project Lead/Project Engineer, Colt Engineering Corp., Calgary, AB Canada**

Corridor Pipeline Ltd., - Corridor Pipeline Project

- Senior Pipeline Engineer on design for 550 km, 24", 20", 16" and 12" crude oil, diluent and products pipeline system and facilities;
- Responsible for geotechnical field survey program design and execution for major water crossings;
- Construction cost estimating, preliminary design of block valve and trap facilities; coatings review and performance evaluation report; pipe, coatings, equipment and contractors' pre-qualification reviews.

ANG Gathering & Processing Ltd.- Central Foothills Sour Gas Gathering System

- Project Engineer and Pipeline Lead/Manager on a 240 km, 8" and 12" gas gathering pipeline and facilities;

- Responsible for all activities of pipeline, facilities designs and associated drawing activities from design to the construction support of a sour, wet (27% H_2S, 9% CO_2) natural gas pipeline gathering system and facilities through numerous areas of muskeg.

Alberta Energy Company - Lakeland Heavy Oil Pipeline Project

- Project Engineer on a 550 km, 24" heavy oil pipeline. Responsible for system design and routing of the pipeline;
- Also headed design and coordination of all facility drawings associated with the mainline and pumping stations.

TransCanada Pipeline Ltd. - TransMaritime Gas Transmission Project

- Responsible for the design criteria and detailed cost estimates for 8"-12" laterals, line routings, crossings and compressor stations of a 650 km, 24" and 30" natural gas line

1994 – 1997 **Project Manager/Sr. Pipeline/Project/Field Engineer, Gulf Canada Resources Ltd., Calgary, AB Canada**

Gulf Canada Resources Ltd. – Rimbey Plant Pump Station

- Responsible for the project facility work, design, cost estimating drawings, bid, award, construction management and commissioning in addition to butane pump replacement and piping modifications at the Rimbey Plant Pump Station.

Gulf Canada Resources Ltd - Edmonton Terminal Storage Expansion

- Responsible for the project facility work, design, cost estimating drawings, bid, award, construction management and commissioning of three large bullets in addition to prover and pump replacements and associated piping modifications at the Edmonton Terminal.

Gulf Canada Resources Ltd - Various Projects

- Responsible for the project facility work, design, cost estimating drawings, bid, award, construction management and commissioning. Projects include:
  - Rimbey Terminal Flare Upgrade with Sump and Knockout Tank;
  - Block Valves Automation, Valley Pipeline;
  - Chevron Plant Meter Station Upgrade and Prover Addition;
  - Dow Plant Tie-In with C_3, C_4 and C_5 Meter Station and Prover Construction;
  - Rimbey Line Lowering (Exposed Creek Crossing);
  - Wabasca Main Line Booster Pump Station;
  - Rimbey Terminal above Ground Rack and Piping Relocation.

Gulf Canada Resources Ltd. - Various Projects

- Project Engineer/Manager responsible for linalog survey, verification digs, integrity and repair program for:
  - Fort Saskatchewan Pipeline;
  - Gulf Albert Pipeline;
  - Alberta Products Pipeline;
  - Rimbey Pipeline;
  - Wabasca River Pipeline.

Gulf Canada Resources Ltd. - Various Projects

- Senior Pipeline Engineer responsible for the feasibility, design and cost study for:
  - Clive Sweet Oil Flow Reversal to Rangeland;
  - West/East NGL, Edmonton;
  - Rimbey System Expansion Study;
  - AEC / Ogston Extension.

1990 – 1994 **Sr. Pipeline Engineer, Quantel Engineering Ltd., Calgary, AB Canada**

Pan Canadian Petroleum Ltd. - Rosemary Field Area Expansion

- Responsible for the design, cost estimating, specifications, drawings, construction bid document and construction assistance of the gathering systems for the Rosemary Field Area Expansion.

Komiarctic - Gulf – Russia

- Responsible for major river crossing design with line pipe specifications.

Amoco Canada Petroleum Ltd. - Various Projects

- Responsible for design, cost estimating, specifications, drawings, construction bid document and construction assistance of the gathering systems and facilities. Projects included:
  - Bear Lake Sour Gas Insulated Pipeline;
  - Wembley Sour Gas Insulated Pipeline;
  - Pine Creek Sour Gas Pipeline.

Alberta Energy Company - Hythe Plant Expansion

- Senior Pipeline Engineer responsible for sour gas line replacements in muskeg areas and tie-ins to the Hythe Plant Expansion Project.

Columbia gas - Kirby Lake Sour Gas Pipeline

- Senior Pipeline Engineer responsible for the design, cost estimating, specifications, drawings, construction bid document and construction assistance of gathering systems in muskeg areas.

1985 – 1990 **Field/Project Engineer, Koch Oil/Bow River Pipelines Ltd., Calgary, AB Canada**

Koch/Bow River Pipelines Limited - Various Projects

- Responsible for design, AFE, economics and construction including permits, bids, survey, inspection, cost estimating;
- Crossings and battery connections;
- Duties also included planning, coordination, implementation and interpretation of linalog surveys and specification integrity;
- Supervision of the resulting mainline repair project.
- Projects included:

  - Morrison/Renaissance Connection
  - Premier 6-24 Connection
  - Strathfield Connection
  - Morgan & LL-E Connection
  - Neutral Hills Connection
  - PanCan 5-5 Connection
  - Neutral Hills Extension
  - Ronalane Extension
  - 1990 Grand Forks Loop
  - Line Replacement
  - Pollockville
  - Mainline Repair
  - Canterra 10-06 Connection
  - Pension Fund Connection
  - Hays West Lateral
  - Amisk Lateral
  - Countess Lathom Line Lowering/relocation
  - Pollockville/Stanmore/Throne Loop Extension
  - Hardisty South Loop Extension
  - Altex 9-33 Connection
  - Morrison 4-3 Connection
  - Morrison 14-9 Connection
  - Tank Pad design & Construction
  - Dome LS 10-07 Connection
  - Eagle 15-15 connection
  - Grand Forks Loop Extension

- Futurity Connection
- Hays Loop Extension
- Etzikom Canal - Aerial Crossing Lowering
- Suncor 6-25 Connection

1983 – 1985 **Pipeline/Civil Engineer, Trans Montain Pipe Line Co. Ltd., Vancouver, BC Canada**

TransMountain Pipe Line Co. - Coquihalla Highway Project

- Responsible for design, supervision and inspection of various relocations and crossings of a large diameter pipeline.

Trans Mountain Pipe Line Co. Ltd. - Burnaby Terminal

- Civil Engineer responsible for the drafting of major contracts and specifications including design details and construction inspection of floating steel roof replacement of two 150,000 bbl crude storage tanks.

Trans Mountain Pipe Line Co. Ltd. - Test Procedures

- Civil Engineer responsible for hydrostatic line testing - designed test procedures;
- Identified pressure points and selected test site. Submitted required applications to the National Energy Board.

1980 – 1983 **District Engineer, Rangeland Pipe Line Co. Ltd., Olds, AB Canada**

Various Operations Projects

- Field Engineer responsible for the design, detailed cost analysis and build up for associated pipeline and facility projects.
- Responsibilities included line repair, surge relief, restoration of propane tank car loading terminal, design and construction supervision of a truck unloading crude oil terminal, construction supervision of lines, booster pump upgrading, back pressure valves, core storage buildings and oil spill recovery.

Field Operations – Olds

- Day to day operations assistance/support, integrity and maintenance/efficiency/capacity/costs improvements..

EDUCATION

B.Sc. Civil Engineering, University of Manitoba, 1979

Management Development Program, University of Calgary with APEGGA, 1988

REGISTRATIONS/AFFILIATIONS

Association of Professional Engineers, Geologists and Geophysicists of Alberta

Professional Engineers Association of British Columbia

Association of Professional Engineers, Geologists and Geophysicists of the Northwest Territories

WorleyParsons
resources & energy

R. (Russ) Young, P.Eng.
Materials Engineering Lead

Resume

SUMMARY

Over 30 years of experience in the pipeline industry including leadership/management activities as well as the provision of technical expertise in the areas of materials engineering and quality management. Significant leadership/management activities include recruitment, hiring and development of staff; development and management of department plans and budget.

Significant technical activities include development and management of company materials and component specifications; resolution of component manufacturing problems; failure and fitness for purpose assessments; implementation of new materials technology; participation on industry technical committees; development and implementation of vendor performance rating system; development and implementation of corporate quality management systems.

EXPERIENCE

2004 – Present **Materials Engineering Lead, WorleyParsons Calgary, Calgary, AB, Canada**

GASCO – Shah and Habshan Rail Project. Providing technical expertise regarding materials and component requirements for above grade liquid sulphur and buried gas pipelines.

TransCanada Pipelines – Alaska Pipeline Project (pre-FEED). Providing technical expertise regarding materials and component requirements for a large diameter, high pressure, arctic gas pipeline.

Enbridge Pipelines Inc. – Alberta Clipper. Providing technical expertise regarding materials and component requirements for a large diameter, oil pipeline. Also acting as the hydrostatic testing engineer.

Imperial Oil Resources – Mackenzie Gas Project. Provided technical expertise regarding materials and component requirements for a large diameter, high pressure, Arctic gas pipeline.

1999 – 2004 **Consultant, YKW Services Inc., Calgary, AB, Canada and Shelton, CT, USA**

Kinder-Morgan – Trans Mountain Expansion. Provided technical expertise regarding materials and component requirements for a large diameter, oil pipeline.

Inter Pipeline – Corridor Pipeline Expansion. Provided technical expertise regarding materials and component requirements for a large diameter, oil pipeline.

Iroquois Gas – Eastchester Extension Project. Provided project quality management for a subsea gas pipeline and related onshore facilities.

Enbridge Energy – Oman Pipeline. Investigation and root cause analysis on a number of large diameter ball valve seat seal failures.

Enbridge Pipelines Inc. – Vector Pipeline. Provided technical expertise regarding materials and component requirements for a large diameter, gas pipeline.

Alliance Pipeline – Alliance Project. Provided technical expertise regarding valve design, manufacture, commissioning, operation and maintenance.

1998 – 1999 **Manager (Valve Facility Integrity), TransCanada Transmission, Calgary, AB, Canada**

TransCanada Pipeline – various. Provided management to a team of experts with responsibility for all valve related assets within the TransCanada system.

1978 – 1998 **Various Positions, NOVA Gas Transmission, Calgary, AB, Canada and Ankara/Istanbul, Turkey**

Botas – Bulgaria-Ankara Gas Pipeline. Provided quality management for the project.

NOVA – Princess Compressor Station Rebuild. Provided materials engineering expertise to successfully complete the rebuilding on a $65MM gas pipeline compressor station destroyed by a pipeline rupture and subsequent fire.

NOVA – Princess Compressor Station Rebuild. Materials and equipment fitness for purpose assessments.

1976 – 1978 **Quality Control Supervisor, Western Canada Steel, Calgary, AB, Canada**

EDUCATION

B.A.Sc., Metallurgy & Materials Engineering, University of Toronto, 1976

REGISTRATIONS/AFFILIATIONS

Association of Professional Engineers, Geologists and Geophysicists of Alberta (APEGGA)

PUBLICATIONS/PRESENTATIONS

Line Pipe Properties From the Different Pipe Mills for the Alliance Pipeline Project, 2001

The Implementation of Grade 550 Pipe for Large Diameter Natural Gas Pipelines, 1995

Grade 550 Line Pipe Passes Tests for Canadian Project, 1991

SPECIFIC TECHNICAL EXPERTISE/SPECIALIST COURSES

Leadership Development Program

Elastomers Technology

Pipeline Reliability Conference

International Conference on Pipeline Reliability

Offshore Mechanics & Arctic Engineering Conference

Effective Skills for the Technical Manager

Interpersonal Skills Development

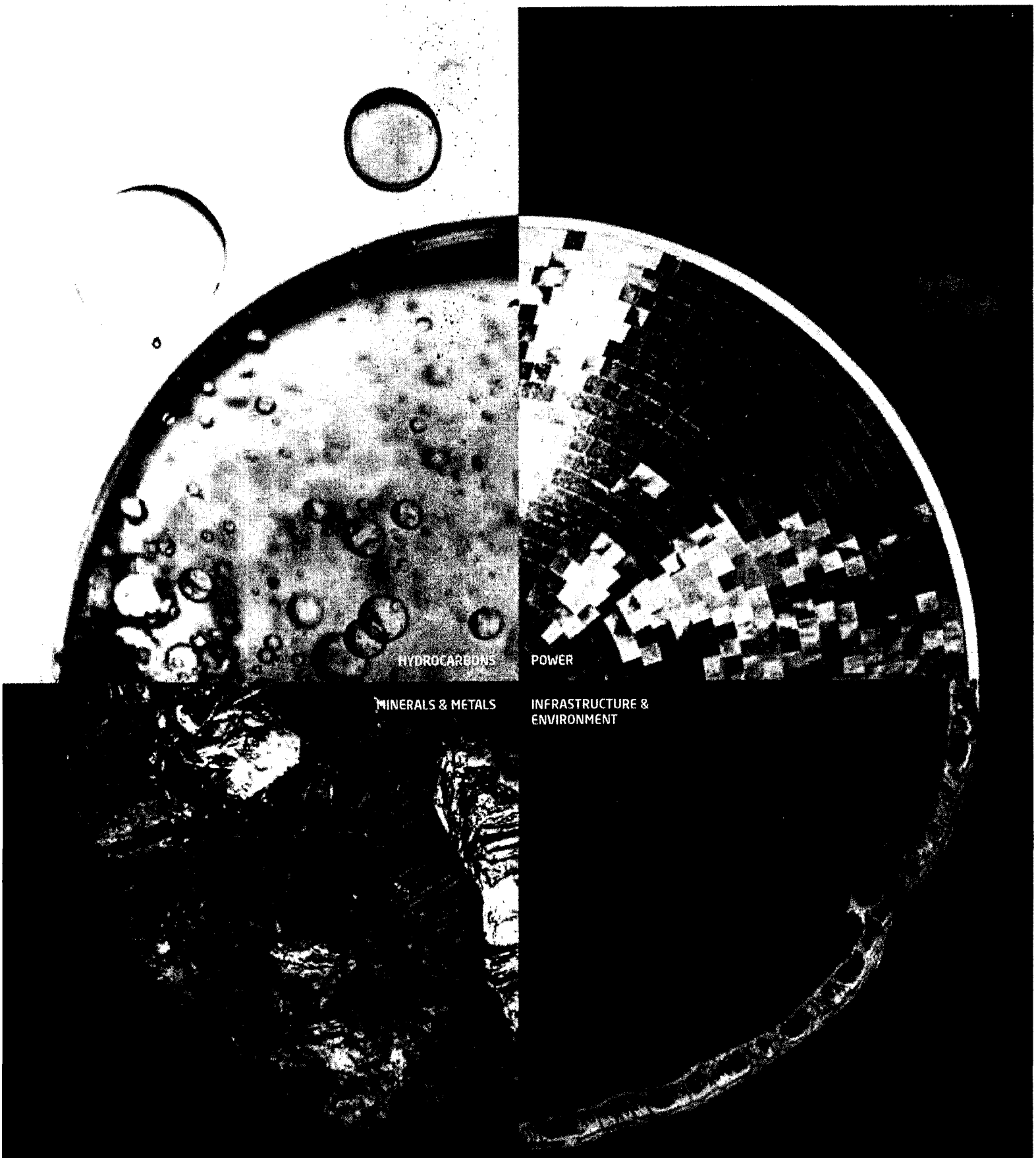
Current Solutions to Hydrogen Problems in Steel

WorleyParsons
resources & energy

EcoNomics

Global Pipeline Systems

Capability & Experience


HYDROCARBONS
POWER
MINERALS & METALS
INFRASTRUCTURE &
ENVIRONMENT

Corporate Overview

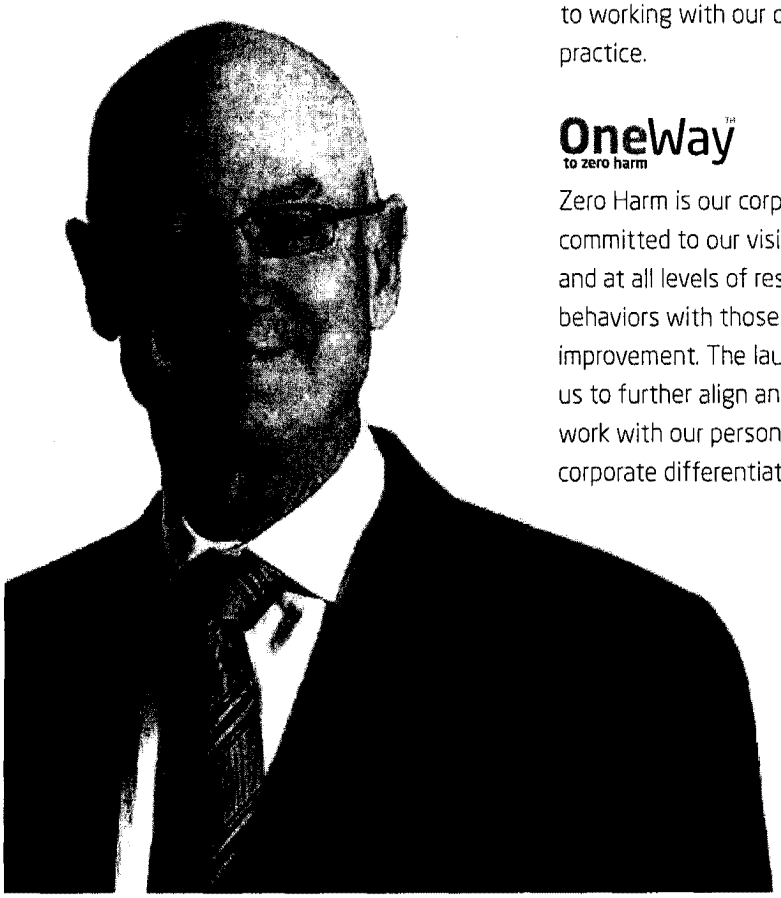
WorleyParsons is a leading global provider of professional services to the resources and energy sectors, and the complex process industries.

We cover the full asset spectrum, both in size and life cycle—from the creation of new assets to services that sustain and enhance operating assets.

Our business has been built by working closely with our customers through long-term relationships, anticipating their needs, and delivering inventive solutions through streamlined, proprietary project delivery systems. Strong growth continues to characterize our performance both through organic development and through strategic acquisition, as we strive to provide tailored services wherever our customers need us.

EcoNomics™

EcoNomics™ is our range of services and technologies that profitably embed environmental, social and financial sustainability into project delivery across the asset lifecycle. It is a seamless extension of our established project delivery capability in the key areas of assessment, efficiency, and treatment and mitigation. We are committed to working with our customers to turn their sustainability objectives into good business practice.

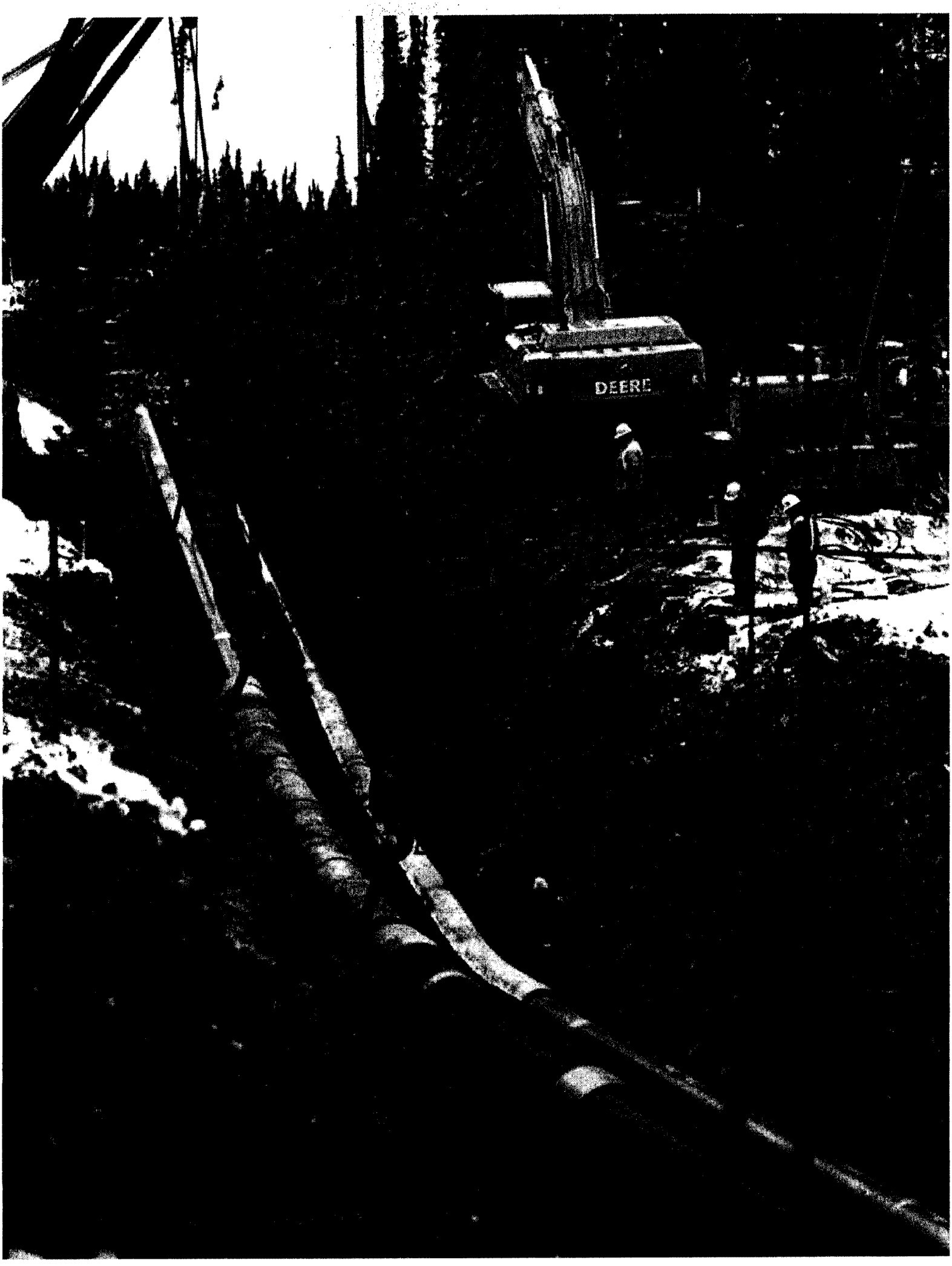


OneWay™
to zero harm

Zero Harm is our corporate vision for health, safety and the environment (HSE). We are committed to our vision; it applies to all of our operations, at all times, in all locations, and at all levels of responsibility. We will actively work to align our expectations and behaviors with those required to achieve our vision through a dedication to continuous improvement. The launch of our integrity management framework, OneWay™, enables us to further align and consolidate our global systems and procedures and continue to work with our personnel to reinforce a culture that underpins our drive to achieve our corporate differentiator of industry leadership in HSE performance.

There is no task so important or so urgent in our business, or our customers' businesses, that it overrides the need to work safely.

John Grill WorleyParsons CEO


DEERE

Pipeline Systems Capability

From large-diameter, long-distance transmission pipeline systems to small-inch gathering and distribution systems, WorleyParsons has designed and managed the construction of more than 100,000 km of pipeline, pipeline-related facilities, and terminals globally.

As the largest onshore pipeline engineering and project delivery provider, we have committed major resources and effort to create and maintain pipeline systems capabilities to assist our customers in reaching their company and project objectives.

100,000+
Kilometers of onshore pipeline systems installed

With more than 1,000 pipeline specialists and multi-discipline personnel, WorleyParsons has the expertise and capability to work with our customers to develop projects, undertake all phases and levels of studies, provide expert input to solve problems, and to deliver multibillion-dollar projects.

WorleyParsons provides a full range of engineering, procurement, and construction management (EPCM) services to our customers, covering all facets of pipelines and related facilities. Our success in delivering cost-effective EPCM solutions is a result of our continuous investment in new generation technologies that serve the pipeline industry and the ongoing education and training of our personnel.

1,000+
Pipeline specialists

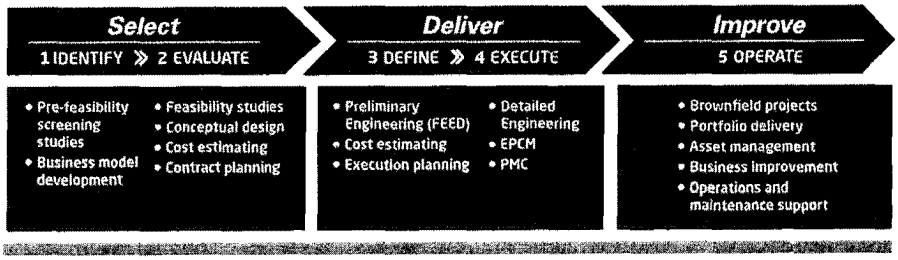
WorleyParsons provides total solutions to the pipeline industry. In providing these solutions, our customers can be assured that:

- All available options are considered
- The solution that is chosen will support the ultimate business objective
- Solutions are managed with responsibility and accountability
- A clear focus is maintained on critical issues such as HSE, budget, schedule, quality, and technical integrity.

WorleyParsons Project Phases

WorleyParsons' experience covers all five phases of the asset lifecycle. In each one of these phases we understand the critical issues and apply our specialist business lines, *Select*, *Deliver* and *Improve* to enable our customers to achieve their business objectives.

Our phased approach enables consistent project delivery worldwide and WorleyParsons' project systems are fully aligned to this process.



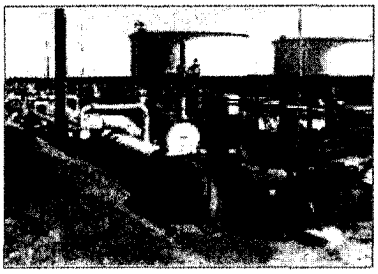
EcoNomics

WorleyParsons
resources & energy

Capability Overview

Mainline and Gathering Systems page 8

WorleyParsons has designed every type of pipeline system in use worldwide. Our customers include pipeline transportation companies, oil and gas producers, petrochemical companies, refineries, and rural gas cooperatives. We have provided innovative EPCM engineering services to design and construct single and multi-phase pipeline systems for the gathering, transportation and distribution of heavy and light oil, petroleum products, liquid sulphur, slurries, natural gas, water, gases, and bitumen. We are experienced in contract management, specifications, and construction techniques for all types of steel, plastic and composite pipe systems.



Pipeline Terminals page 10

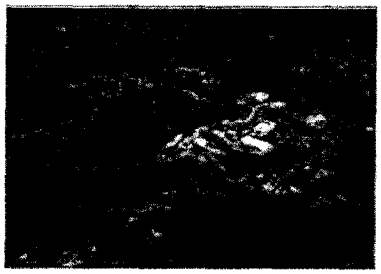
WorleyParsons has a long and successful history of providing a full range of project services for pipeline terminal design and construction to major pipeline operators and smaller transportation companies alike. We can undertake all types of pipeline terminal projects, including studies and investigations, large capital projects, expansions, revamps, major grassroots installations, and sustainable maintenance work. Our experience includes pipeline initiating and receiving terminals, storage tanks, tank farms, and batching and blending facilities.

Pump Stations and Compression Facilities page 14

WorleyParsons' multidisciplinary pipeline facilities specialists provide a full range of engineering services from conceptual studies to detailed design of pipelines and compression facilities. We can provide project scoping and costing, regulatory applications, preliminary and detailed engineering, procurement, and construction management. Individual projects have ranged from small studies or investigations, to major, multi-station installations, and both grassroot and revamp projects.

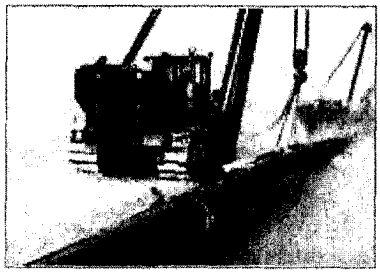
Pipeline and Asset Integrity page 18

WorleyParsons' pipeline integrity group is a key component of the global pipeline systems capability, specializing in project management, engineering, design and integrity analysis of pipelines, pipeline systems, and related facilities. Our full-service approach allows pipeline integrity to be developed and implemented in the design, or at any point in the operational life of pipelines and related facilities. For new pipelines and infrastructure, integrity begins at the project conception stage and allows for risk mitigation and long-term optimized performance to be built into the final design.



Geomatics page 20

Specializing in geographic information systems (GIS) analysis, spatial data management, automated alignment sheet generation, 3D visualization and remote sensing applications, WorleyParsons is on the leading edge of the data-centric application of geomatics to pipeline and other linear engineering and environmental projects. Our Geomatics team provides support to projects and assets requiring inception-to-closeout data management, ensuring that data have integrity, security, and an effective change management process. As subject matter experts in the geomatics industry, WorleyParsons can offer the full suite of geomatics services, whether it be simple base mapping or enterprise-wide data management solutions.

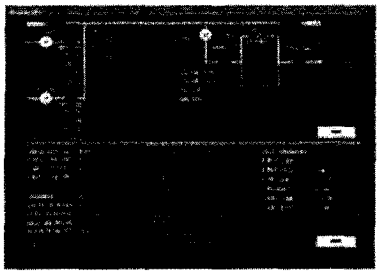


Arctic Experience page 22

More than 30 years of experience has taught WorleyParsons how to deal with construction related to permafrost and the design of pipelines and facilities that must operate at -50°C. We have established strong working relationships with fabricators, contractors, transportation companies, suppliers, and indigenous groups in Northern Canada. We offer arctic pipeline and facilities design capabilities including the most recent state-of-the-practice design using strain-based techniques, remote logistics knowledge, permafrost treatment, and northern operational considerations.

Offshore Pipelines and Subsea Systems page 24

INTECSEA Engineering is a diverse and highly qualified company with a history of delivering innovative engineering and project management solutions to customers worldwide. INTECSEA incorporates all the capabilities within INTEC, WorleyParsons Sea, and the WorleyParsons floating systems, offshore pipelines, and subsea teams. INTECSEA allows us to offer customers a full service solution in a range of specialty areas, including subsea production, offshore pipelines, marine production risers, flow assurance, and floating production systems, including all types of deepwater hulls and mooring systems.



Leak Detection page 30

WorleyParsons' LINEGUARD is a field-proven, innovative approach to modeling the transient behavior of liquid pipelines. LINEGUARD provides accurate, robust, model-assisted, material-balance leak surveillance 24/7 and can reveal the location of the leak.

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Mainline and Gathering Systems

WorleyParsons has designed every type of pipeline system in use worldwide. Our customers include pipeline transportation companies, oil and gas producers, petrochemical companies, refineries, and rural gas co-ops.

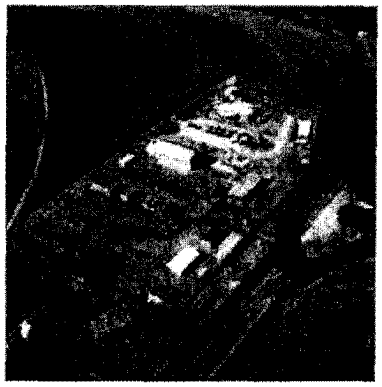
We have provided innovative EPCM engineering services for the design and construction of single- and multi-phase pipeline systems for gathering, transportation, and distribution of heavy and light oil, petroleum products, liquid sulfur, slurries, natural gas, water, gases, and bitumen. We are experienced in contracts, specifications, and construction techniques for all types of steel, plastic, and composite pipe systems. Our pipeline experience extends through technically challenging, environmentally sensitive areas, and difficult terrain including arctic, permafrost and muskeg, steep rocky mountains, deserts, jungles, and swamps. WorleyParsons can assist customers with any phase of a pipeline project, from project conception through to commissioning and startup. Our capabilities include:

Systems operating up to
6,000 psi

Designed for temperatures up to
300°C

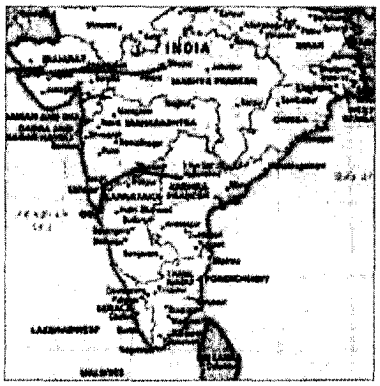
US$80B+
CAPEX value of pipeline projects

- pipeline route reconnaissance, assessment, and selection
- environmental Impact Assessments (EIA), Environmental Field Report (EFR) preparation and submission of regulatory filings, permitting, stakeholder consultation, and support services
- project execution and management planning centered on industry best practices such as lifecycle value assessment, project risk management and mitigation planning, value engineering, incorporation of safety in design, and lessons-learned programs
- pipeline hydraulics, transient and steady-state analysis, and station location evaluations leading to optimal pipeline sizing and facility design, using single-phase and multi-phase computer design methods
- design utilizing limit states and strain-based design for above-ground and buried installation, high-temperature requirements, composite materials, and multiple and complex systems
- pipeline designs for river and lake crossings using trenchless installation technology, including Horizontal Directional Drilling, conventional and directional boring and pipeline tunnelling, as well as bridge supports over valleys and canyons
- integrated design of operational requirements such as cleaning operations, pipeline integrity, and corrosion prevention programs using anodic and cathodic methods.



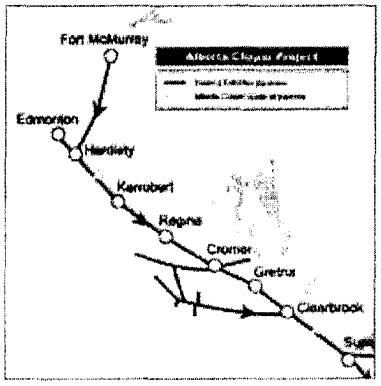
Project **NMPP Multiproducts Pipeline .**
Customer Transnet
Project Location South Africa
Phases IDENTIFY EVALUATE DEFINE EXECUTE OPERATE

WorleyParsons, as part of the NMPP Alliance joint venture, provided FEED and full EPCM to complete the first phase of the project by 2010. Included is a 550 km, 24". multi-products pipeline from a coastal terminal at Durban to an inland terminal at Jameson Park near Johannesburg Gauteng. In addition, there are 160 km of 16" pipelines transporting the products around Gauteng region. The pipelines transport 95- and 93-grade petrol, low-sulphur and ultra-low-sulphur diesel and aviation spirit. The coastal terminal consists of 12 tanks totaling 188,000 m^3 for the 2010 operation, increasing to 16 totalling 338,000 m^3 by 2020. The inland terminal has 24 tanks totalling 380,00m^3 by 2020. The main 24" trunkline has three electric-driven pump stations increasing to eight by 2020.



Project **Jamnagar to Bhopal & Goa to Hyderabad Pipelines**
Customer Reliance Petroleum
Project Location India
Phases IDENTIFY EVALUATE DEFINE EXECUTE OPERATE

This greenfield project involved the development of two multi-product pipelines and seven pumping stations in India, one across the north connecting Jamnagar to Bhopal (805 km length) and one to the south connecting Goa to Hyderabad (697 km) that dealt with very complex route selection issues due to a major escarpment inland from Goa. WorleyParsons (in a joint venture) was responsible for EPCM of the pipeline and associated facilities. This project was executed in a fast-tracked manner satisfying the customer's needs to rapidly establish distribution networks within India. Basic engineering design was carried out in WorleyParsons' Perth office with detailed engineering completed by the joint venture partner in India.



Project **Alberta Clipper Expansion Pipeline**
Customer Enbridge Pipelines Inc.
Project Location Canada
Phases IDENTIFY EVALUATE DEFINE EXECUTE OPERATE

The Alberta Clipper project consists of a new crude oil pipeline from Hardisty, Alberta to Superior, Wisconsin to increase capacity of the Enbridge system by 450,000 barrels per day (bpd) and later be expandable to 800,000 bpd. Project responsibilities in the first stage included conceptual engineering/ pre-FEED, FEED studies for the Canadian portion, a review of the pre-FEED engineering and estimate for the U.S. portion of the pipeline system, regulatory and commercial support, detailed engineering, and field construction support for the 1,070 km - 36" Canadian section. As of mid-2010, the completed pipeline is in the process of linefill and commissioning.

Project **PNG Gas**
Customer Esso Highlands Limited
Project Location Papua New Guinea .
Phases IDENTIFY EVALUATE DEFINE EXECUTE OPERATE

The Papua New Guinea (PNG) Gas project involves tapping vast quantities of natural gas in PNG's Southern Highlands and transporting the gas over 3,000 km via pipelines to customers in Australia. WorleyParsons, through the EoS joint venture, is executing front-end engineering design (FEED) for the gas project. The activities in the FEED program include design of a gathering system encompassing more than 500 km of gas, liquid, and multiphase pipelines, new 600 MSCFD gas processing and export compression facilities, infrastructure, and the PNG section of the gas pipeline from the Southern Highlands to Australian landfall at Cape York.

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Pipeline Terminals

WorleyParsons' pipeline facilities group has more than 30 years experience in conceptual and detailed design of tanks and terminals. Our experience includes every phase of project execution, from conceptual and preliminary engineering to detailed design, procurement and construction management.

20M+ bbl
of total storage tank volume

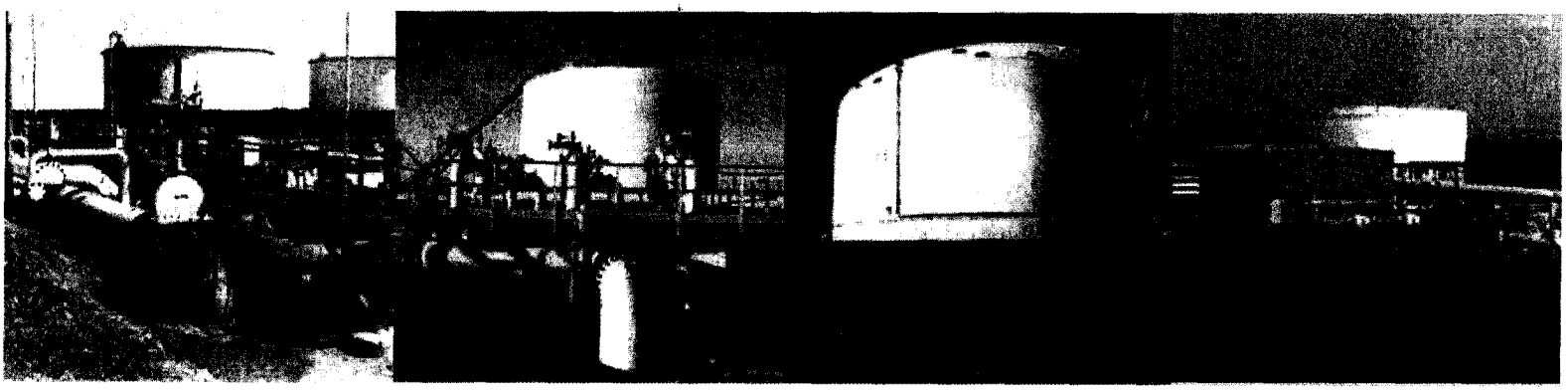
Tank sizes up to
500K bbls

5,000+
Horsepower unit initiating stations

The WorleyParsons pipeline facilities group has a large global resource base dedicated to pipeline terminals. We are involved in a variety of projects including grassroots pipeline initiating and receiving terminals, as well as tank farm expansions and revamp/ sustainable project work. WorleyParsons assists its customers in obtaining regulatory approval for greenfield tank construction, as well as additions to existing tank lots.

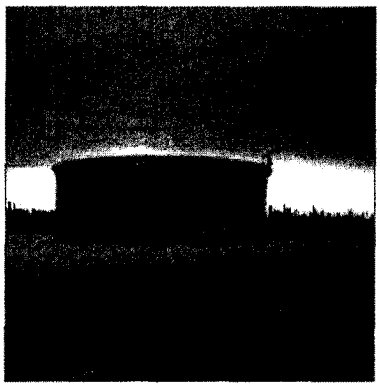
Our specific areas of technical expertise include:

- initiating and receiving terminals
- storage tanks and manifold systems
- above and below-grade storage tanks and vessels
- booster and blending pumps
- custody transfer and metering systems
- loading / unloading facilities, including truck, rail and ocean vessel
- pipeline tie-ins
- remote and local control and communication systems
- tank protection and restoration
- fire protection
- site development—foundations, roads, and containment systems.



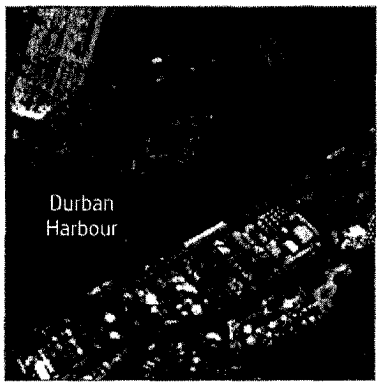
Project **Athabasca Expansion**
Customer Enbridge Pipelines Inc.
Project Location Alberta, Canada
Phases IDENTIFY EVALUATE DEFINE EXECUTE OPERATE

The Athabasca Expansion project included front-end and detailed engineering services, procurement, construction management support, and metering facilities. This project involved the following: 1) Cheecham receipt terminal to receive product from the Surmont blending facility, including blend storage, diluent storage, custody transfer metering, pumps, and associated controls, instrumentation, electrical distribution, and equipment; 2) Cheecham Terminal to receive product from the Long Lake facility, consisting of a 180K bbl tank, and a 120K bbl tank (for diluent or PSC service), site retention pond, custody transfer metering and prover, booster and mainline pumps, electrical services building, and associated controls, instrumentation, communication, electrical distribution, and equipment; 3) Allowance for future expansion at Cheecham terminal, to accommodate six tanks varying in size from 120K to 180K bbl.



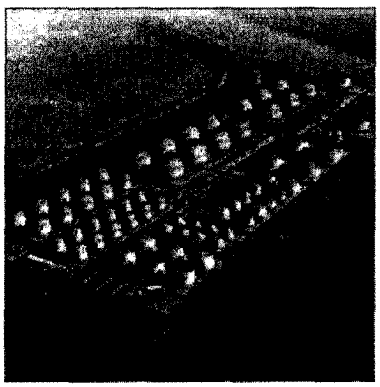
Project **Woodland**
Customer Enbridge Pipelines Inc.
Project Location Alberta, Canada
Phases IDENTIFY EVALUATE DEFINE EXECUTE OPERATE

WorleyParsons completed a design basis memorandum (including a Class III capital cost estimate) and is currently executing detail design for the $200M facilities for the Enbridge Woodland project, which is the oil delivery system for the Imperial Oil Limited Kearl Lake project. The scope of work includes a new initiating station with two 2,500 hp pump units, two new 300,000 bbl breakout tanks at the existing Enbridge Cheecham terminal, new booster and transfer pumps for the new tankage, and custody transfer metering at the Cheecham terminal. The site development involved a significant amount of civil work because of the unsuitability of the native material on site.



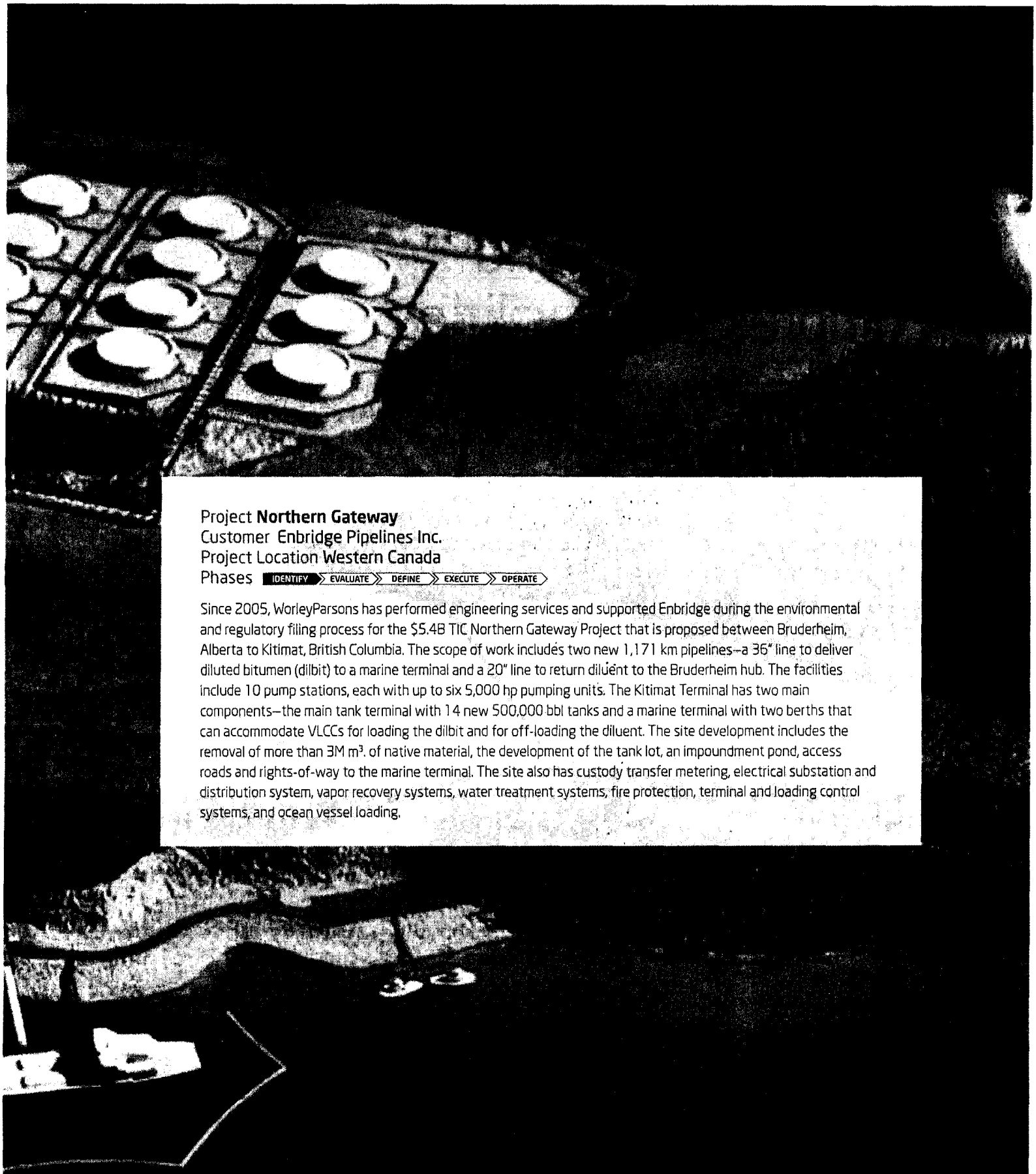
Project **Chevron Products Company (CVX)**
Customer Chevron
Project Location Durban, South Africa
Phases IDENTIFY EVALUATE DEFINE EXECUTE OPERATE

Chevron Products Company intends to construct a fuels terminal in Durban, South Africa for storage of motor gasoline and diesel fuels with piping tie-ins to tanker berths as well as existing terminals and pipelines. The terminal is to be constructed on an existing site currently occupied by an operational Lube manufacturing plant. WorleyParsons Houston, with assistance from WorleyParsons South Africa, has been selected to provide CPDEP Phase 2 Engineering Services for this project.



Project **Universal Terminal - Crude & Petroleum Storage and Related Facilities**
Customer Hin Leong Trading
Project Location Singapore
Phases IDENTIFY EVALUATE DEFINE EXECUTE OPERATE

WorleyParsons was Owner's Engineer for the FEED, detailed design, and management of the EPC contractors for the largest single-stage greenfield terminal in the Asia-Pacific region, at 2.3 M m^3 of storage. As a single-stage construction project, it is arguably one of the biggest terminal projects ever undertaken globally. The terminal will house 73 storage tanks with sizes ranging from 2,000 m^3 to 100,000 m^3 for crude and petroleum products. Providing storage for a variety of petroleum products (crude, fuel oil, diesel, jet fuel, petrol and naphtha) and 12 berths, including two for very large crude carriers, the facility is designed to provide fast turnaround in the loading and unloading of cargo using dedicated tanks, pumps, and pipelines to avoid contamination.



Project **Northern Gateway**
Customer **Enbridge Pipelines Inc.**
Project Location **Western Canada**
Phases **IDENTIFY** EVALUATE DEFINE EXECUTE OPERATE

Since 2005, WorleyParsons has performed engineering services and supported Enbridge during the environmental and regulatory filing process for the $5.4B TIC Northern Gateway Project that is proposed between Bruderheim, Alberta to Kitimat, British Columbia. The scope of work includes two new 1,171 km pipelines–a 36" line to deliver diluted bitumen (dilbit) to a marine terminal and a 20" line to return diluent to the Bruderheim hub. The facilities include 10 pump stations, each with up to six 5,000 hp pumping units. The Kitimat Terminal has two main components–the main tank terminal with 14 new 500,000 bbl tanks and a marine terminal with two berths that can accommodate VLCCs for loading the dilbit and for off-loading the diluent. The site development includes the removal of more than 3M m^3. of native material, the development of the tank lot, an impoundment pond, access roads and rights-of-way to the marine terminal. The site also has custody transfer metering, electrical substation and distribution system, vapor recovery systems, water treatment systems, fire protection, terminal and loading control systems, and ocean vessel loading.

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Pump Stations and Compression Facilities

WorleyParsons' multi-disciplinary pipeline facility specialists provide a full range of engineering services from conceptual studies to detailed design of pump stations and compression facilities.

5,000+
Horsepower unit initiating stations

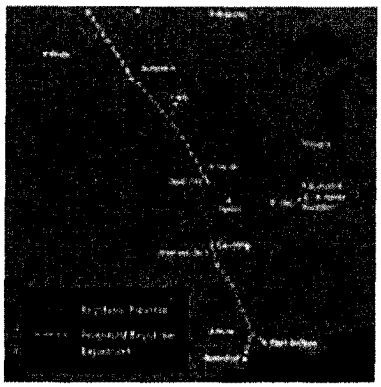
30+
Years of pump station design experience

1.2M
Combined horsepower of mainline gas compression

Our recent and historical experience in the project management and design of pump and compressor stations is unparalleled. We have provided project scoping and costing, regulatory applications, preliminary and detailed engineering, procurement, and construction management. Individual projects have ranged from small studies or investigations, to major, multi-station installations, both grassroots and revamps.

Recent major projects have facilitated the development of a "template" pump station design, which can be customized to acknowledge site-specific needs. This prototype design allows for significant reductions in engineering effort as well as capital cost, by exploiting the economies of scale associated with major equipment purchases and reduced maintenance and operating costs. On one project, the design was incorporated in more than 17 grassroot pump stations during a three-year period. Additional work, as part of the same capacity expansion program, involved upgrades to more than 19 sites along the pipeline route. Project services offered by the pipeline facilities group include:

- mainline pump stations with units up to 5,000 hp with variable frequency drives and harmonic filters
- compressor stations with large-frame, gas turbine-driven, centrifugal compressor packages rated for up to 26 MW per unit
- station pig traps—launching and receiving
- utility and station electrical substations, electrical distribution, and electrical systems
- station revamps, including unit replacement and/or unit addition
- site development—including foundations, roads, buildings, containment systems
- remote and local control and communication systems
- fire protection
- pressure regulating and custody transfer metering stations.

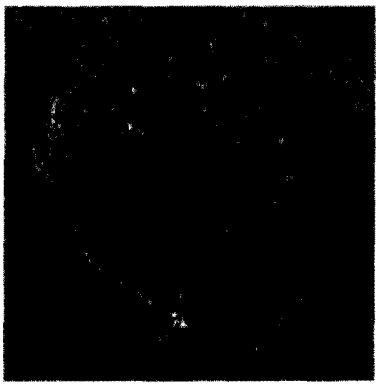


Project **Keystone Facilities Phases 3 & 4**
Customer TransCanada Pipelines Limited
Project Location Canada and the United States
Phases IDENTIFY EVALUATE DEFINE EXECUTE OPERATE

Responsibilities included the greenfield design of $1.4B+ worth of facilities for phases 3 & 4 of the TransCanada Keystone Project from Hardisty, Alberta, to Houston, Texas. The scope included the detailed engineering design of 38 pump stations with up to 7,000 hp units each, using a "templated" design to meet customer cost and schedule demands. The project included two new terminals each with three 350,000 bbl tanks, 61 new remote block valve sites along the 3,000+ km pipeline, new metering at third terminal in Texas, and reliability and maintainability study for both of the mainline Keystone pipelines. WorleyParsons also performed the geotechnical data collection and site survey for the pump station sites and assisted with the construction engineering support for phases 1 & 2.

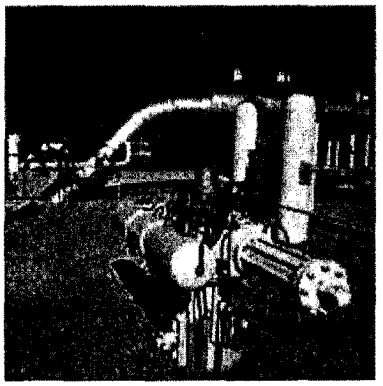
Project **Southern Access Line 4 Expansion**
Customer Enbridge Pipelines Inc.
Project Location Canada & USA
Phases IDENTIFY EVALUATE DEFINE EXECUTE OPERATE

Responsibilities included the preliminary engineering and detailed design on Phases 1, 2A and 2B of the $300M upgrade to Enbridge's Line 4 existing pipeline facilities from Hardisty, Alberta to Superior, Wisconsin. Project involved modifying the 25 pump stations and 5 terminals, both in Canada and the U.S., to increase the design capacity of Line 4 to approximately 1,000K bpd of heavy crude. Mainline pump station upgrades included pump modifications/replacements as well as associated electrical power upgrades, discharge pressure control valve replacements, and piping upgrades. Terminal upgrades included additional booster pumps, meters, and associated piping, foundations, electrical, and instrumentation.



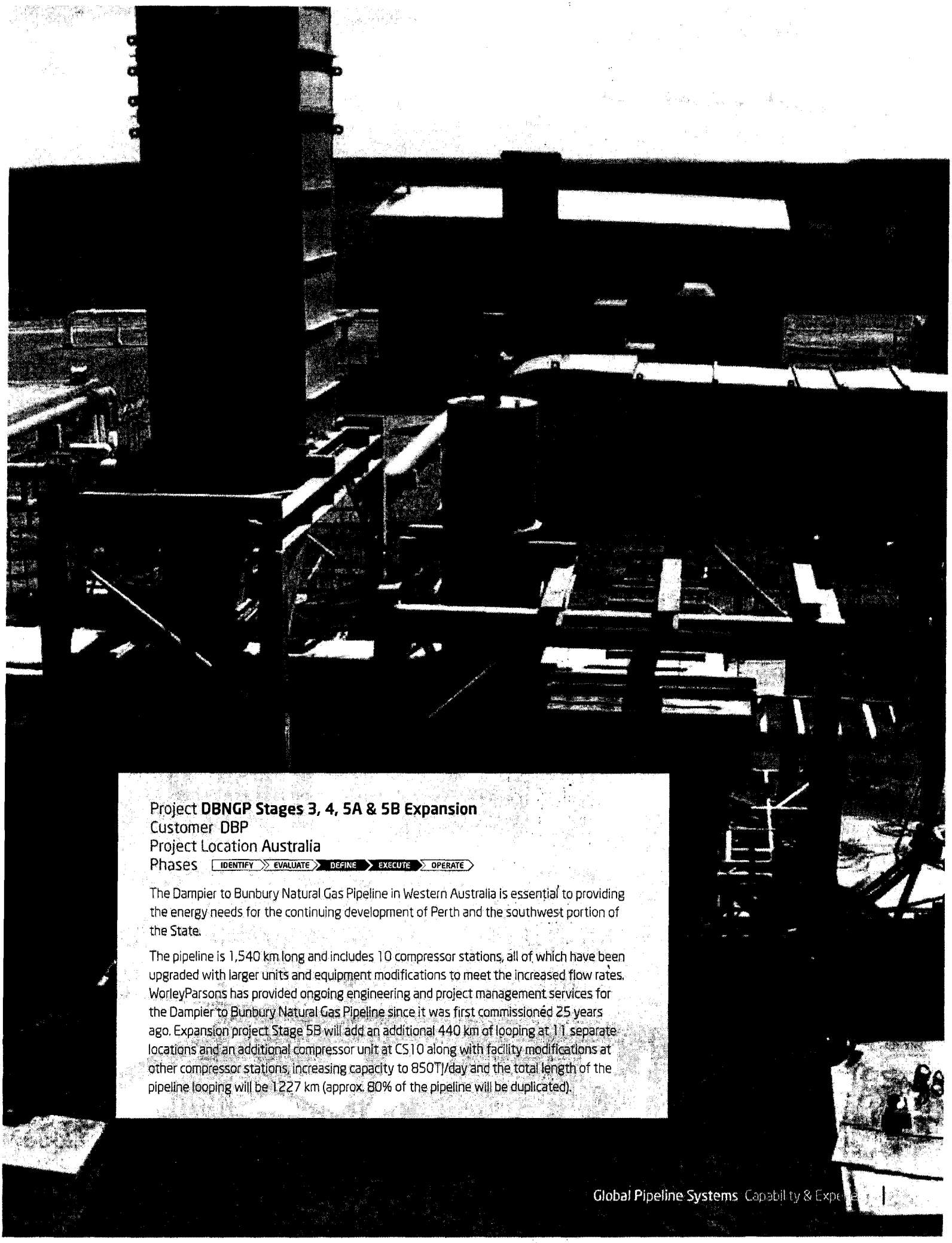
Project **Compressor Expansion**
Customer Gas TransBoliviano (GTB)
Project Location South America
Phases IDENTIFY EVALUATE DEFINE EXECUTE OPERATE

WorleyParsons was involved with the design, procurement, and commissioning of four compressor stations located in Bolivia, for GasTransBoliviano SA. The expansion project was designed to increase the capacity of the BBPL from 10.3 MMCMD to a contracted 32.0 MMCMD. This was achieved through upgrading an existing station, Yacuses, and constructing three new compressor stations: Chiquitos, Izozog and Robore. The stations were constructed in the Bolivian jungle, west of the city of Santa Cruz.



Project **Waupisoo Pipeline**
Customer Enbridge Pipelines Inc.
Project Location Canada
Phases IDENTIFY EVALUATE DEFINE EXECUTE OPERATE

WorleyParsons provided preliminary and detailed engineering of facilities for a new pipeline that delivers diluted bitumen from Cheecham to Edmonton. The new Waupisoo Pipeline required the installation of additional terminal facilities at Cheecham terminal, a midpoint pump station, and facilities at the Edmonton terminal. Waupisoo facilities at Cheecham included the addition of a 150,000 bbl tank, a two-unit 5,000 hp pump station, booster pump, and metering. Other work involved a new two-unit 5,000 hp mainline pump station at midpoint near Lac La Biche and automation work at mainline valve sites along the pipeline route. Edmonton terminal work included the installation of two densitometer panels, a pressure control station and a connection to Pipeline Alley for Kinder Morgan.



Project **DBNGP Stages 3, 4, 5A & 5B Expansion**
Customer DBP
Project Location Australia
Phases IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

The Dampier to Bunbury Natural Gas Pipeline in Western Australia is essential to providing the energy needs for the continuing development of Perth and the southwest portion of the State.

The pipeline is 1,540 km long and includes 10 compressor stations, all of which have been upgraded with larger units and equipment modifications to meet the increased flow rates. WorleyParsons has provided ongoing engineering and project management services for the Dampier to Bunbury Natural Gas Pipeline since it was first commissioned 25 years ago. Expansion project Stage 5B will add an additional 440 km of looping at 11 separate locations and an additional compressor unit at CS10 along with facility modifications at other compressor stations, increasing capacity to 850TJ/day and the total length of the pipeline looping will be 1227 km (approx. 80% of the pipeline will be duplicated).

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Pipeline and Asset Integrity

The WorleyParsons pipeline integrity group is a key component of the global pipeline systems capability, specializing in project management, engineering, design, and integrity analysis of pipelines, pipeline systems, and related facilities.

50+
Integrity specialists

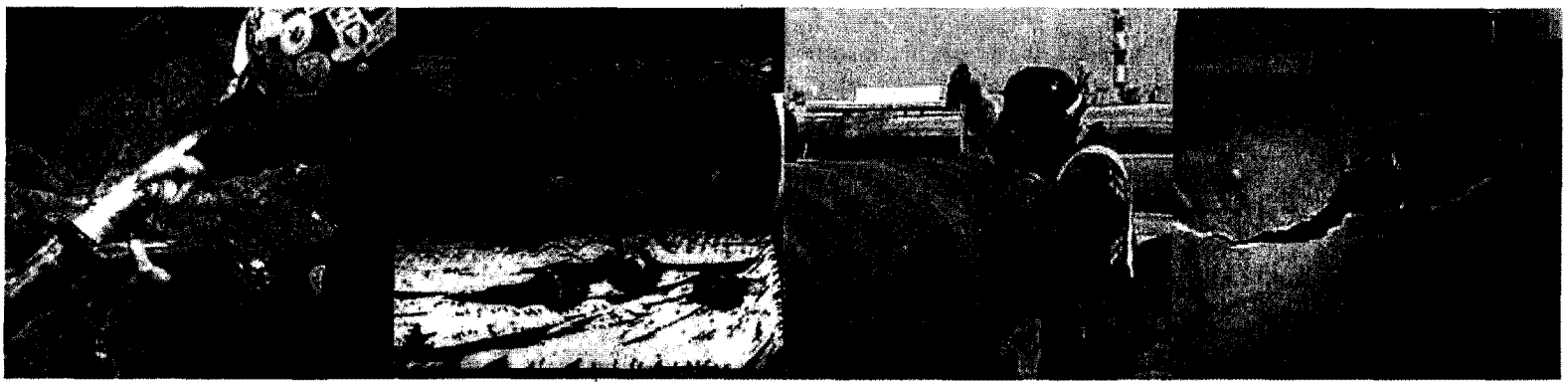
300+
Projects annually

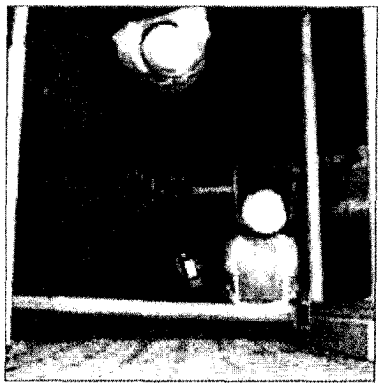
7
Offices

Our full-service approach allows pipeline integrity to be developed and implemented in the design, or at any point in the operational life of pipelines and related facilities. For new pipelines and infrastructure, integrity begins at the project conception stage and allows for risk mitigation and long-term optimized performance to be built into the final design.

For existing pipelines and related infrastructure, we offer assessment, monitoring, repair-priority ranking, and the development of long-term integrity management programs addressing due diligence needs, regulatory compliance, and sustained program implementation. Our in-house integrity specialists can supplement our customers' existing pipeline integrity skill sets and teams, or develop and implement a turnkey program from conception to completion.

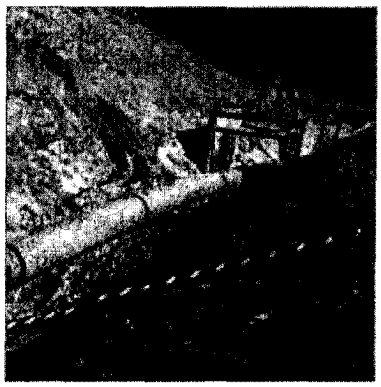
Our integrity group is comprised of engineers and technologist who possess a wide range of skill sets. Some of the group have supplemented their formal education through outside training and have been certified by NACE International as CP Specialists, CP Technologists, CP Technicians, Protective Coating Specialists, Internal Corrosion Technologists, Senior Corrosion Technologists and Corrosion Technologists.





Project **BP LA Basin Pipelines**
Customer BP Pipelines (North America)
Project Location United States
Phases IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

This BP Pipelines District provides a connection for tankers offloading crude and other products to local refineries. More than 193 km of active pipelines move approximately 1,000,000 bpd of refined products and crude oil throughout the Los Angeles area. The LA Basin Pipeline Systems consists of approximately 65 pipeline segments, with some pipelines being more than 80 years old. The terms of reference for the work were to identify corrosion modes, corrosion protection methods, and pipeline inspection methods relevant to pipeline integrity, as well as recommendations for effective corrosion and integrity management systems for pipelines.

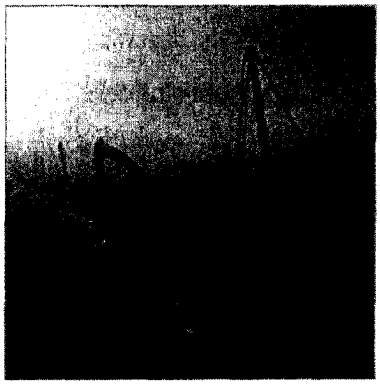


Project **Due Diligence**
Customer Confidential
Project Location Canada
Phases IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

WorleyParsons performed a technical evaluation of assets of a pipeline operator for valuation purposes. The pipeline operator deals with several thousand kilometers of pipelines and associated facilities. The pipelines have operating for more than 50 years. WorleyParsons provided engineering due diligence related to the integrity of the existing pipeline infrastructure, reviewed the pipeline integrity management processes and related technical support, and commented on the proposed operating and maintenance costs of the pipeline systems.

Project **Bayonne Energy**
Customer Pure Technologies LLC
Project Location United States
Phases IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

Evaluation of the feasibility of converting an existing inactive fuel oil pipeline to transport either natural gas or water. As the most stringent requirements were related to gas service, the review and comments contained in the report dealt exclusively with using the pipeline for transporting natural gas. The report was based on an assessment of the pipeline in-line inspection report and included recommendations on the feasibility of utilizing the pipeline for natural gas transmission. Recommendations for remediation of the pipeline were included in the final report.



Project **Mackenzie Gas Pipeline**
Customer Imperial Oil Resources Ventures Limited
Project Location Canada
Phases IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

Cathodic protection (CP) and coating design for the proposed 1,221 km, 30" diameter gas pipeline and the 470 km, 12.75" NGL pipeline in the Northwest Territories. The CP work included dealing with the telluric current effects along the route. The coating work required evaluation of coating systems to determine their suitability in extreme arctic conditions and qualification testing for backfilling damage, electrical stresses, transportation durability, performance properties, bending, and repairs. The work required the development of specifications for CP materials and installation and for field- and plant- applied coating systems.

WorleyParsons

resources & energy

Geomatics

Specializing in geographic information systems (GIS) analysis, spatial data management, automated alignment sheet generation, 3D visualization and remote sensing applications, WorleyParsons is on the leading-edge of the data-centric application of geomatics to pipeline and other linear engineering and environmental projects.

100+

Geomatics specialists

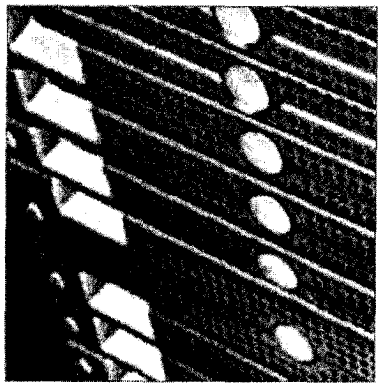
30,000+

Kilometers of pipeline supported

Our Geomatics team supports projects and assets requiring inception-to-closeout data management, ensuring that data have integrity, security, and an effective change management process. In line with WorleyParsons' commitment to EPCM support, our specialists possess the versatility and depth to: serve as the sole supplier; work as a subcontractor; or subcontract base services locally. As subject matter experts in the Geomatics industry, WorleyParsons offers the full suite of Geomatic services whether it be simple base mapping or enterprise-wide data management solutions.

Working as part of an engineering and environmental team on WorleyParsons projects or as a program manager for Geomatics projects, WorleyParsons Geomatics services include:

- spatial data management
- Geomatics standards development
- automated alignment sheet generation
- GIS analysis
- aerial and satellite acquisition, management, and processing
- LiDAR acquisition and analysis
- cartography and web mapping
- data conversion and migration
- public consultation support
- facility and route selection
- mine monitoring and modeling
- support to field programs
- GPS field kit program
- 3D visualization
- terrain modeling
- engineering modeling and simulation
- facility management support
- 3D laser scanning
- RFID integration
- integrity and operation support
- spatial application development and integration
- web portal development and hosting
- logistics planning support
- training and education.



Project **Major Arctic Pipeline**
Customer Confidential
Project Location Canada
Phases IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

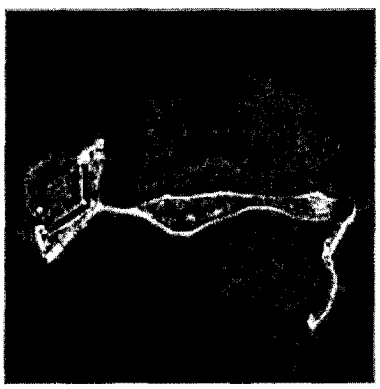
A greenfield natural gas pipeline with laterals required a centralized data environment that contained all project data, and that could ensure data integrity, commonality, and rigorous change management. WorleyParsons Geomatics provided data management services encompassing actual loading, quality control, versioning, editing, visualizing, and deployment. We provided project-wide access across many companies and cities was provided while ensuring data integrity and security. Tools were developed to facilitate engineering and reporting tasks while ensuring version control of attributes and geometry. The result was the proper management of terabytes of data within the engineering project itself and the enablement of rapid and thorough response to outside regulatory requirements and information requests.

Project **Structure Identification for Pipeline Risk Modeling**
Customer BP Canada NGL
Project Location United States and Canada
Phases IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

WorleyParsons Geomatics provided imagery acquisition and processing of high resolution aerial and satellite imagery for BP as part of a risk modeling program. Using the customer's classification and attribution standards, structures were classified, attributed, and metadata was developed. An internet mapping service was provided to show the results of the class locations. Careful planning was required to ensure that data developed during this program would migrate seamlessly into BP's existing pipeline data model.

Project **Freeport Pipeline Feasibility**
Customer United Tanking
Project Location United States
Phases IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

WorleyParsons ecologists and geomatics specialists worked together to conduct a corridor sighting study for a gas pipeline in southern Texas. GIS was used to assess wetlands data, land use data, aerial imagery, and the customer's suggested alternative pipeline landfalls and routes. WorleyParsons delivered four alternative routes to the customer within three days, saving the customer considerable project time. The alternative routes were proposed because they considered wetlands, land use, and flood plain areas. Our team suggested an approach to permitting that mitigated the need for a more detailed environmental impact report.



Project **Confidential Pipeline**
Customer Confidential
Project Location Canada, South Africa and Thailand
Phases IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

Through a WorleyParsons alliance, a central database containing bathymetry, surface geology, borehole locations, existing infrastructure, and other relevant datasets was created to support the development of preliminary subsea and pipeline layouts for conceptual infrastructure. This included the provision of geomatics standards defining datums, grid data transfer protocols, report formats, document control, and quality control. The data management service extended to data conversion and interface with specialist programs such as 3D modeling applications for subsea surface modeling.

WorleyParsons

resources & energy

Arctic Experience

More than 30 years of experience has taught WorleyParsons how to deal with construction related to permafrost and the design of pipelines and facilities that must operate at temperatures as low as -50°C.

1,000+
Arctic projects

-50°C
Operating temperatures

WorleyParsons has established strong working relationships with fabricators, contractors, transportation companies, suppliers, and indigenous groups in the Arctic.

Facilities have included onshore pipelines, production, central processing facilities, offshore islands, and subsea pipelines. In addition to the direct project requirements. We have developed infrastructure for docks, airstrips, ice roads, docks, camps, utilities, buildings, and communication systems of all types to support these needs. Gravel sources, regulatory requirements, and the timeline for development of permanent, project infrastructure all need to be taken into account. To support this unique set of circumstances, WorleyParsons brings to bear:

- local presences and offices in Arctic regions
- technical resource pool certified for Arctic cold
- the most current database on development costs in the North
- experience gained from executing more than 1,000 Arctic projects
- extensive permafrost construction experience
- arctic ditching experience in permafrost
- buried, chilled pipeline design experience
- arctic compressor station design experience
- strain-based (limit states design) pipeline designs in permafrost regions where frost/heave and thaw/settlement issues are critical
- innovative construction techniques and contracting strategies

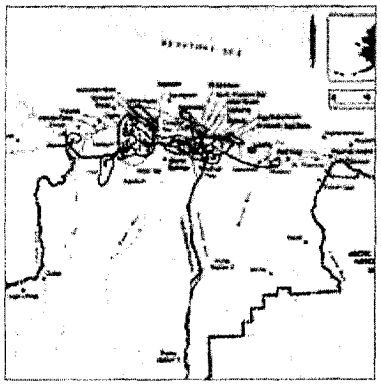
Modular design of facilities for remote Arctic regions and project logistics are key elements to project success. Project execution strategies that consider the unique needs and opportunities that a major Arctic pipeline project offers, are essential to deliver sound technology and reduced costs. WorleyParsons has a corporate history of working with our customers to develop the most appropriate and successful execution methodologies.

Project **Canadian Arctic Offshore Development Scenarios**
Customer Confidential
Project Location Canada
Phases IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

WorleyParsons conducted a study to determine a range of capital costs to develop potential offshore oil and gas discoveries in the Beaufort Sea. We developed costs for one oil case of 250 kbopd and two gas cases of 500 MMSCFD and 1000 MMSCFD for distances from 0 to 200 km offshore and water depths of 0 to 200 m. The study included artificial islands, caisson islands, caisson retained islands (CRI) and offshore platforms. Subsea pipelines and satellite production facilities were evaluated as well.

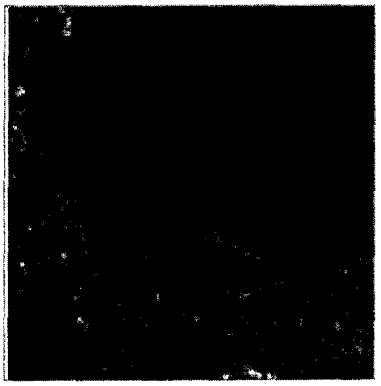
Project **Badami Oil Field Development**
Customer BP Exploration (Alaska)/ExxonMobil/Phillips Alaska
Project Location United States
Phases IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

This grassroots development included a central oil processing facility, a wellsite pad for 40 wells, a buried 50 km, 20" oil pipeline, as well as associated utilities and operations infrastructure. The facilities utilized an 80,000 BWPD water injection system and 30 MMSCFD of gas reinjection system. The pipeline was completed with a refrigeration unit to cool the oil to prevent the permafrost from melting. The infrastructure included three gravel mine sites, runways for light and heavy aircraft and a gravel and sheet pile dock. WorleyParsons completed design and construction services for the surface production facilities and pipelines, in conjunction with a fabricator and three construction contractors.



Project **BP Liberty Field Development**
Customer BP
Project Location United States
Phases IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

WorleyParsons evaluated several development concept alternatives and selected a single concept to carry into the Define Stage. The Liberty oil field lies in federal waters of the Beaufort Sea, approximately 13 km from shore, and near BP's existing North Slope Developments at Badami and Edicott. BP intends to develop this asset with ultra-extended reach drilling from an offshore gravel pad. The three-phase production stream will be transported from greenfield production gathering facilities at the well pad to the host production facility via new 24". diameter, 19- to 24- km long pipeline. Peak production rate range is 38,000 to 55,000 bpd of oil.



Project **Umiak Cost and Schedule Study**
Customer EnCana Corporation
Project Location Canada
Phases IDENTIFY > EVALUATE > EXECUTE > OPERATE

WorleyParsons performed a conceptual engineering study for a grassroots gas production facility at the northeast end of Richards Islands, NWT. We completed three capacity cases of 40, 80 and 160 MMSCFD of sweet gas. Included was a main facility plus one satellite facility, a 23 km above-ground pipeline connector from the satellite to the main facility, and a 23 km buried sales pipeline to connect to the proposed Mackenzie Gas Pipeline. Process concepts consisted of a wellsite, gathering system and plant site for dehydration of the natural gas and natural gas liquids, refrigeration, and gas compression. Evaluation included an airstrip, all season roads, ice roads, and barge facilities on the Mackenzie river.

WorleyParsons
resources & energy

Offshore Pipelines and Subsea Systems

INTECSEA Engineering is a diverse and highly qualified company with a history of delivering innovative engineering and project management solutions to customers worldwide.

150
Subsea pipeline projects in the last 10 years

4,000+
kilometres of offshore pipelines since 1998

As the worldwide search for hydrocarbons moves into ultra-deep waters, technical challenges multiply and the scale of the investment required to safely deliver these projects, continues to escalate. Two companies that have been at the forefront of meeting this challenge for many years through both leadership and technical innovation in the Gulf of Mexico, West Africa, and other deepwater locations, are INTEC Engineering and WorleyParsons Sea.

INTECSEA incorporates all the capabilities within INTEC, WorleyParsons Sea, and the WorleyParsons floating systems, offshore pipelines, and subsea teams. This allows us to offer customers a full-service solution in a range of specialty areas including subsea production, offshore pipelines, marine production risers, flow assurance, and floating production systems including all types of deepwater hulls and mooring systems.

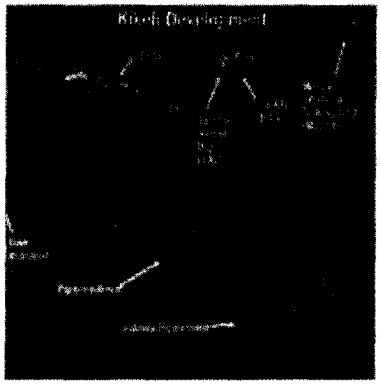
When harnessed with our established capability in the design of offshore facilities ranging from the simplest of unmanned platforms through to complex floatover topsides weighing up to 30,000 tonnes, WorleyParsons is now able to offer customers a single, integrated project delivery service from "wellhead to the market" for their most challenging deepwater developments.

INTECSEA has an exceptional track record of delivering innovation into a market that is one of the most technically challenging in the world.

INTECSEA provides our deepwater customers with a shorter project delivery cycle, advanced technologies to enhance project economics, reduced interface management requirements and, most importantly, a level of project delivery certainty that only comes from a highly experienced and unified team operating under a single leadership structure.

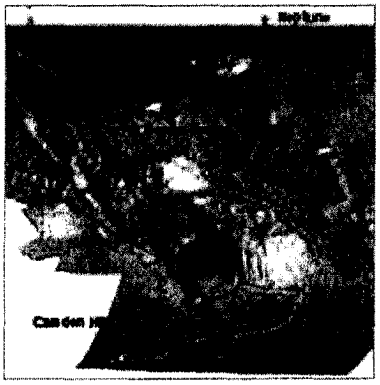
Project **El Paso Energy Prince Field Development**
Customer El Paso Energy Partners (formerly Leviathan Gas Pipe Company)
Project Location United States
Phases IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

The development is located in Ewing Bank offshore Louisiana at 1,490 ft. The recommended surface facility was the MODEC International Moses Mini-TLP. The TOP was designed to support a topsides process facility. A contract was awarded to MODEC International in July 1999 for fabrication of the Moses TLP hull, tendons, and production riser. The installation of the floating facility was completed in late 2001 with the first oil achieved early 2002. INTECSEA's scope of services included: overall project management; invitation to bid preparation; bid clarification activities; contract negotiations; design supervision; geophysical/geotechnical survey; fabrication and installation super-vision; and detailed design of the two 12" export oil and gas steel catenary risers (SCRs).



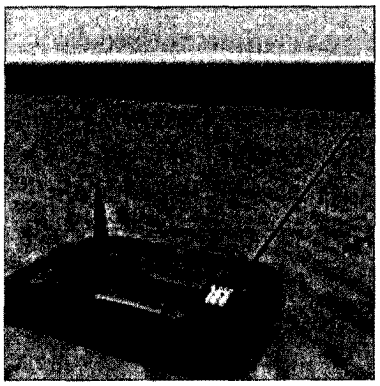
Project **Murphy Kikeh Field Development**
Customer Petronas Carigali Sdn Bhd and Murphy Sabah Oil Co. Ltd.
Project Location Malaysia
Phases IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

The Kikeh development consists of an FPSO, dry tree unit, subsea well manifolds and flowlines. The Kikeh area is located 120 km northwest of the island of Labuan, offshore Sabah, East Malaysia at approximately 1,300 m water depth. INTECSEA provided engineering and project management services to the project team during the detailed design, construction, and installation of the facilities. Specific areas of focus included detailed design review of the FPSO and DTU topsides facilities, flexible flowlines and risers, subsea equipment, field layout, interface management assistance, regulatory compliance, HSE studies, safety case development, and risk assessment.



Project **Canyon Express**
Customer TotalFina Elf in partnership with BP and Marathon Oil
Project Location United States
Phases IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

The Canyon Express project is a first-of-its-kind industry initiative to jointly develop three gas fields in the Gulf of Mexico, operated by different companies through a common production gathering system. INTECSEA's scope included FEED and project execution for the complete subsea development. The project value is estimated at US$9M. The three separate fields include Aconcagua in Mississippi operated by TotalFina Elf, King's Peak in Desoto Canyon and Mississippi Canyon operated by BP, and Camden Hills in Mississippi Canyon operated by Marathon. Peak gas production from the three fields will be approximately 500 MMSCFD. A gathering system consisting of dual 12" pipelines will transport the gas from the three fields approximately 88.5 km to Williams Canyon station platform.



Project **Oooguruk Offshore Field Development**
Customer Pioneer Natural Reources Alaska, Inc.
Project Location United States
Phases IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

INTECSEA provided pre-FEED, FEED, detailed design, and construction support for the development of the Oooguruk Field in the Beaufort Sea. This field is located approximately 8 km north of the Kuparuk River Unit coastline on the north slope near the mouth of the Colville River. Drilling is from the offshore gravel island located in approximately 5 ft of water. Produced fluids are gathered and transported to shore in a buried subsea three-phase flowline. Onshore, the flowlines transition to above-ground insulated lines and run to an existing pipeline at a drilling facility owned by another operator.

WorleyParsons
resources & energy

Select

Select is the specialist front-end division of WorleyParsons. The experts who make up *Select* recognize that making the right decisions during the initial stages of a project is essential to maximizing ultimate business outcomes.

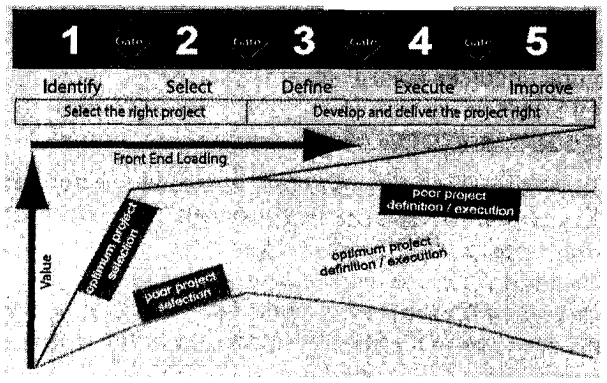
500+
Select personnel

Cost estimates for projects from
20K-20B
total installed cost

Select is an integral part of the WorleyParsons global hydrocarbons project delivery capability. *Select* provides pre-FEED services to asset owners, operators, and investors by utilizing WorleyParsons' extensive real-world experience in total project delivery, asset operation, and industry best practice.

These services enable customers to be confident that the critical decisions made in the conceptual stages of a project will satisfy their ultimate business objectives. Specific areas of expertise associated with pipeline projects include:

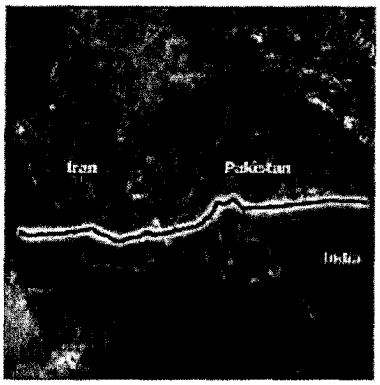
- **Greenfield Project Development Planning** – *Select* provides sustainable project development scenarios to further customers' decisions for the most applicable business case.
- **Compressor/pump station spacing** – included optimization against pipeline diameter and allowance for future expansion scenarios.
- **Brownfield Field Development Planning** – *Select* applies current operational know-how to deliver cost-effective increases in capacity that maximize whole-of-life returns from existing assets.
- **Financial and Economic Analysis** – *Select* accesses the global database of major capital projects within WorleyParsons, enabling customers to support their strategic investment decisions with accurate and reliable development planning data.



Phases 1 and 2 (Identify and Evaluate) are recognized as the value-adding phases. It is during these phases the opportunity to find the upside of the development cases is found. *Select* works best by forming an integrated team with the customer, bringing technical development in line with operational know-how to identify the areas of value enhancement. *Select* uses formalized value-improving practices to ensure our customers achieve the maximum possible front-end loading within the constraints of the development schedule and budget.

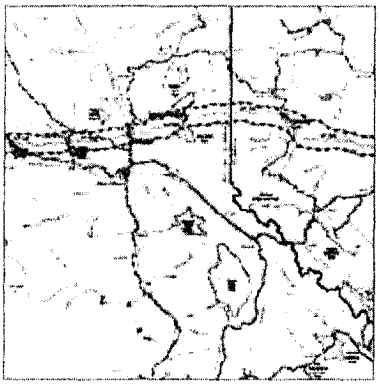
Project **Mackenzie Gas**
Customer Imperial Oil Resources Ventures Ltd.
Project Location Canada
Phases IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

The Mackenzie Gas project is an integrated pipeline facility designed to collect natural gas from producers in the Arctic Mackenzie Delta and deliver it to receiving pipelines in Alberta. The facilities include production pads at three locations, compressor stations, a gathering system, a process plant, 12" liquids pipeline to Norman Wells, and a 30" natural gas mainline running south to the Alberta border. The total length of the pipeline system will be about 1,200 km. WorleyParsons developed the conceptual design and provide technical input into the required regulatory permit applications. Conceptual design included the selection of pipe sizes and operating pressures and temperatures for the pipeline along with the associated compression facilities.



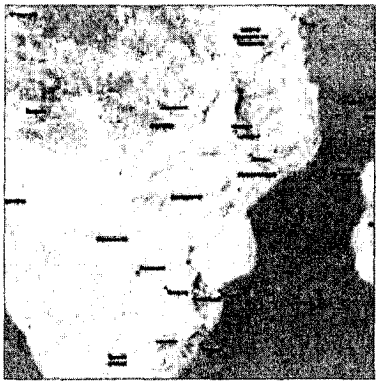
Project **Iran-Pakistan Gas Pipeline**
Customer BHP Billiton/NIGEC
Project Location Iran, Pakistan, and India
Phases IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

WorleyParsons, through the APE joint venture, completed the pre-feasibility study on the 2,600 km gas import pipeline taking South Pars gas to major consumption centers in Iran, Pakistan, and India. The study report defined the development and refinement of selected pipeline options and estimated costs plus associated project technical and logistical implementation strategies. BHP Billiton recently requested an update to the study to include increased gas demand and a possible extension of the pipeline through to China as the project continues to gain momentum.



Project **Gateway Pipeline**
Customer Enbridge Pipelines Inc.
Project Location Canada
Phases IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

This project included a FEED study for Enbridge Pipelines Inc. that encompassed engineering services to support regulatory applications for the construction of a greenfield crude oil and diluent pipeline system from Edmonton, Alberta to a marine terminal located in Kitimat, BC. The pipeline will transport crude oil in a 30" diameter pipeline with a design capacity of 400K bpd. The 1,160 km crude oil pipeline would be paired with a new 16" diluent pipeline to carry 150K bpd to Edmonton. Terminals at Edmonton and Kitimat will have 21 crude tanks and eight condensate tanks. Other pipeline facilities include marine top works facilities at Kitimat to load oil tankers and unload condensate tankers.



Project **Feasibility Study - Fuel Pipeline and Storage Facility**
Customer Venessia Petroleum
Project Location Mozambique
Phases IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

Malawi is a land-locked country with no oil and gas resources. As a result, all fuel must be imported from other countries using truck and rail tankers. WorleyParsons studied the feasibility of importing fuel through a new pipeline, that included petrol, jet A1, illuminating kerosene, and diesel, batched through a single pipeline from an import terminal to a road and rail tanker distribution terminal in Malawi. Pipeline design capacity was 1.781 m^3/day. The project also included five new storage tanks with a total storage capacity of 36,600 m^3 at Beira plus nine new storage tanks at Nsanje with a total storage capacity of 163,000 m^3.

WorleyParsons
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Improve

Improve is a service focused on improving our customers' business outcomes. It is a tailored service to meet the needs of individual sites.

US$6B+

Improve value created for customers globally per year

WorleyParsons' *Improve* is a core service for brownfield operations focused on the delivery of major projects, upgrades, de-bottlenecking and maintenance; project portfolio management, and support services to sustain assets and improve business performance.

Using the knowledge accumulated from more than 120 international alliances and long-term contracts, we have developed a culture and a suite of unique tools, systems, and delivery methodologies that incorporate industry best practices.

10,000+

Improve personnel working globally

We have strong industry-specific knowledge and a track record of success using our performance-based, relationship contracting model. The trust that this generates enables WorleyParsons to deliver maximum value to customers using local teams, supported both regionally and globally.

WorleyParsons has more than 10,000 personnel working in more than 120 alliances executing over 20,000 projects annually with a capital value in excess of USD$4B.

20,000+

Improve projects per year

WorleyParsons *Improve* draws upon its experience, capability, tools, and systems to provide a variety of services within the Operate phase. *Improve* is delivered through an alliance contract and relationship, is aligned to our customers' requirements, and delivers value add and improvements to our customers and their assets.

Improve encompasses the following values:

Integration, innovation, and flexibility

Motivated and enthusiastic people in an integrated team

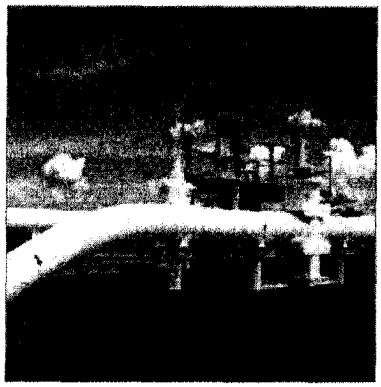
Portfolio approach to sustaining capital program and projects delivery

Relationships are transparent, honest, and aligned to challenge and drive performance

Operational excellence while maintaining a focus on safety

Value-Adding and outcome focused

Enhancing and optimizing our customers' assets

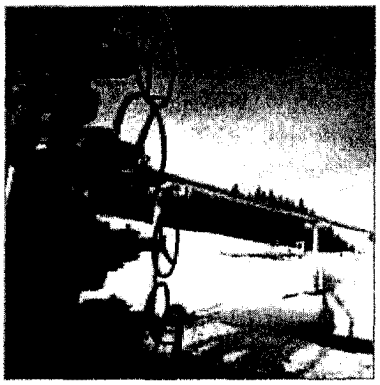


Project **Engineering Services Agreement**
Customer Enbridge
Project Location Canada
Phases IDENTIFY EVALUATE DEFINE EXECUTE OPERATE

WorleyParsons is a preferred engineering service provider to Enbridge and many of its affiliates through its long-term *engineering services agreement* to their major capital project development group, liquid pipeline business, and gas business in eastern Canada. WorleyParsons provides project specialization in all types of pipelines and pipeline facilities, storage facilities, measuring and ancillary facilities. We also provide project management, engineering, geomatics, procurement and construction management support services.

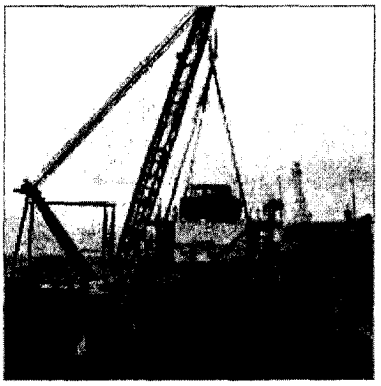
Project **EPCM Alliance**
Customer Epic Energy
Project Location Australia
Phases IDENTIFY EVALUATE DEFINE EXECUTE OPERATE

WorleyParsons is Epic Energy's preferred provider of engineering services for national operations within Australia. Epic Energy is one of Australia's largest gas transmission companies. As part of this contract, WorleyParsons provides integrated EPCM services to support Epic's gas pipeline and compression assets in Western Australia, Queensland, and South Australia; and new pipeline engineering services including the 180 km, 16" QSN Link project.



Project **Talisman Energy - Prime Relationship**
Customer Talisman Energy Inc.
Project Location Canada
Phases IDENTIFY EVALUATE DEFINE EXECUTE OPERATE

Since 1991, Talisman Energy Inc., through the Talisman Prime Relationship, has continuously engaged WorleyParsons to provide engineering, procurement, and construction management services for its oil and gas assets in western Canada. The work completed over the years has included well tie-ins, major sour mountain pipelines, compression additions, plant modifications, plant upgrades, grassroot facility installations, proactive and reactive operations support, and complete drawing management. Cost-effective implementation of capital projects is a key component for Talisman in reaching their return-on-investment goals.



Project **Engineering Design & Manpower Services**
Customer Brunei Shell Petroleum
Project Location Brunei Seri Begawan
Phases IDENTIFY EVALUATE DEFINE EXECUTE OPERATE

In 2005, WorleyParsons won the asset services contract for Brunei Shell Petroleum. The contract covers the execution of engineering design and provision of manpower services for screening studies, front-end development, conceptual and detailed design, process, mechanical, pipeline, civil/structural, instrument, electrical and telecommunications engineering, project management, procurement, construction and commissioning, as well as operations/maintenance support.

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Leak Detection

WorleyParsons' LINEGUARD is a field-proven, innovative approach to modeling the transient behavior of liquid pipelines. It provides accurate, robust, model-assisted, material-balance leak surveillance 24/7 and can reveal the location of the leak.

43
Installations since
1994

As the worldwide network of pipelines age and population centers encroach on territory that was once vacant land, the public and environmental impact of a pipeline leak becomes significant. Product leaks pose a significant threat to the safety of people, wildlife, and the environment. In addition, the economic cost associated with line downtime, loss of product, remediation, lawsuits, and fines can run into the millions of dollars.

LINEGUARD is a proprietary, dependable, cost-effective program designed to perform leak detection and location. It is intended for main lines, short lines, laterals, and reversible lines and easily covers intermittent and continuous operations, handling everything from single commodities to multi-product batches.

44
monitored commodities

LINEGUARD provides continuous, 24/7 monitoring even during transient conditions such as shutdowns, startups, or valve operations. In ordinary leak detection systems, such conditions tend to cause false alarms forcing operators to constantly adjust or disarm the system. LINEGUARD replaces inconsistent leak detection with reliable, continuous protection that customers can depend on.

1,650
Kilometers of pipe protected by LINEGUARD

LINEGUARD unique features include:

- compliance with API and CSA standards
- accurate and quick location pipeline leaks
- seamless integration into existing SCADA systems while remaining independent of SCADA upgrades
- provides logs, alarms, and data retention to suit operator preference
- SCADA capability can be added for users that need leak detection but do not have a SCADA system
- ongoing professional product support.

Our Vision

WorleyParsons will be the preferred global provider of technical, project and operational support services to our customers, using the distinctive WorleyParsons culture to create value for them and prosperity for our people.

Leadership

- Committed, empowered and rewarded people
- EcoNomics™ - delivering profitable sustainability
- Integrity in all aspects of business
- Energy and excitement
- Minimum bureaucracy

Agility

- Smallest assignment to world-scale developments
- Local capability with global leverage
- Responsive to customer preferences
- Optimum solutions customized to needs

Relationships

- Rapport with all stakeholders
- Open and respectful
- Collaborative approach to business

Performance

- Zero harm
- Results for our customers and employees
- Creating wealth for our shareholders
- World-class resources, capability, and experience

WorleyParsons

resources & energy

For further information about
our global capability, email
pipeline@worleyparsons.com

www.worleyparsons.com

WorleyParsons
resources & energy

EcoNomics

Improve

Asset Integrity and Business Performance Improvement

Business Profile

WorleyParsons
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EcoNomics

"There is no task so important or so urgent in our business, or our customers' businesses, that it overrides the need to work safely..."

John Grill, WorleyParsons CEO

Zero Harm is our corporate vision for health, safety & the environment (HSE).

We are committed to our vision; it applies to all of our operations, at all times, in all locations, and at all levels of responsibility.

We will actively work to align our expectations and behaviors with those required to achieve our vision through a dedication to continuous improvement.

The launch of our HSE framework, OneWay™, enables us to further align and consolidate our global systems and procedures and continue to work with our personnel to reinforce a culture that underpins our drive to achieve our corporate differentiator of industry leadership in the HSE performance.

OneWay™
to zero harm

Corporate Overview

WorleyParsons is a leading global provider of professional services to the resources & energy sectors, and the complex process industries.

We cover the full asset spectrum, both in size and lifecycle, from the creation of new assets, to services that sustain and improve operating assets.

Our business has been built by working closely with our customers through long term relationships, anticipating their needs and delivering inventive solutions through streamlined, proprietary project delivery systems. Strong growth continues to characterize our performance both through organic development and through strategic acquisition as we strive to provide tailored services wherever our customers need us.

- Power
- Minerals & Metals
- Hydrocarbons
- Infrastructure & Environment

37
countries

114
offices

31,700
personnel

EcoNomics™ Delivering profitable sustainability

EcoNomics™ is our range of services and technologies that profitably embed environmental, social and financial sustainability into project delivery, across the asset lifecycle. It is a seamless extension of our established project delivery capability in the key areas of Assessment, Efficiency and Treatment & Mitigation. We are committed to working with our customers to turn their sustainability objectives into good business practice.

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WorleyParsons *Improve*

Asset integrity and Business Performance Improvement.

Improve is a service focussed on improving our customers' business outcomes. It is a tailored service to meet the needs of individual sites.

WorleyParsons *Improve* is a core service for brownfield operations focused on the delivery of major projects, upgrade, de-bottlenecking and maintenance projects, project portfolio management and support services to sustain assets and improve business performance.

Using the knowledge accumulated from more than 120 international alliances and long-term contracts, we have developed a culture and a suite of unique tools, systems and delivery methodologies that incorporate industry best practice.

We have strong industry-specific knowledge and a track record of success using our performance-based, relationship contracting model. The trust that this generates enables WorleyParsons to deliver maximum value to customers using local teams, supported both regionally and globally.

WorleyParsons has more than 9,000 personnel working in over 120 alliances executing more than 20,000 projects annually with a capital value in excess of USD 4 billion.

WorleyParsons *Improve* draws upon our experience, capability, tools and systems to provide a variety of services within the operate phase. *Improve* is delivered through an alliance contract and relationship, is aligned to our customers' requirements, and delivers value add and improvements to our customers and their assets.

The *Improve* culture encompasses:

Integration, innovation and flexibility

Motivated and enthusiastic people in an integrated team

Portfolio approach to sustaining capital program and projects delivery

Relationships are transparent, honest and aligned to challenge and drive performance

Operational excellence whilst maintaining a focus on safety

Value Adding and outcome focussed

Enhancing and optimising our customers' assets

120+

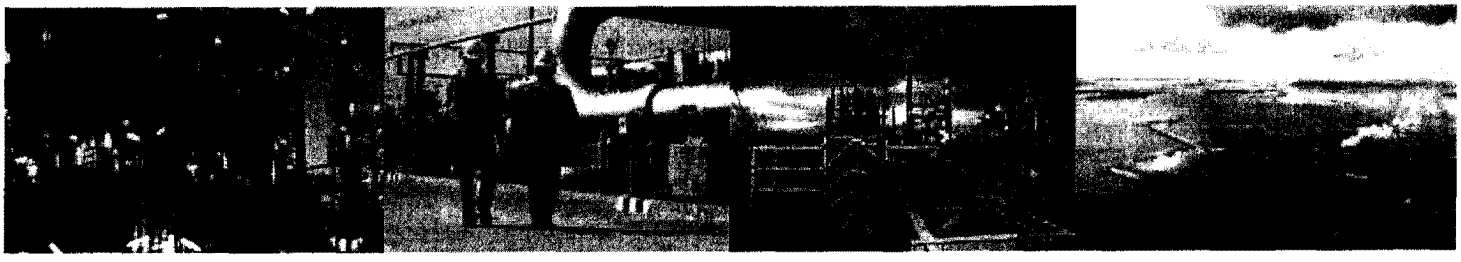
Improve Contracts Worldwide

9,000+

Improve Personnel

20,000+

Improve Projects/Year



Creating Value

WorleyParsons *Improve* is committed to delivering demonstrable value year on year through our long-term relationships.

Successful *Improve* contracts are based on strong relationships. WorleyParsons culture is one of committed, empowered and rewarded people, using open and respectful communication, being responsive to customer preferences, and a company-wide focus on excellence and continuous improvement.

Our relationships are based on trust and focused on adding value for our customers throughout the life of the contract.

Our approach is to establish an integrated team focused on achieving our customers' business objectives while reducing costs, adding value and improving the whole of life value of their assets.

Our decades-long commitment and success in long-term relationships is testament to our open and communicative culture and our ability to meet our customers' needs on a continually improving basis.

120+

Improve Contracts Worldwide

USD 6B

Estimated Total Value Delivered to our Customers Annually

Current Contracts of 10 or More Years Duration

Start Date	Contract	Start Date	Contract
1970	Sterling Chemicals, USA	1995	Woodside LNG, Australia
1987	Shell Martinez, USA	1995	Incitec Pivot, Australia
1991	Syncrude, Canada	1996	Petro Canada Oil & Gas, Canada
1991	Tennessee Valley Authority, USA	1997	Apache Alliance, Australia
1992	Imperial Oil, Canada	1997	NZRC Refinery, New Zealand
1992	Shell Canada, Canada	1998	Qenos Plastics, Australia
1992	Talisman, Canada	1998	Brunei LNG, Brunei
1993	Shell Todd Oil Services, New Zealand	1998	Huntsman Chemicals, Australia
1995	Tesoro Los Angeles Refinery, USA	1999	EPCOR Power Generation, Canada

Adding Value at Syncrude (CoSyn Alliance) — Canada

Colt WorleyParsons has a contract with Syncrude in Canada which commenced in 1991. This is a fully integrated alliance with the project team named CoSyn which undertakes a large portfolio of projects for Syncrude. Through this long-term relationship WorleyParsons has been able to implement specific long-term and ongoing initiatives which have delivered significant savings to Syncrude. By 2008 the Alliance team has submitted CAD 300 million worth of ideas and improvements. Of these, CAD 135 million has been accepted by Syncrude as savings in 2007. Of this, CAD 110 million was saved on major projects within the CoSyn office and the remainder identified through our base plant projects and other continuous improvement ideas. Each year, various project teams are asked to set targets for savings and then to keep value creation at the forefront of all project meetings.

Alignment

WorleyParsons knows that alignment of objectives is the foundation of success.

At WorleyParsons *Improve* we understand the critical importance of alignment with our customers. We bring a complete capability in relationship assessment and awareness.

We work with our partners to drive a performance culture through implementing a comprehensive range of tools and processes for successful and safe delivery of projects, and share our experience to build capability in our customers through a structured change management process.

Through alignment workshops, both initially and ongoing, we align our people to our customers. We set clear expectations for all team members to ensure common understanding of the values which underpin behaviors, and articulate the behaviors which will drive success in our *Improve* relationships.

The following quote demonstrates our ability to work with our customers to achieve win – win outcomes through cultural alignment and cultural change.

"Qenos was looking for a cultural change and a step improvement in capital delivery and headcount with the decision to form an engineering alliance in 1997. We chose WorleyParsons because we saw a unique alliance-focussed culture and an organisation that was flexible to fit with customer requirements.

Experience since then has vindicated that decision. The WorleyParsons-Qenos Alliance is still highly successful a decade later, which is testimony to the strength of the relationship, providing a great vehicle for two-way learning and development opportunities."

Graham Smith
Qenos Engineering Manager

Alignment of Cultures Provides an Optimal Service — **Saudi Arabia**

WorleyParsons provides engineering and project management services via a multicultural team on our Saudi Aramco Maintain Potential Program (MPP) contract, based in Saudi Arabia (Al-Khobar). This multicultural team has in excess of 320 personnel with approximately 30% Saudi nationals, 30% Filipino nationals, and 30% US, UK and Australian nationals. The transparent and structured sharing of project information ensures the team has a common goal with set tasks and milestones. Consistency in management delivery and decision making provides clarity and eliminates ambiguity. As a result, this diverse team provides an optimal service to Saudi Aramco.

Image supplied by StockXchng

People

WorleyParsons recognizes that attracting, developing and retaining exceptional people is one of our competitive advantages. We deliver long-term sustainability to our *Improve* relationships through the quality of our people, their commitment, empowerment and technical depth.

With a global spread of 118 offices and a footprint in all major industry sectors, we offer a diverse range of opportunities and career pathways to our people. We follow best practice selection and recruitment processes, employ the best people available, provide a thorough induction program and ensure our people receive ongoing skills development throughout their careers.

We have a strong Graduate Recruitment and Development Program, and a 'Next Gen' program to focus on our early-to-mid-career staff. This ensures we retain our quality people and our customers experience low turnover of our personnel on their contracts.

We take pride in the depth and breadth of skills and experience we provide our customers through WorleyParsons *Improve* contracts. Our focus on succession planning and career development enables us to deploy highly skilled teams to meet our customers' requirements.

Through our established centers of excellence and high value engineering offices around the world, and with more than 32,200 people globally, we are able to provide our customers with specialist expertise to supplement the skills of our *Improve* personnel when required.

32,200
Personnel

USD 4B
Capital Value Executed Under *Improve* Contracts Annually

"For an Improve contract to be successful, by whatever metrics one wants to choose, working relationships need to be developed and nurtured based on open communication and trust."

Geoff Rackette
WorleyParsons Director of Projects,
CoSyn, Canada

Start Date: 1996
Positions Held: Mechanical Engineer, CoSyn; Project Engineer, CoSyn; Department Head - Mechanical Engineering, CoSyn; Manager of Engineering, CoSyn
Regions: Canada

"Improve calls upon many skills which involve listening to our customers to better understand their requirements to ensure we deliver what they want, not what we want to provide."

Michael Dunn
Engineering and Projects Manager,
Saudi Aramco Offshore MPP, Saudi Arabia

Start Date: 2001
Positions Held: Project Engineer, Karratha Gas Plant; Alliance Deputy, BP Kwinana Refinery; Alliance Manager, Caltex Kurnell Refinery
Regions: Western Australia & New South Wales, Australia; Saudi Arabia

"Improve facilitates a focused approach to our tasks and gives a sense of global support in what we do locally."

Nik Naser
Manager for East Coast Malaysia
(Kerteh/Kuantan) Offices

Start Date: 2000
Positions Held: Mechanical Engineer; Project Engineer; *Improve* Project Manager, Kuala Lumpur Office
Regions: Malaysia; Kuala Lumpur and Kerteh/ Kuantan

Know-How

WorleyParsons *Improve* is committed to the development of our unique know-how and deployment through our *Improve* people to create a high performance culture.

WorleyParsons understands that even experienced and highly skilled people require ongoing training and professional development. A unique attribute of *Improve* is that we train our people to ensure they have the unique set of skills required to manage long-term relationships. Specific courses developed by WorleyParsons for this purpose include the Contract Managers Professional Development Program which is held several times a year in each Region. This brings together current and aspiring Contract Managers to strengthen leadership and management skills, build networks and share best practices. We also undertake Project Management training courses for aspiring Project Managers as part of our succession planning.

Learning and development at WorleyParsons is focused on extending upon our strong capability to ensure we deliver to the highest possible standards and ensure the safety of our people is at the forefront at all times. From initial induction training through to relevant discipline skill building programs, there is a strong focus on building upon the capability within our *Improve* contracts.

All *Improve* sites have a competency and training matrix against which we assess our people and prioritize training delivery. This includes a comprehensive safety and compliance curriculum; training in the use of the relevant WorleyParsons and/or customer systems, tools and processes; and training programs to develop supervisory and team leadership skills.

Enhancing capability requires robust learning and development identification and planning processes. To streamline such processes we employ a Learning Management System (LMS) to enable our HR teams to better manage our peoples' development. The LMS provides a more effective and efficient method of identification and reporting for all mandatory/legislative, competency and development training needs, resulting in improved planning and training of targeted groups.

Training at Syncrude — Canada

In our Syncrude contract in Canada a number of programs have been developed to help newcomers to Canada. One of these programs is the English for Engineering program in which speakers of English as a second language are provided with additional training in how to better communicate in our industry. The training takes place in our office but is provided by instructors from a local college.

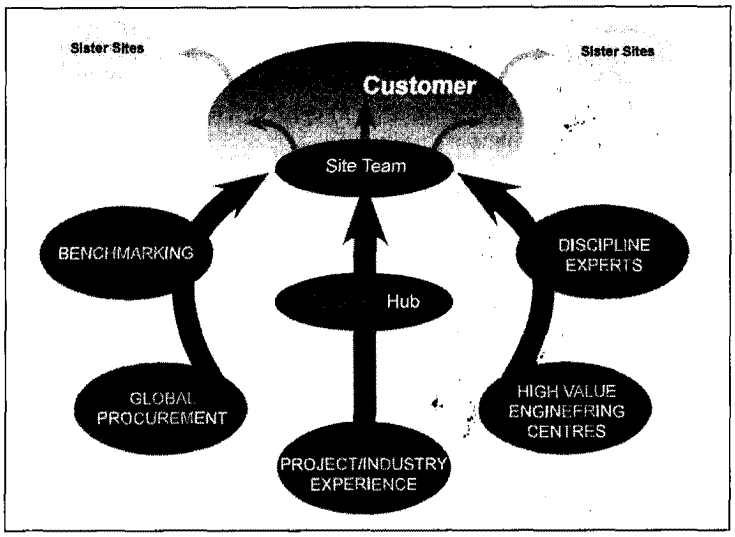
We have also implemented a formal mentorship program, called the CoSyn Active Learning and Mentorship Experience (CALME). We provide formal training to both mentors and staff and set up mentoring relationships – pairing individuals with specific needs and goals with mentors interested and capable of developing those skills in others. This program is being adopted across the Canadian Region.

Training at ExxonMobil Altona Refinery — Australia

WorleyParsons is responsible for Project Management as part of our scope of works at ExxonMobil's Altona Refinery. Our team worked with ExxonMobil to develop a training program which includes a mixture of ExxonMobil and WorleyParsons training together with industry based training. Over a two month period all site based Project Managers for the alliance attended training sessions covering safety and risk, project controls, project management systems, noise awareness, construction safety training for engineers (red card), contract awareness and industrial relations training.

Local Delivery - Global Support

WorleyParsons *Improve* recognizes every customer is unique and that every contract has different requirements. We tailor the work process to best serve our customers' needs.



With 118 offices in 38 countries, WorleyParsons has an extensive global delivery capability. Whilst we have a large geographic spread, we provide services to our customers locally.

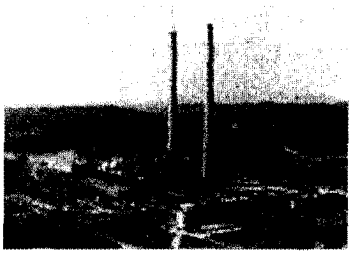
To support our site offices, we have established *Improve* hubs around the world, enabling us to pool resources and meet changing resource needs across several contracts within a region. Hubs have been established in each global region.

Hubs provide flexibility to meet changing resource requirements at short notice and enable sharing of systems, best practices and ideas. For example, in Gladstone, Australia resources and systems are shared across our Rio Tinto Yarwun Refinery and Boyne Smelters contract. Both facilities are owned by Rio Tinto.

WorleyParsons has High Value Engineering Centers (HVEC) located in Beijing, Bangkok, Hyderabad and Kuala Lumpur. HVECs provide cost effective access to a large pool of skilled resources. The ultimate value to our customers is reduced costs, improved project schedules and world-class services. In addition to our HVECs, we have offices in Jakarta, Singapore and Manila providing similar services. Each of our *Improve* contracts has the ability to draw upon these services as required.

Maximizing our Effectiveness through *Improve* Hubs **Australia**

With three contracts in very close proximity in Newcastle, WorleyParsons created a Hub Office in Newcastle, Australia to support the Tomago Aluminium, Hydro and OneSteel alliance contracts. Whilst each contract has its own stand-alone team on site, an additional pool of resources, largely design engineers, technical leaders and drafters, is based in the Newcastle Hub and is used to meet changes in resource requirements for the three contracts. This approach provides our customers with flexibility and an opportunity to share knowledge across the sites. The Hub also provides services to other major customers to support the establishment of new alliances.



Mobilization

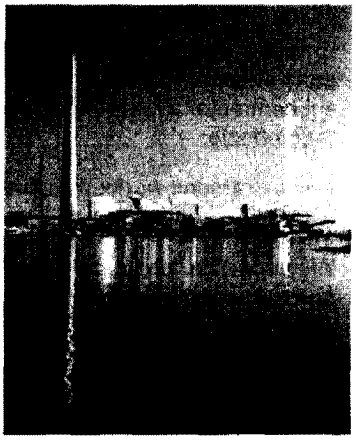
WorleyParsons *Improve* has a proven streamlined mobilization process which enables us to tailor the services we provide to customers' unique needs.

WorleyParsons achieves core consistency and delivers a proven streamlined process through a standard suite of systems, tools and processes.

Our *Improve* suite of tools is then tailored to meet each customer's requirements. The emphasis we place on achieving seamless and fast mobilization means we have reduced our average mobilization time to three months. For example, our mobilization team successfully mobilized the Nyrstar Port Pirie Alliance in 90 days.

"Nyrstar Port Pirie engaged Worley Parsons as their preferred Engineering Alliance partner in mid 2006 and the benefits have been significant and immediate. Mobilisation to site was complete within 90 days, resulting in an integrated team of dedicated Alliance and Nyrstar seconded professionals. Highlights for FY2007 included delivery of critical projects around the Slag Fuming Coal Injection upgrade and Copper Plant Structural Recovery. Critically, the commitment to on-time and within budget delivery of the capital plan was fully achieved."

Matt Howell
Nyrstar Port Pirie, General Manager



Fast Track Mobilization at TAC — Australia

In 2003 WorleyParsons was selected by Tomago Aluminium Corporation (TAC) at Tomago, NSW, Australia to implement an *Improve* contract. TAC is the largest aluminium smelter in Australia and had for several years operated with an outsourcing arrangement for supply of engineering services and project delivery. Due to the need to ensure continuity of project delivery and a smooth transition from the existing engineering contractor, a mobilization plan was implemented by us to take over project delivery within 60 days of notification by TAC of WorleyParsons selection for the contract. This target was achieved and within 120 days the new *Improve* team was fully operational. The transition from the previous engineering contractor was completed on plan without significant plant interruption, all key projects were executed to targets and a smooth transfer of key staff to the new team occurred.

Mobilization in a Different Culture — Russia

In 2007 WorleyParsons established an *Improve* contract with SMR (part of the Basic Element Group) to provide project delivery services for their operations across Russia. SMR is engaged in the exploration, extraction, enrichment and metallurgical processing of copper and molybdenum and is the largest molybdenum supplier in Russia and one of the largest suppliers of ferromolybdenum in the world. The mobilization was particularly challenging given the remote location, travel logistics and visa restrictions.

Despite these challenges the new *Improve* team is now fully operational, with communications and management systems in place for project development and delivery. As a result SMR now has the capability to develop and manage a large portfolio of projects throughout Russia utilizing WorleyParsons' systems and processes to ensure predictable outcomes for their capital investments.

Capital Planning

WorleyParsons *Improve* works with our customers to improve and optimize their assets as part of the journey to operational excellence.

WorleyParsons understands the importance of capital works planning in maximizing our customers' operations. Systematic and rigorous planning of the capital works program ensures works are correctly prioritized and only the right projects proceed.

Recognizing the critical nature of front end planning as new projects arise, we assist our customers with front end and capital planning to attract and smooth resources. This adds the most value and strengthens customer relationships. Key to this is forward projection planning, where resource requirements are forecast on a rolling monthly basis, with at least a one year planning horizon.

Critical path activities, such as approval deadlines and baseline data availability requirements, are defined during early stages. Risks to the project scheduling and delivery are then identified. At times of limited staffing and subcontractor availability, planning during early stages identifies additional potential risks and actions to mitigate their effects.

WorleyParsons works with customers to develop and implement a capital planning process to deliver full expenditure of the annual capital plan on approved projects to achieve planned business objectives.

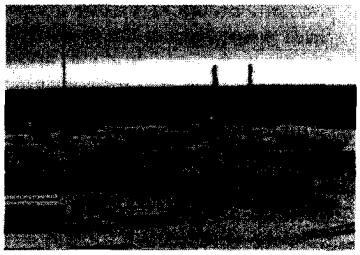
We undertake early and joint front end project selection and capital planning to prioritize the portfolio of projects and present business cases to ensure projects with the highest return on investment proceed. We then suggest changes to the capital plan to realize the full value and service potential of the capital works program. Once the capital plan is authorized we safely execute the approved projects on time and within budget.

Delivering Significant Improvements to our Customers — Australia

WorleyParsons has delivered significant improvements to OneSteel through our *Improve* contract. By initiating regular senior management reviews, improving the measurement and visibility of KPIs and redefining and clarifying roles and responsibilities of the *Improve* implementation team, we have delivered to OneSteel:

Safe designs and project delivery – increased safety observations in number and quality from 50 to >175/month; Improved capital planning, project selection and execution – by developing and deploying alliance processes to ensure only good projects proceed, we deferred or cancelled 35 poor projects, avoiding AUD 35 million capital expenditure by spending an additional AUD 300,000 in operating expense; High return on investment – AUD 22.4 million Net Present Value was added for an AUD 5.03 million investment in 16 projects; Easy access to best practice and benchmarking information – through reliability audit questions completed by auditors and Business Unit customers as well as accessing benchmarking information from our Best Practice Forum; Optimization of resources – the same amount of work is done by 20% fewer people, equivalent to a saving of AUD 1.8 million/year; Reduced cycle time – the 200 days reduction achieved is equivalent to AUD 20 million Net Present Value

Focus on Cost Effective Implementation of Capital Projects — Canada

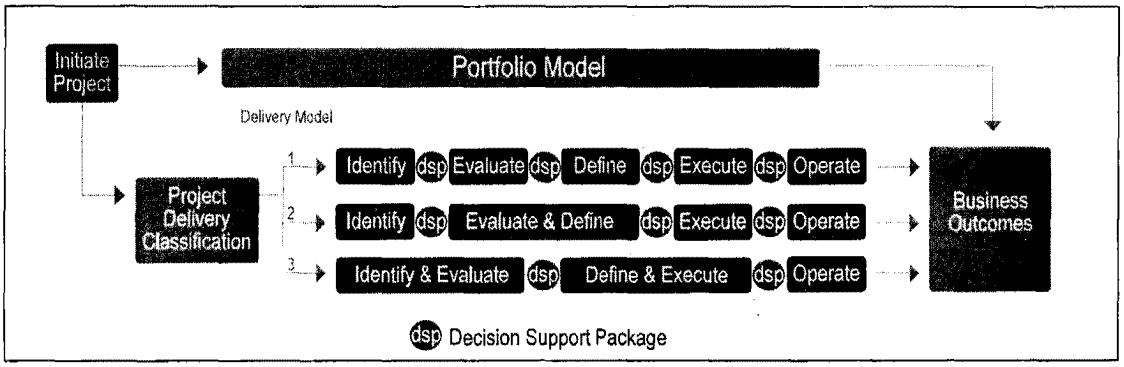


Since 1991, Talisman Energy Inc, through the Talisman Prime Relationship, has continuously engaged Colt WorleyParsons to provide engineering, procurement and construction management services for its oil and gas assets in Western Canada. The Prime Relationship's core business objective is sustained, cost effective and efficient execution of Talisman Energy's yearly North American capital project plan. The secondary objective is operational and maintenance engineering support.

Cost effective implementation of capital projects is a key component for Talisman in reaching their return on investment goals and as such, it is a key focus for our personnel on this long-term *Improve* contract. Major projects completed in recent years include: the Lynx/Palliser Sour Gas Gathering System in the foothills of the Rocky Mountains, the Musreau Gas Plant expansion; and over 200 wells tied in annually.

Project Portfolio Management

WorleyParsons *Improve* takes a portfolio approach to managing projects to assist our customers achieve their overall business objectives.



A large part of WorleyParsons *Improve* business is the development and execution of a portfolio of small to medium projects at brownfield sites. Through our 120+ *Improve* long-term performance based contracts we execute over 20,000 projects annually with a capital value of over USD 4 billion.

Our *Improve* team understands how critical sound portfolio management is to our customers' achievement of business objectives. The *Improve* systems team has invested heavily in the refinement of the *Improve* > portfolio suite of tools and processes to provide the very best portfolio management platform. This unique offering has been structured to facilitate smooth customization and integration with our customers' business processes.

With many of our *Improve* contracts each managing 200+ projects during a financial year, *Improve* > portfolio can be scaled up or down to suit all sizes and numbers of projects. The tools have been structured to allow consistent management of all activities in a portfolio of projects.

Improve > portfolio ensures overall control is maintained. *Improve* > portfolio is designed to optimize capital planning and is suitable for the full range of projects typical in brownfield environments.

Improve > portfolio enables:

- Project Prioritization
- Project Register
- Cost Control
- Estimating
- Planning
- Resource Loading
- Portfolio Reporting
- Risk Analysis

Worsley Alumina — Australia

In a recent 12 month period our Worsley Alumina Alliance in Western Australia has delivered over AUD 1.1 million in savings to Worsley across 120 projects/year ranging in value from AUD 5,000 to 15 million. The contract recently underwent its fifth Investment System Assessments (ISA) audit since 2003. We were assessed as 'Top Quintile' via the BHP Billiton ISA process for project deployment and rated as 'Organizationally Mature'. The contract has been rated by BHP Billiton as best practice in: Investment Process Owner Buy-in; Project Recognition; and Front End Loading.

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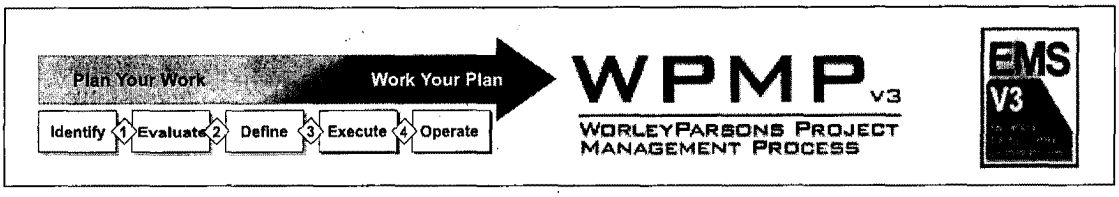
Scalable Systems

Based on the proven WorleyParsons Project Management system, tailored to suit the project portfolio environment, *Improve* has developed a scalable system that meets our customers' business objectives. Our systems and processes are designed to deliver value on a long-term basis.



The WorleyParsons Project Management Process (WPMP) is a systematic, scalable, stage gated process for supporting the development of a project's Execution Plan within a portfolio environment and is in use on all *Improve* contracts. A key function of the WPMP is to ensure projects receive a level of Front End Loading (FEL) commensurate with the level of risk (complexity), particularly during the early stages of development.

WorleyParsons Enterprise Management System (EMSV3) is a global management system that is a repository for all processes and procedures used during Definition and Execution phases across all work packages. EMSV3 ensures all project team members work in a controlled and consistent manner, regardless of the activity or location.

InControl is the primary project control and cost reporting tool for *Improve* contracts. InControl has been proven on thousands of large and small projects worldwide. The system interfaces with other WorleyParsons and customer systems.

A variety of scheduling tools are used to develop project schedules and the overall Contract Program for all phases. Their functions include: logic based networking; critical path analysis; resource scheduling; and import/ export capabilities. Linked to InControl, these tools monitor and report cost and schedule status.

In developing this suite of management systems our focus has been on providing systems which are secure, accessible by our customers and other contributors through secure links, provide real time access, and can quickly and easily be tailored to meet our customers' varying needs.

Tailored Reporting

WorleyParsons *Improve* has flexible reporting solutions which we tailor to meet our customers' specific business requirements.

WorleyParsons uses InControl to provide a variety of reports to our customers. We have an extensive library of pre-configured report templates. At contract commencement we work with our customers to tailor our reports to their requirements. The outcome is a suite of reports which have information our customers want in the format that suits their needs.

Project Work Breakdown Structure (WBS) activity codes can be used to sort, group and filter information for reporting against any specified coding convention. This allows customers to view summary information or analyze more detailed performance and forecast information for specific areas of a project or for a group of projects.

Project status reports, such as man-hour and schedule productivity, 'S' curves and histograms can be posted to the Project Control area of the Contract web site as required to enable effective decision making. All progress reports can be published directly to the Project Controls area of the Contract web site.

Tomago Aluminium — Australia

The WorleyParsons *Improve* management team worked with Tomago Aluminium to customize our reports to meet their requirements. Tomago wanted a short monthly report which focused on projects delivered rather than the alliance's overall performance. The outcome was an eight page report which provides summary information in statistical, graphical and textual formats. This provides Tomago management with a snapshot of project performance.

In contrast, the Project Controls Group at Tomago provide very detailed reporting for engineering labor costs, SAP third party costs including detailed procurement details, project status reports (traffic light reports) and project schedule reports. The systems and tools used at Tomago include Oracle, InControl, SAP, Primavera (P6), MS Access and Excel. The tools are varied and we continue to integrate and reduce the number of spreadsheets required to maintain data transfer etc.

CoSyn Alliance — Canada

WorleyParsons has developed a monthly stewardship report containing sections on: projects (including quality, schedule, and cost); human resources (including recruiting and retention information and training initiatives); procurement (including progress, trends and issues information); and engineering resources (including engineering health issues and technical issues). Other similar reports are provided by our Quality Manager, IT Manager and Technology Manager. Working closely with Syncrude, we developed a set of reports focused on the issues most relevant to their operations.

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Benchmarking

WorleyParsons *Improve* incorporates a systemized method for capturing small project performance data across sites to assist customers in project portfolio delivery.

WorleyParsons recognized the opportunity to undertake Small Project Performance reviews to capture Front End Loading (FEL) performance, key success factors and KPI metrics.

To meet this need, we have developed two assurance checklists for Project Development (Identify/Evaluate/ Define phases) and Project Execution (Execute/Operate phases). The Project Development Checklist has been implemented on a number of *Improve* contracts, each customized to the individual customers' business needs.

This systemized method of capturing small project performance data for *Improve* sites enables:

- Internal and external comparisons of performance across a variety of contracts
- Overall assessment of the performance
- The provision of benchmarking reports and continuous improvement strategies
- Best practice project delivery
- On line real time access

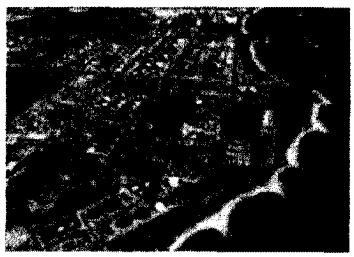
With this methodology we are able to select the best aspects of each of our *Improve* contracts to determine which elements are fundamental to an ideal execution model. This ideal model can then be compared to existing *Improve* contracts to identify areas for optimization and improvement.

OneSteel — **Australia**

WorleyParsons contract with OneSteel has delivered significant benefits since commencement in 2004. Cycle times have been reduced by 200 days, leading to an AUD 20 million increase in Net Present Value. Capital spend has also increased 50 percent and resources employed have been reduced by 40 percent. There has been a significant increase in successful projects and in FY2005/2006 over 30 of the 38 completed projects met business needs.

BP Kwinana — **Australia**

WorleyParsons contract with BP Kwinana in Western Australia has a history of project excellence with a current first quintile industry ranking. Of recent note has been a significant improvement in 'micro project delivery' (projects typically less than AUD 300,000 in value). This improvement has represented a significant saving to the customer and has transformed an historic problem area for BP into an example of how to execute micro projects efficiently and cost effectively.



Best Practice

Providing a global Best Practice Forum, WorleyParsons enables customers to share innovations and lessons learned across a diverse range of industries.

WorleyParsons identified a need to create a forum in which we could help our customers to share and resolve common issues and concerns. The Best Practice Forum was established in 2001 to provide an environment where lessons learned and innovative ideas from our business and our customers could be shared efficiently, both internally and to benefit our many customers. To supplement this, the Best Practice Network was created to bring together owner organizations from around the world, representing an increasingly diverse range of industries.

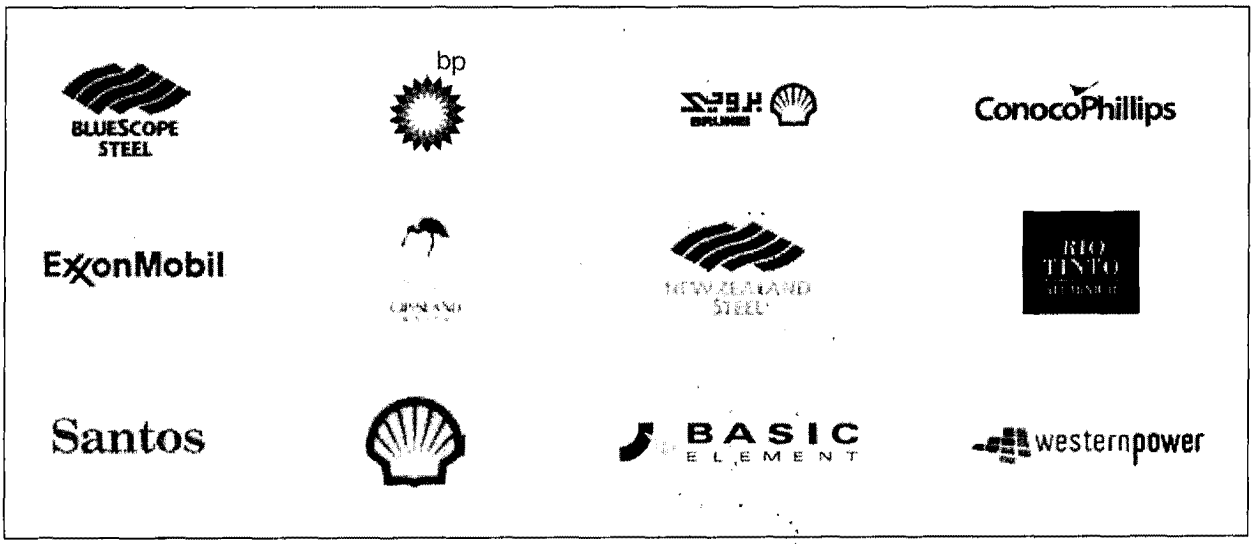
The Best Practice Forum has steadily increased in growth and globalization and is currently focused on a range of initiatives, including:

- Health and Safety
- Environment and Sustainability
- Small Projects (Portfolio Project Execution)
- Alliancing and Long-term Contract Management
- Maintenance and Reliability
- Shutdowns and Turnarounds

The Best Practice Network identifies, develops and shares leading practices to deliver safe and effective performance improvements for participating organizations. The Best Practice Network has generated value adding initiatives for our customers including:

- HSE Induction Centers
- HSE Focus Group
- Tank Maintenance Benchmarking
- Small Project Performance
- Productivity Benchmarking Using Estimating Norms

Best Practice Network Members meet and communicate on a regular basis on a wide range of initiatives such as those outlined above, and are invited to attend the annual Best Practice Forum. The Best Practice Forum is now a regular event, with the most recent session hosting 330 attendees from 81 companies from 13 countries. Customer attendees included:



EcoNomics™ Delivering Profitable Sustainability

WorleyParsons *Improve* utilizes EcoNomics™ to identify and deliver more sustainable projects, helping our customers manage the risk and respond to their rapidly changing business environment.

EcoNomics™ is WorleyParsons major service offering for customers who are concerned about improving the overall sustainability and long term profitability of their projects and operations, fully embedding environmental, social and financial sustainability in the identification, selection and delivery of Projects.

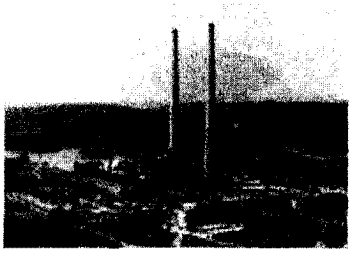
Project identification and selection integrates WorleyParsons' EcoNomics™ Assessment methodology, including our suite of proprietary assessment tools as well as our global network of leading engineering and technology capabilities. What is unique about this approach is the ability to monetize the value of all internal (project), external (environmental & social) and risk factors, allowing projects to be compared on a like for like dollar value basis. The external issues which can now be included in this detailed economic model include climate change and greenhouse gas emissions (ie price of carbon), water resource use and protection, loss of ecological diversity, social amenity and growth and a whole range of other common resources. In addition, we are able to model future changes in resource costs such as energy and water to assess the affects on project decision making.

Following project selection, WorleyParsons is able to deliver practical engineering solutions by embedding sustainability in every part of the delivery process, from risk management and value improvement, through design and into construction management and operation & maintenance. This is done with the support of our wide range of world class specialist technical capabilities which can be brought to bear on any project. The process is embedded in WorleyParsons' project management systems, and projects are delivered by an integrated project team which is empowered through the identification of sustainability targets for a project.

As it relates to *Improve* projects, EcoNomics™ enables our customers to enhance their business position through the identification of new improvement projects and through ensuring that all projects are structured to provide the best whole of business outcomes. Tangible business benefits include risk and liability reduction, improved environmental compliance outcomes, and enhanced ability to continue to operate and expand.

Hydro Aluminium — Australia

WorleyParsons was requested by Hydro Aluminium Kurri Kurri Pty Ltd (HAKK) to undertake an alternative energy feasibility study. The aim of the study was to provide Hydro management with information on the viability of renewable energy solar solutions and the impact that Government mandates will have on high energy consumers in the future. The study reviewed HAKK's opportunity to align with the Australian Government strategies in reducing greenhouse gas emissions, and identified opportunities for HAKK in the areas of public opinion; renewable energy using solar technologies to generate Renewable Energy Certificates; potential greenhouse gas reductions; and associated liability for the HAKK plant.



In addition, our study provided a comparison of various forms of solar technology, their indicative capital and operational costs, and their relative benefits. It also identified opportunities for HAKK to consider for further investigation. Our recommendation was that the business case for the investment in suitable solar technology be fully developed using a structured and comprehensive approach offered by an EcoNomics™ Assessment. Consequently WorleyParsons has been asked to prepare a proposal for a study, to the end of the identify phase, into viable alternative solar energy technologies for the establishment of a pathway project at HAKK.

HSE

WorleyParsons *Improve* specifically focuses on HSE for project delivery on sites with ongoing operations.

OneWay™ is an enterprise wide integrity management framework which lays down corporate expectations for achieving the Zero Harm vision, and in turn provides links to the policies, standards and processes that WorleyParsons aims to follow in daily operations to meet the expectations.

In striving to achieve zero harm to people, the environment and assets, the scope of OneWay™ covers much more than a conventional HSE program. It also addresses matters such as risk management, technical integrity, competency, management of change and emergency response across all sectors of WorleyParsons' business. In addition, it provides guidance on how WorleyParsons works with our joint venture partners, customers, vendors and contractors to engage them in working towards the same vision.

The OneWay™ framework comprises:

- **Vision and Scope:** the ideal outcome that WorleyParsons aspires to
- **Elements:** twelve business areas within which specific activities need to take place in order to attain the OneWay™ vision

. . . then within each Element:

- **Intent:** high level objective(s)
- **Expectations:** specific behaviors, actions and/or deliverables needed to meet the Intent
- **Guidelines:** link to the WorleyParsons policies, standards and processes via which the Expectations are met

OneWay™ is one of several distinct management programs employed by WorleyParsons to deliver superior business outcomes. These programs involve different ways of viewing the business and at times may interact or overlap. Consistency of these programs is assured in that they all work from a common suite of underlying policies, standards and processes residing within the WorleyParsons Enterprise Management System (EMSV3).

3 yrs

LWC Free at Tomago Smelter and OneSteel, Australia

3.2

Million Hours LWC Free at Saudi Aramco MPP Saudi Arabia

2.23

Million Hours LWC Free at ExxonMobil Baytown, USA

Flexibility

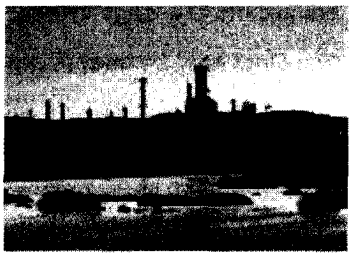
WorleyParsons *Improve* recognizes that market trends can impact our customers' priorities and focus over time, and our systems and processes can respond to deliver value on a long-term basis.

Our customers' focus can change for many reasons, such as market prices impacting on a need for increasing or decreasing production rates. WorleyParsons understands that a key to successful long-term relationships is to continually focus on delivering value to our customers and having the flexibility to work with them over the life of the contract to address their changing needs.

Our approach is to harness innovative processes and use tools to ensure we continue to add value to our customers' businesses each year. This is a core focus of *Improve* where we concentrate our effort and thought on developing, and always delivering, value to our customers.

Shell Martinez — USA

The *Improve* contract at Shell Martinez in the Bay Area of San Francisco reflects WorleyParsons' commitment to meeting the customer's requirements by bringing flexible application of resources, integration of resources and consistency of knowledge and expertise. Long-term relationships and the familiarity of our people with Shell's assets and internal systems and production requirements reduces response and mobilization times and the length of engineering process cycles, and speeds implementation. Understanding of the refinery as a whole enables a systemic approach to continuous improvement and innovation and provides the opportunity for our engineers to be engaged in end to end process problem solving and more precise project delivery.



Focus on Continuous Improvement to Deliver Value

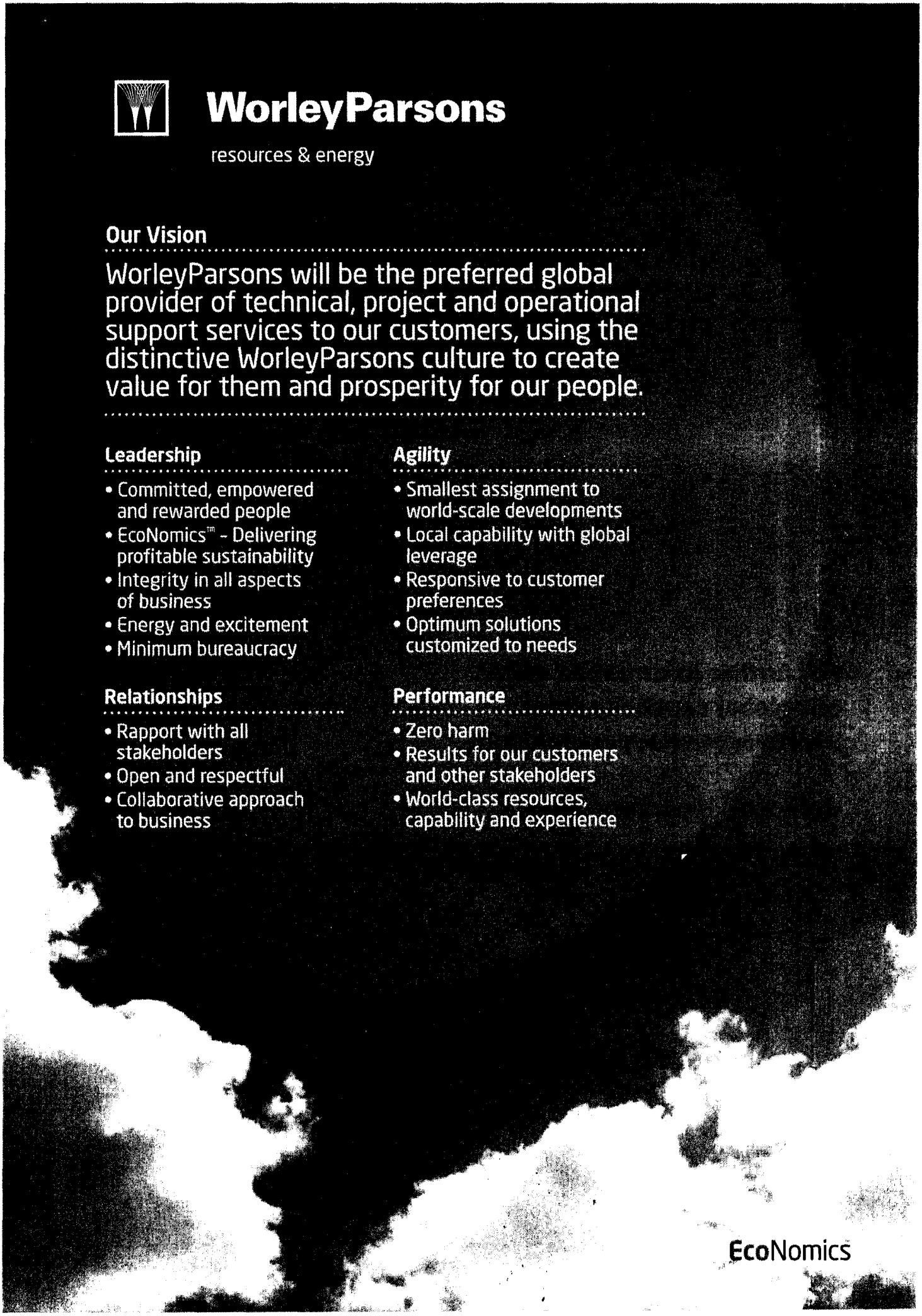
WorleyParsons *Improve* performance management process continually challenges our people to enhance and optimize our customers' assets through value-add and continuous improvement initiatives.

WorleyParsons is committed to delivering savings and value-add to our customers by focusing on continuous improvement in the way we do things.

Syncrude — Canada

For our CoSyn contract in Canada we have in place a Continuous Improvement Program called I^3 (pronounced I Cubed) which stands for Ideas, Improvements and Innovations. Through the I^3 initiative, the CoSyn team submitted CAD 160 million worth of ideas to Syncrude in 2007 of which, CAD 135 million have been accepted and signed off by the customer. Savings have included:

- Interrogating and challenging designs, which delivered total savings of CAD 25 million
- Rescheduling and reprioritizing the works program, which delivered a saving of CAD 164,000
- Various initiatives for base plant projects in 2007 resulted in savings of CAD 27.4 million
- On strategic projects for 2007, WorleyParsons delivered savings of CAD 107.8 million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Our Vision
WorleyParsons will be the preferred global provider of technical, project and operational support services to our customers, using the distinctive WorleyParsons culture to create value for them and prosperity for our people.
Leadership
• Committed, empowered and rewarded people
• EcoNomics™ - Delivering profitable sustainability
• Integrity in all aspects of business
• Energy and excitement
• Minimum bureaucracy
Agility
• Smallest assignment to world-scale developments
• Local capability with global leverage
• Responsive to customer preferences
• Optimum solutions customized to needs
Relationships
• Rapport with all stakeholders
• Open and respectful
• Collaborative approach to business
Performance
• Zero harm
• Results for our customers and other stakeholders
• World-class resources, capability and experience
EcoNomics

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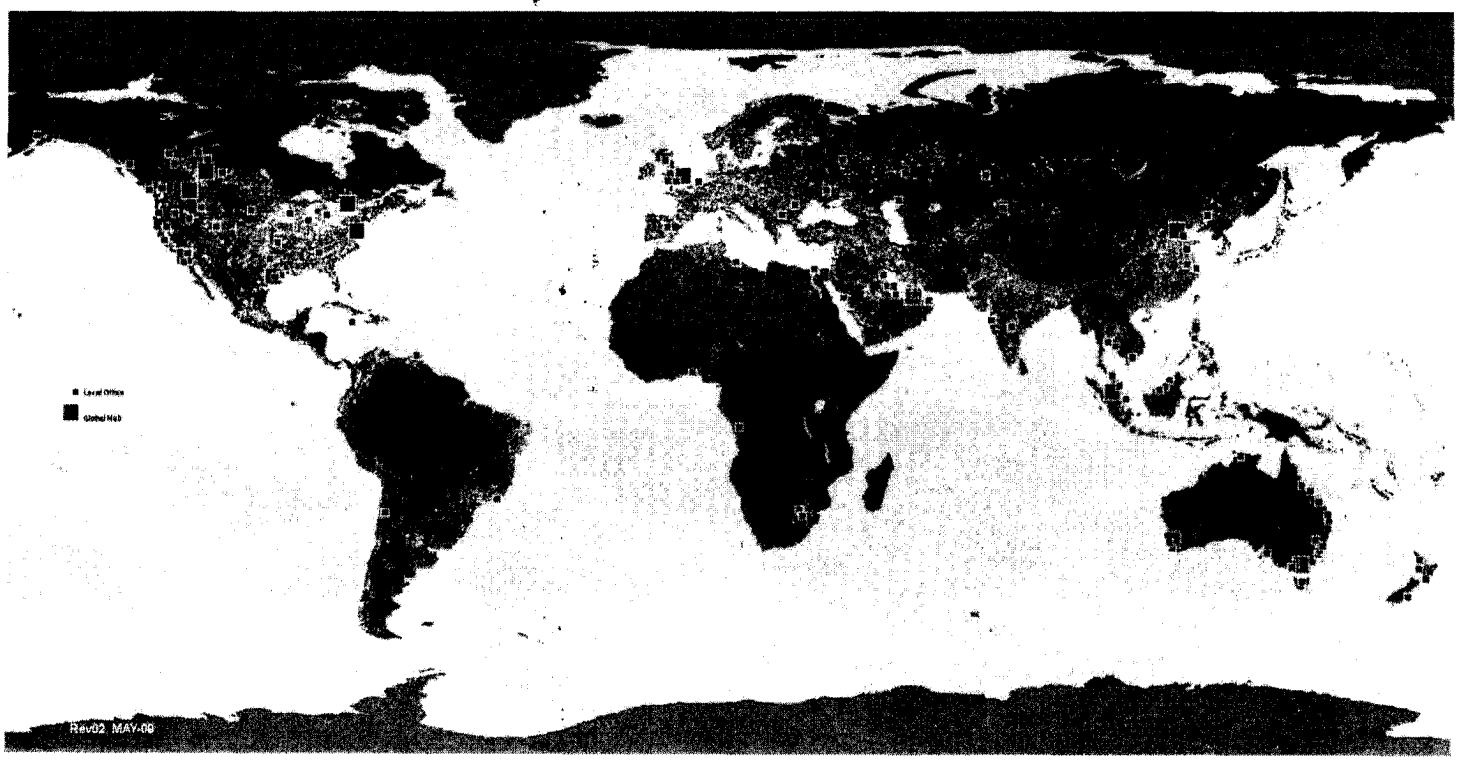
For further information about our global capability email:
improve@worleyparsons.com

www.worleyparsons.com



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EcoNomics

Specialty Services

Global Pipeline Systems

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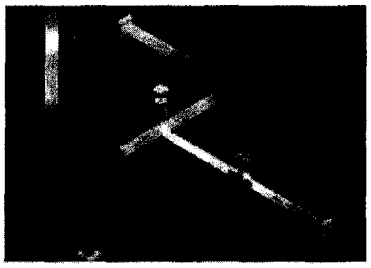
Specialty Services Overview

Over 30 years of experience working on every conceivable type of pipeline system has allowed WorleyParsons to develop knowledge within a number of key pipeline specialty areas. This expertise enables our staff to assist customers tackle the full spectrum of design issues in the industry today both within and expanding on conventional designs.

To further enhance our capabilities, WorleyParsons has focused teams of specialists that share knowledge and collaborate to enable us to address a customer's technical issues with industry leading expertise and fit-for-purpose solutions at any stage of the project life cycle, conceptual to abandonment.

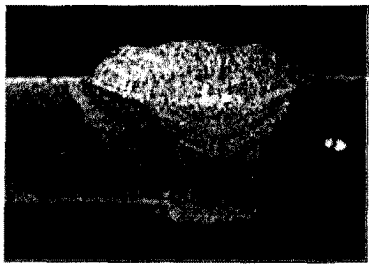
Stress Analysis



WorleyParsons has brought together a dedicated team that offers stress analysis and design services in the following areas:

- Buried and aboveground pipelines using industry standard AutoPIPE™, PIPLIN™, and CAESAR II™ software
- Pipeline assemblies such as pig traps, block valves, tie-ins, etc.
- Pump and compressor stations, including pulsation analysis
- Road and railroad crossings, line lowering, HDD
- Comprehensive non-linear pipeline stress analysis for difficult to model conditions such as high operating temperature pipelines in muskeg and Arctic terrain subject to frost heave and thaw settlement

Materials & Pipeline Design



WorleyParsons employs pioneers of strain-based limit state pipeline designers who have extensive knowledge in material development, selection and specification, and pipeline design associated with conventional pipelines and the strain-based limit states design sometimes required for Alberta Oil-Sands and Arctic pipeline systems.

WorleyParsons has extensive knowledge of pipe, valve and fittings manufacturing processes and vendors. Using this knowledge, WorleyParsons can optimize material component (pipe, valves, fittings, flanges and induction bends) specifications to suit the client needs and reduce material and construction costs.

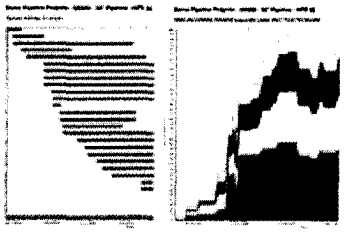
Flow Assurance

WorleyParsons has specialists using industry-specific software such as OLGA™, Stopper Pipeline Simulator™, Pipeflo™, PipePhase™, and Pipeline Studio™ to perform detailed hydraulic evaluations which include:

- Analysis and modeling of fluid properties, fluid characterization and fluid phase behaviors
- Single and multi-phase flow with natural gas, bitumen and live crude oils, miscible fluids, water and steam, chemicals, froth and tailing slurries, and other non-Newtonian fluids
- Flow system hydraulic analysis, flow assurance, system debottlenecking and production optimization, including batch sequencing
- Steady-state and transient flow studies in the wellbore, gathering systems, plant piping and transportation pipeline systems
- Pipeline and pump/compressor station capacity and pipeline sizing studies, station location evaluations and capacity enhancement studies
- Pipeline system-wide simulation including SCADA control system, station local controls and various control devices for operational safety
- Pipeline decompression analysis, leak detection, spill response planning, and pressure surge/ hammer studies

Cost Estimating

WorleyParsons is able to provide estimates from screening level/Class 5 estimates to Class 1 estimates under AACE guidelines or client specific parameters. Estimates can be prepared using a number of different techniques, from factoring and rule of thumb, all the way to "bottom up", line item materials and crew-based costs. WorleyParsons has developed a proprietary Pipeline Cost Estimating System (PiCES™) which is designed to organize, calculate, summarize, and report project specific conditions, assumptions and cost information. Construction estimates are based on current, location specific labour and equipment rates with input from experienced construction planners and system specialists. The PiCES program details specific crew operations, productivity rates, resource loading, construction schedules, terrain and weather conditions and numerous other factors that are used to calculate the costs for such activities.



Welding & NDE

The WorleyParsons welding/NDE team includes experts in manual and mechanized welding, X-ray and gamma radiography, plus ultrasonic inspection. This expertise is applied in the following services:

- Welding and NDE reports on process and techniques applicable to project requirements and limit state designs.
- Welding and NDE procedure specification; research, review, development and qualification.
- Welding and NDE research and development including high strength materials and strain based design requirements.
- Assessment of a material's fabrication ability with available welding process choice and techniques.
- Development of mechanized welding techniques including narrow groove GMAW and standard bevel FCAW process techniques
- Field-level inspection or audit of welding and NDE

Trenchless Crossing Design

On any pipeline project one of the more critical aspects is the need for trenchless crossings for watercourses, railways, roads and pipelines. These trenchless crossing include a number of different construction techniques such as horizontal directional drilling, horizontal directional boring, slip boring, guided auger boring as well as others. Each of these crossings will end up being designed separately. Each will require design drawings meeting the requirements of the utility being crossed for permit applications as well as for construction. Whether the pipeline is an NPS 6 or NPS 48, WorleyParsons has the in-house engineering capabilities to carry these from preliminary engineering through to construction.

Geomatics

Specializing in Geographic Information Systems (GIS) analysis, spatial data management, automated alignment sheet generation, 3D visualization and remote sensing applications, WorleyParsons is on the leading edge of the application of geomatics to pipeline and other linear engineering and environmental projects.

- Pre-design support, including the acquisition of satellite, and aerial, imagery and LiDAR, spatial data management, cartography and web mapping, terrain modeling, and field study support including GPS field kits.
- Design support including GIS analysis for slopes, crossings etc. Developing spatial tools to assist geotechnical and environmental engineers, and semi-automated alignment sheet generation
- Regulatory support including web portals, and cartography for public outreach
- Operations support. Web-based integrity management systems. Conversion of design and as-built data into client-specified operational databases

Pipeline & Asset Integrity

WorleyParsons Pipeline & Asset Integrity can develop the optimum integrity program for a Customer addressing due diligence, audits, program development and program implementation. Our integrity specialists and in-house discipline skill can supplement existing Customer integrity teams or execute a turn-key program from concept to completion. For new projects, WorleyParsons can assist a Customer in designing for risk, to maximize long term performance. For existing projects, WorleyParsons can assess, monitor and mitigate to establish a long term integrity management program.

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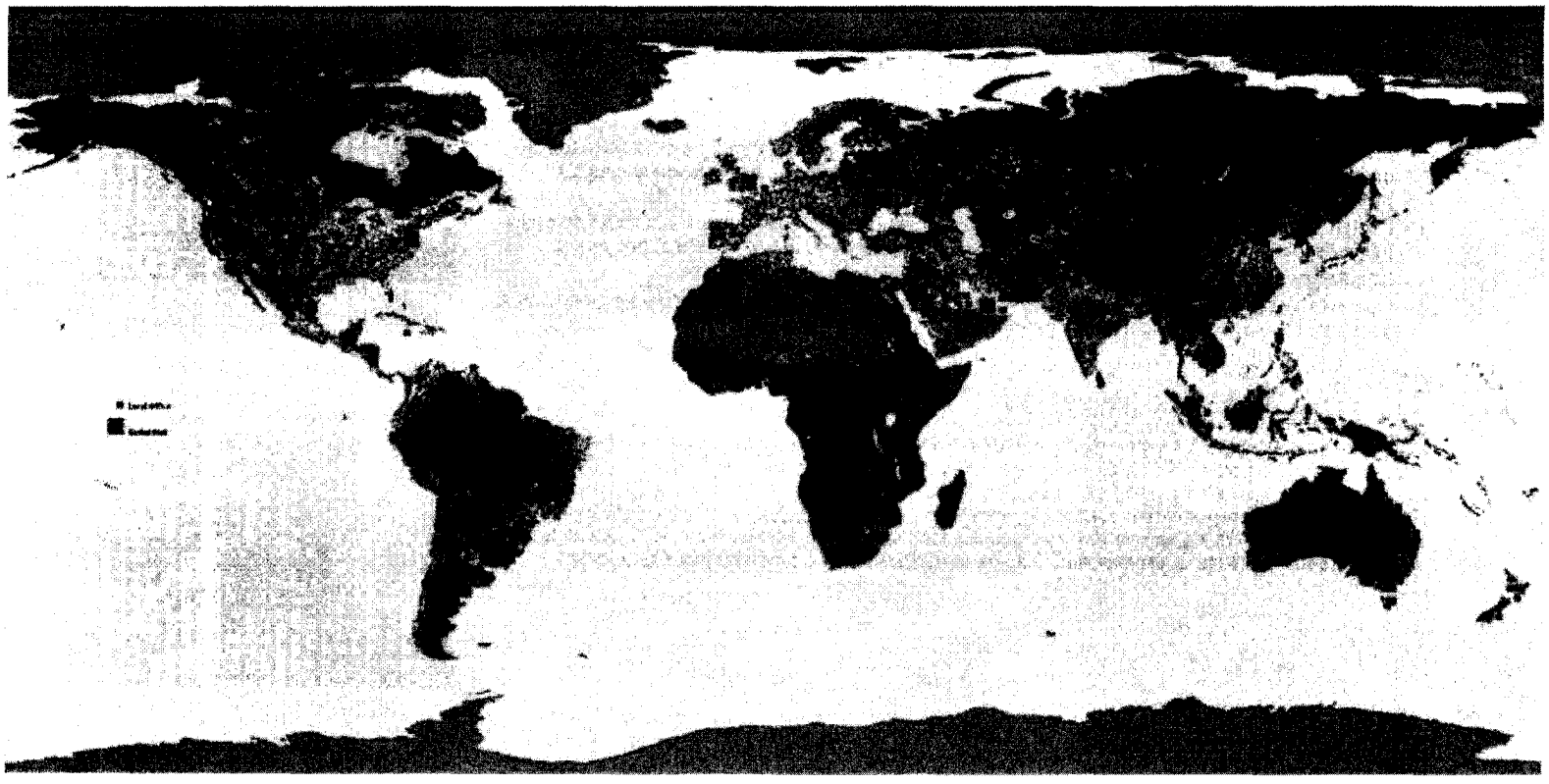
For further information about our global capability email:
pipelines@worleyparsons.com

www.worleyparsons.com



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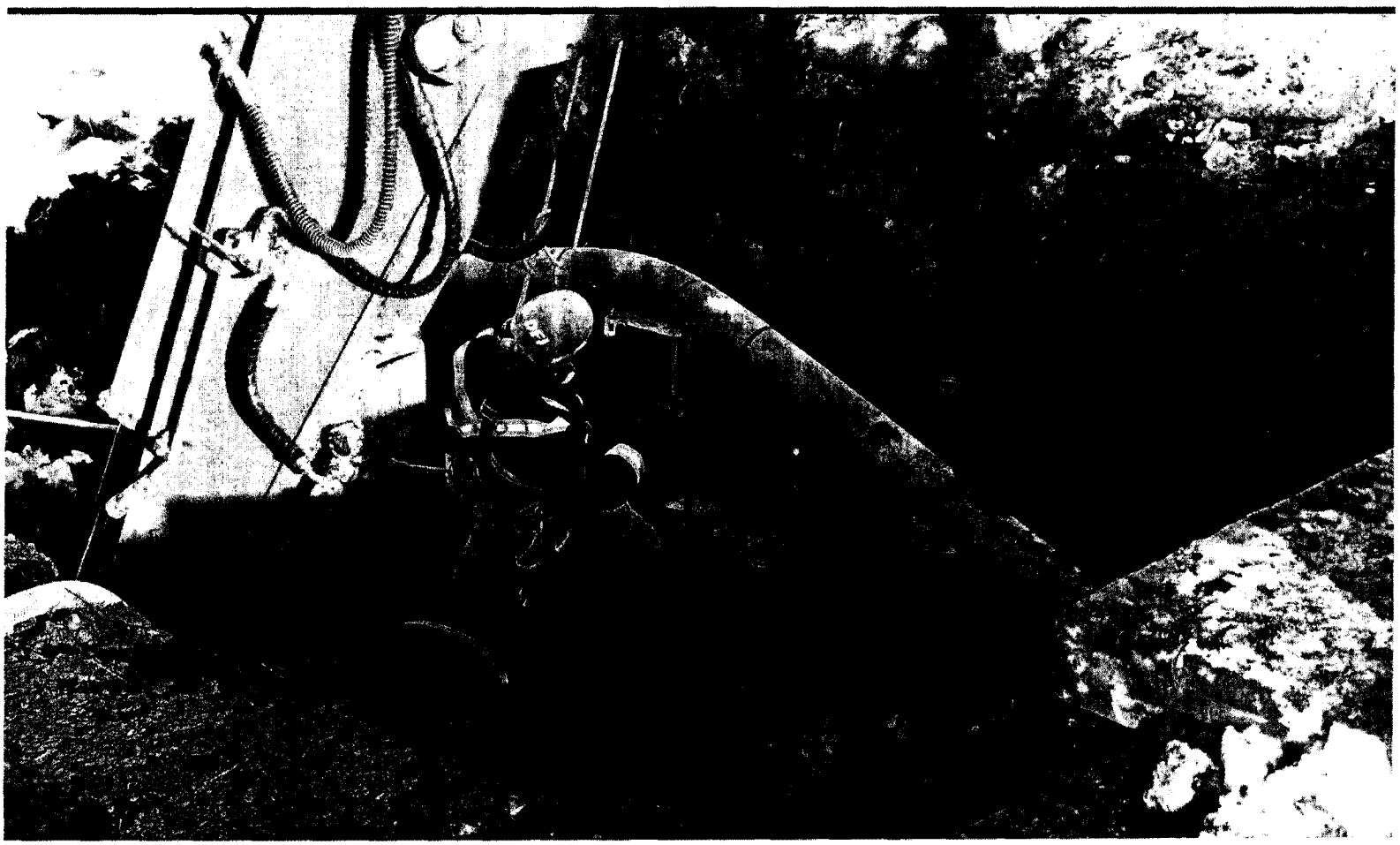
Pipeline Integrity

Capability Overview



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Capability Overview

Fitness For Service/Engineering Assessments

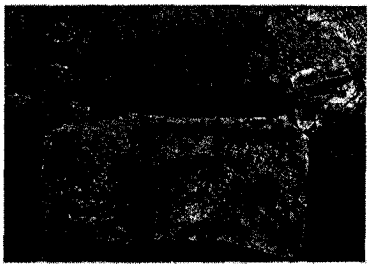
Fitness for service and engineering assessments of pipelines, piping facilities, storage tanks and pressure vessels are performed either as an independent activity, or as part of an engineering assessment. The assessments help to determine whether an asset can be re-rated for safe use in service, or must be repaired, retired or replaced. Fitness for Service assessments are performed based on the guidelines given in the standard API 579-1/ASME FFS-1 2007 Fitness For Service, and other relevant ASME, API and CSA codes and standards.

Risk Assessment

WorleyParsons employs a generic ranking model to prioritize risk in the pipeline system. This model includes identifying potential events and conditions that could threaten system integrity and evaluating the probability and consequences of failure. The resulting output is a numeric comparison of the risk in each pipeline segment. This numeric value is then compared with the historical experience of the operator to confirm that the input parameters provide a reasonable presentation of risk.

Corrosion Control Coatings

WorleyParsons has expertise in external corrosion control methods for buried or submerged metallic structures through a combination of protective coatings and cathodic protection, where applicable. This expertise permits the coating selection for pipelines, tanks, pressure vessels, and structural steels for below-ground, above-ground, and marine applications to be optimized. Our experience includes knowledge of coating performance and suitability for both soil and immersion service in ambient and elevated temperature situations as well as coating performance under cathodic protection electrical stresses.



Cathodic Protection

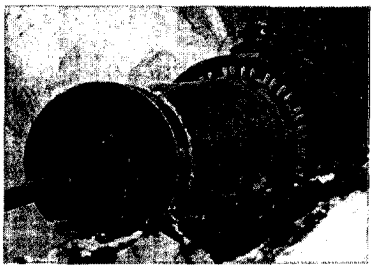
WorleyParsons provides engineering services for cathodic protection (CP) projects related to pipelines and facilities. These services include conceptual, basic and detailed CP designs, budget estimates and the preparation of work packages for new structures. For existing structures, CP system performance evaluations, and CP design services, budgeting and preparation of work packages can be provided.

Metallic Materials

WorleyParsons has extensive experience in the selection of metallic materials for line pipe, pipeline components (valves, flanges and fittings) and specialty piping systems in corrosive service. Expertise includes dealing with metallic sour service materials and the mitigation of environmentally assisted cracking processes (sulphide stress cracking, stress corrosion cracking, hydrogen charging and caustic stress corrosion cracking).

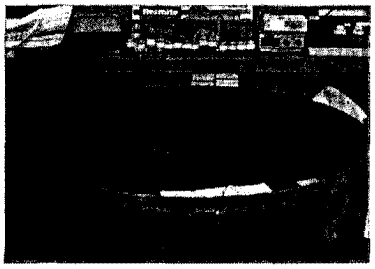
Non-metallic Materials

WorleyParsons can assist in the design and selection of materials for corrosive service using polymeric materials, including reinforced plastics. This non-metallic expertise extends to the selection of polymeric sealing materials (e.g. flange gaskets and valve seals) for high performance service applications. An extension of non-metallic materials experience is the ability to integrate composite repairs for pressure containment into the integrity cycle. This includes the design, review, and qualification of the selected repair method and materials.



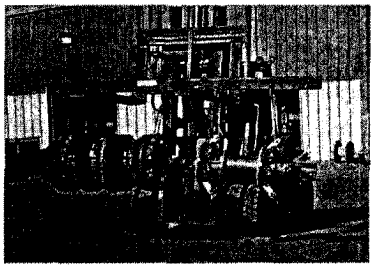
Internal Corrosion Control

WorleyParsons has experience in the assessment, mitigation and monitoring of internal corrosion for new and existing pipelines and facilities. Assessment requires the review of attributes, design and construction features, operational processes and history and any internal corrosion programs. Mitigation considers removal of corrosive constituents, chemical treatment and internal coatings or linings. Monitoring may include recommendations for type(s) and placement of intrusive monitoring devices, non-intrusive physical methods, sampling and chemical analyses and visual inspection.



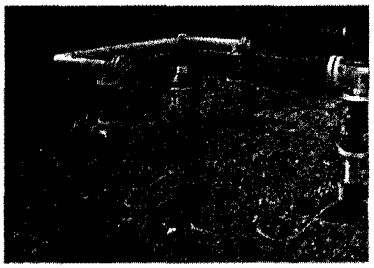
In-Line Inspection Assistance

WorleyParsons offers specialty pipeline services for in-line inspection program development, implementation and program management. Our engineers can assist with tool selection, to provide the desired inspection results, and offer enhanced assessment of inspection results for corrosion growth rates, fitness for service and probability of exceedence. The assessment information can assist in the development of remediation programs, repair prioritization, and optimized inspection frequencies.



High Voltage AC Mitigation

The design of a pipeline in close proximity to AC power lines must consider induced AC voltages and elevated ground voltages and their impact on personnel safety and pipeline integrity in accordance with regulatory codes. WorleyParsons offers detailed analysis using advanced computer tools to model the soil structures and to calculate the envelopes of the total interference stresses (inductive, capacitive, and conductive coupling) along the right-of-way under both steady state and fault conditions.



Integrity Management Programs

WorleyParsons can develop Integrity Management Programs that ensure compliance with the regulatory requirements for pipeline and facility owners and operators. Capability includes corrosion and integrity audits to determine if an operator is meeting the requirements of applicable codes and standards (e.g. CSA, API and ASME, and the regulatory requirements of Canada and the USA).

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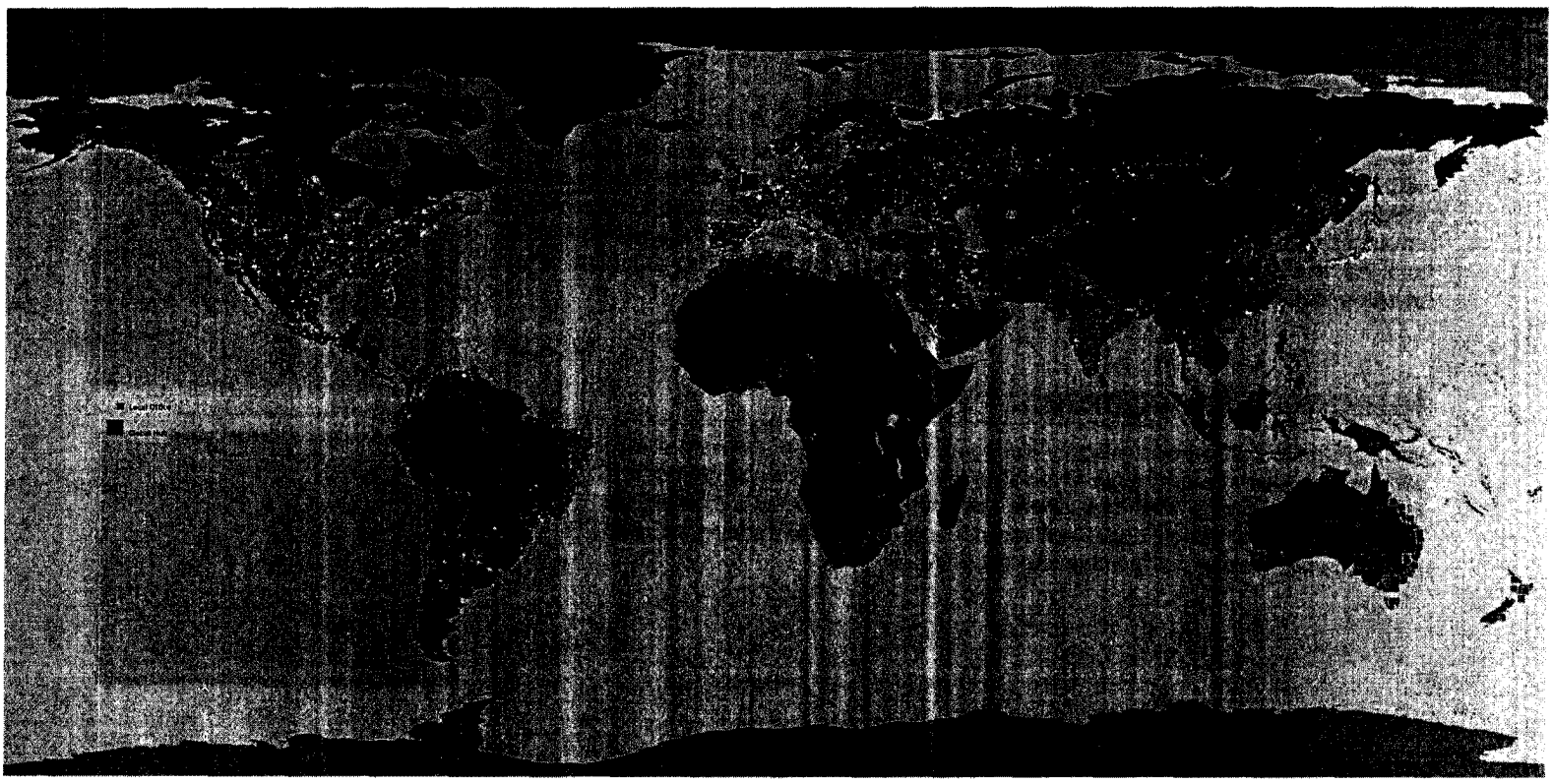
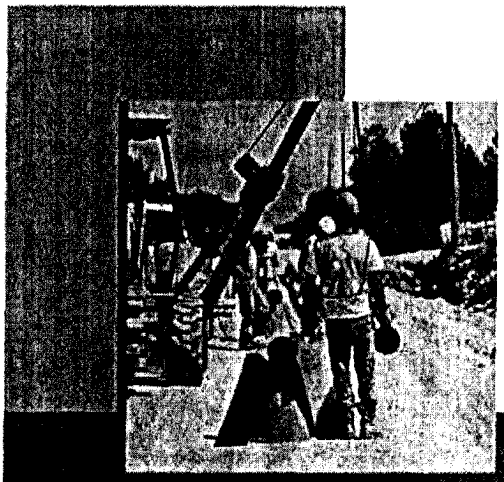
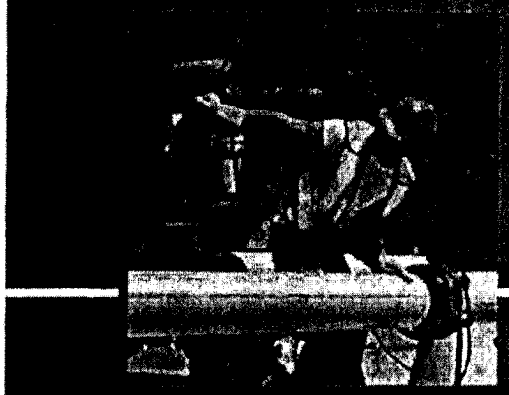
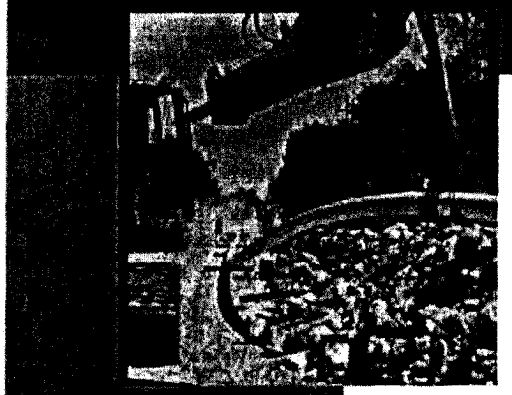
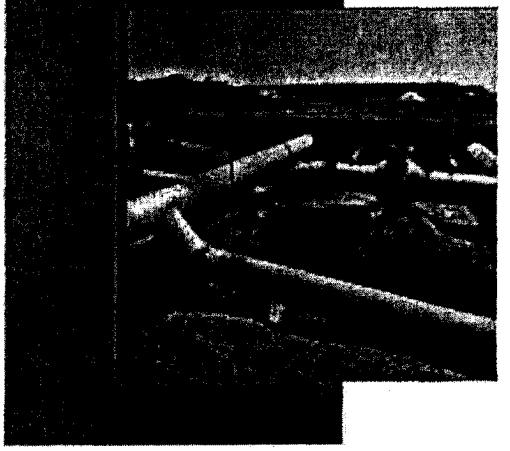










AECON UTILITY ENGINEERING
NATURAL RESOURCE GAS LTD

PROPOSAL FOR DEVELOPMENT OF PIPELINE MAINTENANCE PROTOCOL

MARCH 18, 2011

AUE
Utility Engineering

AUE
Utility Engineering

A Division of
Aecon Construction Group Inc.
20 Carlson Court
Suite 800
Toronto, Ontario M9W 7K6 Canada
Tel (416) 297-2600
Fax (416) 940-2285

March 18, 2011

Mr. Jack Howley, P.Eng.
General Manager
Natural Resource Gas Limited
39 Beech Street East
Aylmer, Ontario
N5H 1A1

RE: Request for Proposal For an Independent Expert to Develop a Maintenance Protocol for a Natural Gas Pipeline in the Municipality of Thames Centre, Township of Malahide and Aylmer, Ontario

Dear Mr. Howley

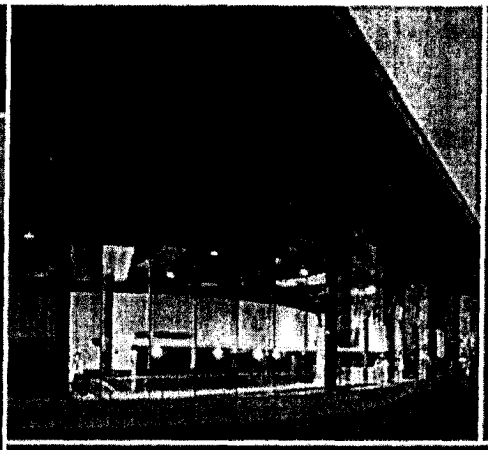
Thank you for providing us the opportunity to submit to Natural Resource Gas Limited ("NRG") our proposal for the development of a Maintenance Protocol for the Ethanol Pipeline located in the Municipality Thames Centre, Township of Malahide and Town of Aylmer, Ontario.

We trust this proposal meets your requirements. We thank you for the opportunity to submit this proposal and look forward to working with you on this project. If you have any further questions, or if additional information is required, please contact the undersigned.

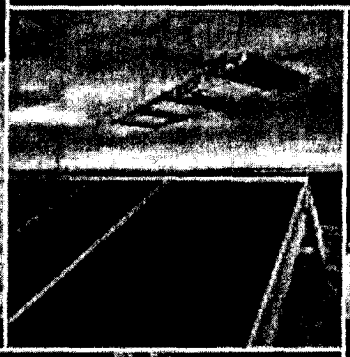
Yours truly,

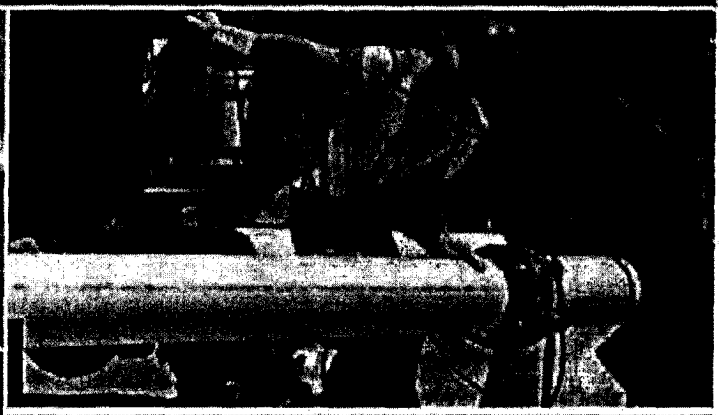
Aecon Utility Engineering

■ **ANDREW GEDEN** // GENERAL MANAGER, AECON UTILITY ENGINEERING
Office 416.297.2600 // Cell 416.428.7125 // Fax 416.940.2283 // Aecon Infrastructure // www.aecon.com



QUALIFICATIONS , PROJECT TEAM AND CORPORATE BACKGROUND





MARCH 18, 2011

Qualifications of Project Team and Corporate Background

The Aecon Utility Engineering Team (AUE) has a strong and diverse background in both the design and management of natural gas distribution and transmission pipelines and facilities.

Aecon Utility Engineering (AUE)

AUE was initially formed in 2005, in order to meet the growing needs in the gas industry, to supply design services to the gas utility market and support key gas distribution clients. Since 2005, we have continued to grow in size and scope, now offering design services for all types of utilities, gas, hydro, and telecommunications. Capabilities include full engineering services on new construction, network expansion and modernization, system maintenance, and rehabilitation and restoration.

Our Main Lines of Business are:

- Gas Pipelines
- Electrical Systems
- Telecommunications
- Directional Drilling
- Project Management
- QMS Systems

AUE offers complete design services including preliminary design, detailed design, project management, and contract administration services. Our design team is experienced in projects of various scopes. We offer the following services:

- Project timelines
- Route selection
- Feasibility & cost studies
- Easement acquisition
- Running line acquisition support
- Permits
- Municipal consent liaison
- Road condition surveys
- Technical support for environmental assessment

Design

- Detailed network design to CSA & TSSA
- codes and standards
- Directional drilling feasibility studies
- Material procurement details
- Constructability reviews
- Mapping and GIS services
- "As Constructed" CAD design services

Specifics vary from utility job to job, however, overall design parameters remain consistent. We adhere to a 4-phase process approach to design services. They are as follows:

- Phase 1 – Base Plan Development
- Phase 2 – Posting of all Utility Info to Base Plans
- Phase 3 – New Plant Detailed Design
- Phase 4 – Design Approval & Client Sign Off

In addition, our AUE team supports Quality Assurance initiatives across the entire Civil and Utilities organization. Acting as an independent third party, they are able to administer the company's QMS policies and practices. This QMS plan is inherent to all projects undertaken by Aecon Infrastructure.

Project Team

AUE has carefully chosen a proposed project team made up of key individuals whose backgrounds, technical knowledge, and industry experience offer NRG the best value and delivery of this important tender as an independent expert. The project team offers a combined 150 years of natural gas pipeline and facility construction, operation, and maintenance experience. The nominated key personnel for the development of the Pipeline Maintenance Protocol would include (but not be limited to) the following team members:

Anthony Chan, P. Eng. – Senior Project Engineer

Mr. Chan is a Senior Project Engineer with over 25 years of strong project management, engineering and design as well as operational and system planning experience of both natural gas distribution and transmission pipeline systems and facilities.

Grant Strachan, P. Eng. – Manager, Engineering

Mr. Strachan has over 15 years of engineering design and management experience in the utility industry. A pipeline specialist, he is responsible for the operation of the engineering design team and will be responsible for the review and approval of all engineering drawings. Mr. Strachan is considered a subject matter expert in the field of HDD and pipeline design.

Jim Patterson, CTT (Certified Technical Trainer)

Mr. Patterson has over 39 years field experience in several technical roles directly related to pipeline construction and maintenance activities. With extensive experience as a Pipeline Inspector on pipeline construction projects in Ontario and Nova Scotia in addition to a number of years as a Technical Trainer for a distribution utility company he has significant general knowledge of pipeline operations with specific expertise relative to plastic fusion and stopping & tapping operations. For the last two years he has worked as a private consultant to the natural gas industry writing technical procedures and providing training services.

Ted Fitzmorris, CTT (Certified Technical Trainer)

Mr. Fitzmorris has over 37 years experience in several technical roles directly related to pipeline construction and maintenance activities. With a background in field operations, utility front line supervision, technical training and management of technical training staff and facilities he has specific experience with planning and implementation of new projects and process development. For the last two years he has worked as a private consultant to the natural gas industry developing training programs, competency assessment plans and providing training services.

Jett Janczak, E.I.T. – Manager, Special Projects

Mr. Janczak is an E.I.T. with over four years of experience in the design and management of natural gas, oil, and propane pipelines and stations as well as the design and coordination of electrical, telecommunications, and Municipal infrastructure.

Garry Keating, C. Tech. – Survey Lead & Sr. CAD Technician

Mr. Keating is a Sr. Technician for Aecon Utility Engineering and has over 25 years of experience in design drafting, surveying, mapping, drafting, GIS development and project coordination for a wide range of projects including natural gas pipelines, hydro corridors, railways and land development.

Lucas Rastelli, C. Tech. – CAD Technician

Mr. Rastelli is an Engineering-CAD Technician for Aecon Utility Engineering and is responsible for the creation and revision of electrical, civil, schematic, and rail crossing drawings according to designer's specifications; gathering site information for utility designs; and interacting with clients and designers to accommodate changes during the design phase. He has over 6 years of experience using CAD software and over 3 years of experience working with utility drawings as an Engineering-CAD Technician.

Aecon Group Inc

More than 100 years of Building Things That Matter

For over a century, Aecon and our predecessor companies have helped build many of Canada's most famous infrastructure landmarks – from the CN Tower and the St. Lawrence Seaway, to the Calgary Olympic Oval and the Halifax Shipyards. But, perhaps more importantly, we've helped build hundreds of factories, roads, sewers, theatres, book stores, power plants, paint shops, arts centres, offices, hotels and gas distribution networks (to name a few) that aren't so famous.

As the largest publicly traded construction and infrastructure development company in Canada, our expertise covers the full range of services, including design and construction, financing, operating, procurement and project management.

Aecon's record for innovation and our ability to handle complex construction challenges is matched by our commitment to quality and safety. Aligning these elements is what drives us to constantly find new ways to bring added value to our clients across the country and around the world.

We have earned our reputation for industry leadership in civil, buildings, industrial, mechanical, nuclear and utility construction. Aecon is pleased to be recognized as one of the 50 Best Employers in Canada as published by Report on Business Magazine.

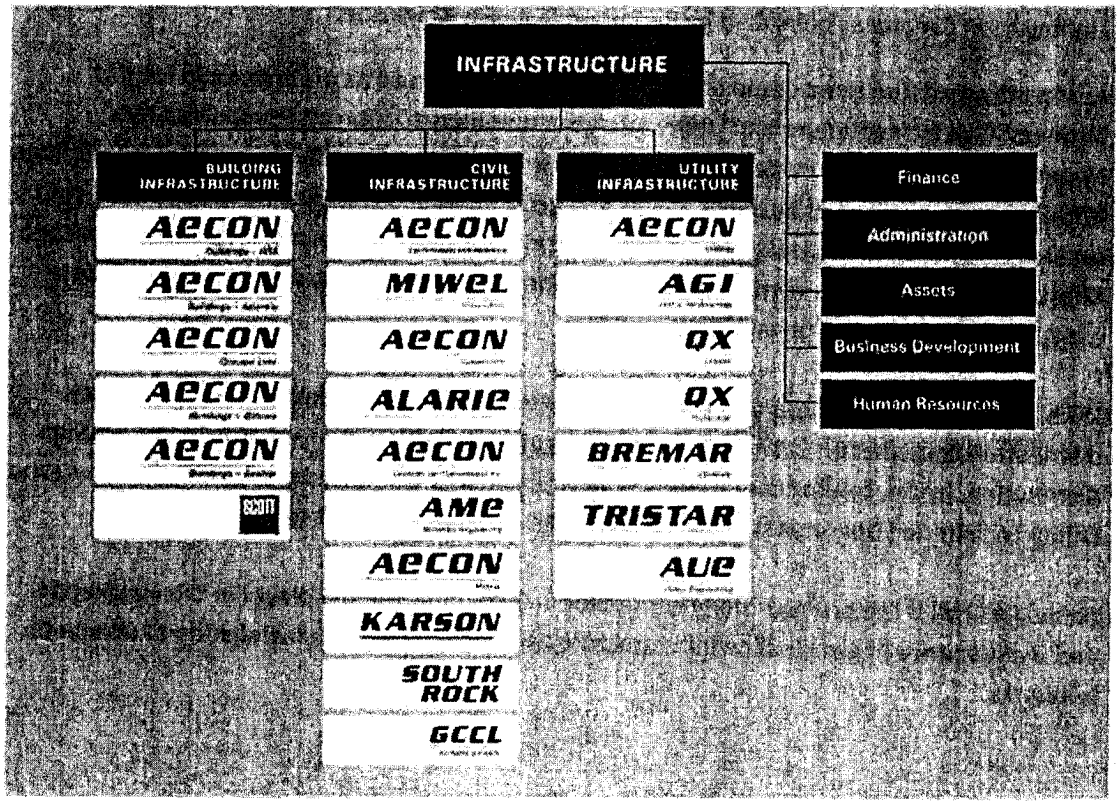
Aecon Infrastructure is a division of Aecon Group Inc., and consists of three main lines of business: Civil Infrastructure and Utility Infrastructure Construction and supported by a Materials Division that provides aggregate and asphalt to the other divisions and public at large. Within these main lines of business are several geographic and specialty business units. From smaller infrastructure projects to complex civil construction assignments, Aecon Infrastructure offers seamless solutions in energy, transportation, communications, dams and tunnels to a wide range of public and private sector clients.

With respect to the activities of Aecon Utilities, Aecon Utilities, we have been in the utility distribution construction business since 1957, providing construction services to the pipeline distribution, hydro, telecommunication, water, sewer, and traffic technology industries. Aecon Utility Engineering operates stand alone although in full compliment to Aecon Utilities.

Aecon Utilities is the premier utility contractor in Ontario, and a key player in the installation and maintenance of gas pipeline infrastructure, with expertise in the installation of complete networks.

Aecon Infrastructure

Below is a chart of the various autonomous Business Units that fall under Aecon's Infrastructure Group. Aecon Utility Engineering (AUE) is the design arm of our Utility Infrastructure business units:



50 BEST EMPLOYERS IN CANADA 2008

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AECON UTILITY ENGINEERING



INNOVATIVE SOLUTIONS IN UTILITY ENGINEERING AND DESIGN

ELECTRICAL SYSTEMS
GAS PIPELINES
TELECOMMUNICATIONS
DIRECTIONAL DRILLING
PROJECT MANAGEMENT
QMS SYSTEMS

AUE offers complete design services including preliminary design, detailed design, project management, and contract administration services. Our design team is experienced in projects of various scopes. We offer the following services:

Project Management
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Design
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In addition, our AUE team supports Quality Assurance initiatives across the entire Civil and Utilities organization. Acting as an independent third party, they are able to administer the company's QMS policies and practices. This QMS plan is inherent to all projects undertaken by Aecon Infrastructure. It's what we do, it's who we are.

Aecon Infrastructure Group
20 Carlson Court, Suite 800
Toronto, Ontario Canada
M9W 7K6

Phone: 416 297 2600

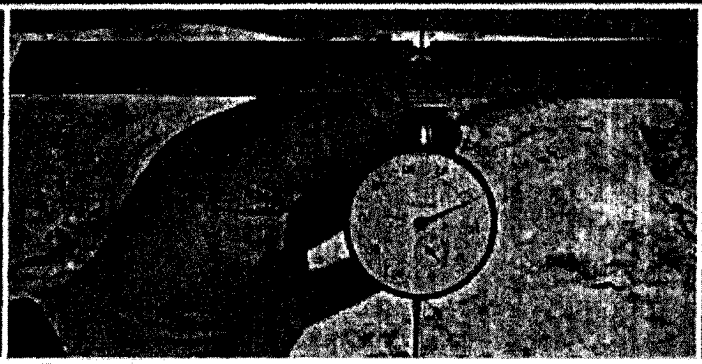
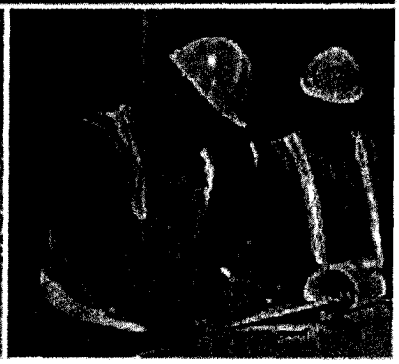
www.aecon.com

AUE
Utility Engineering

AUE supports our Aecon Utilities business with the development and administration of Quality Management Systems. We work with our clients to develop QMS programs that meet client expectations for quality installation, management and reporting.

AUE acts at arms length from the operation teams to provide integrity and accuracy of the QMS programs.

AECON UTILITY ENGINEERING

QUALITY MANAGEMENT SYSTEMS (QMS)

QMS DESIGN
QMS TRAINING
QMS INSPECTION
QMS REPORTING

AUE offers a complete QMS program for our clients to ensure ongoing quality of service provided by our Aecon Utilities Group.

Staffed by certified QMS experts and supported by QA inspectors, the QMS team with Aecon Infrastructure works closely with our clients and our operational teams to ensure comprehensive QMS program development, and adherence to the programs.

Such program development and management includes, but is not limited, to the:

- QMS System Development
  — Quality Manual, Documentation, & Records Control
- Management Roles and Responsibility
  — Quality Policy
- Planning & Objective Setting
  — Responsibility, Authority, & Communication
- Resource Management
  — Resource Planning, Competence, Awareness, & Training
- Program Development
  — Client Requirements, System Design & Development
- Measurement, Analysis, Improvement
  — Monitoring, Conforming, Correction, Improvement

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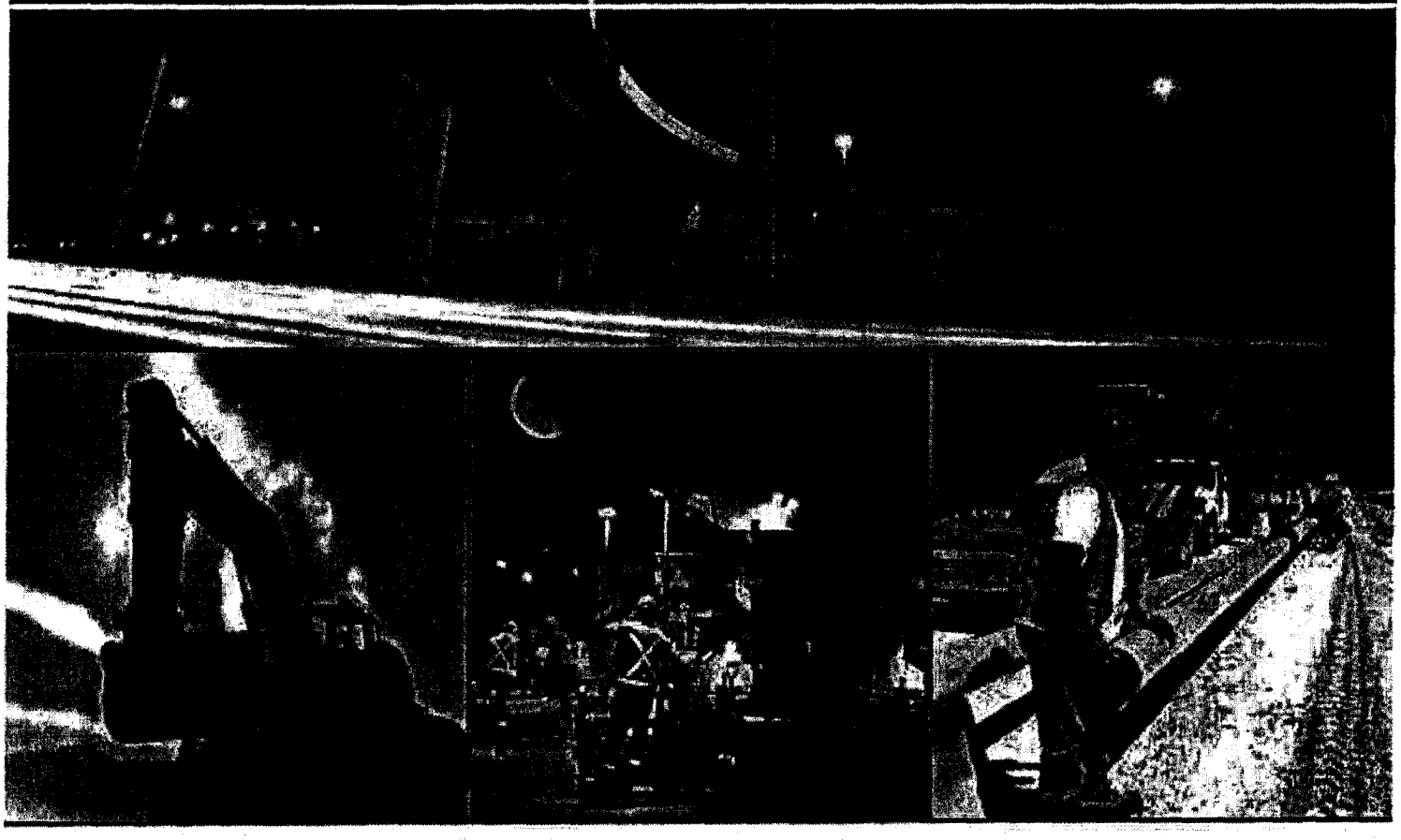
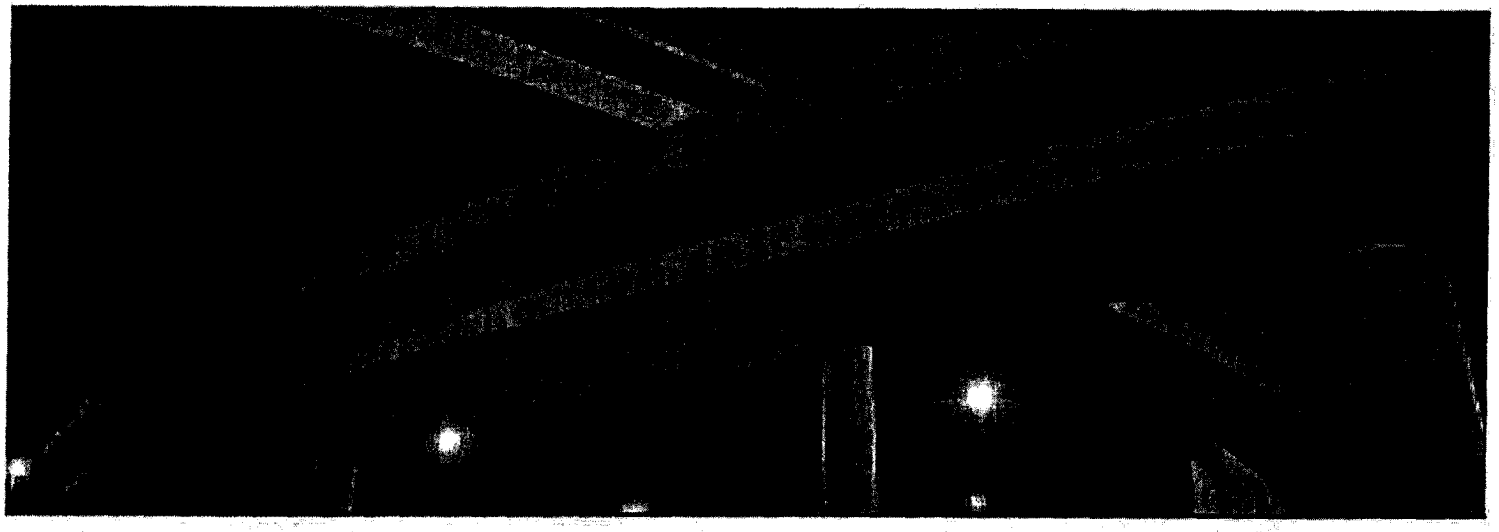
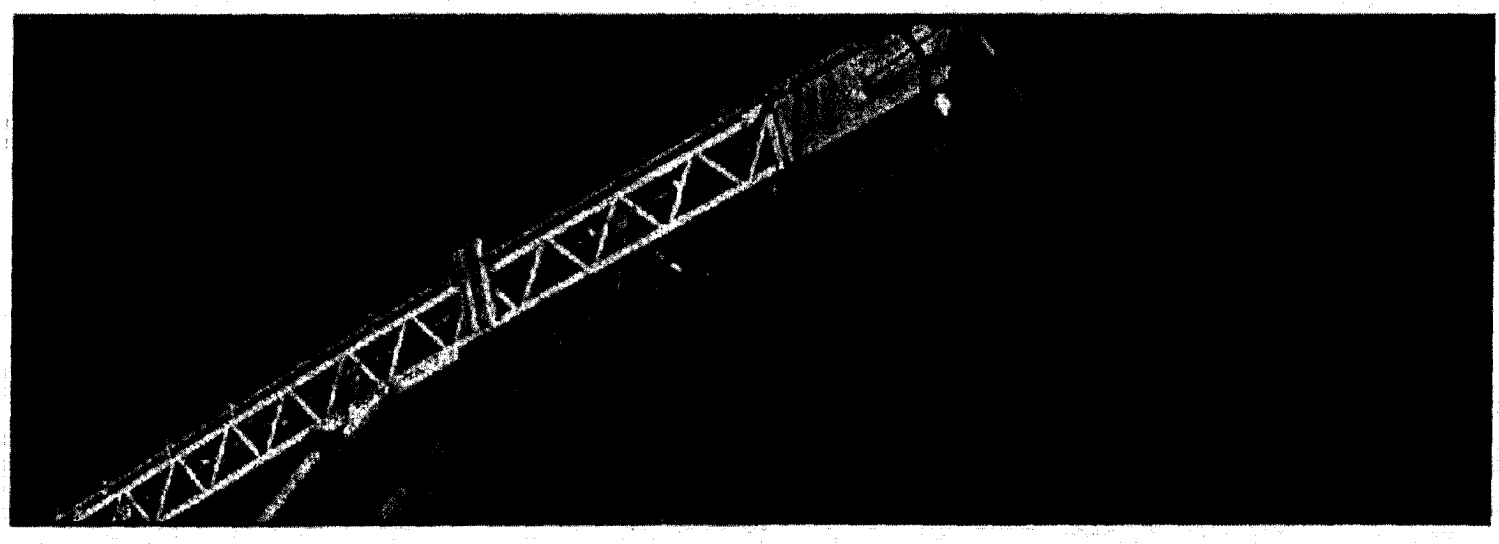
AUE
Utility Engineering

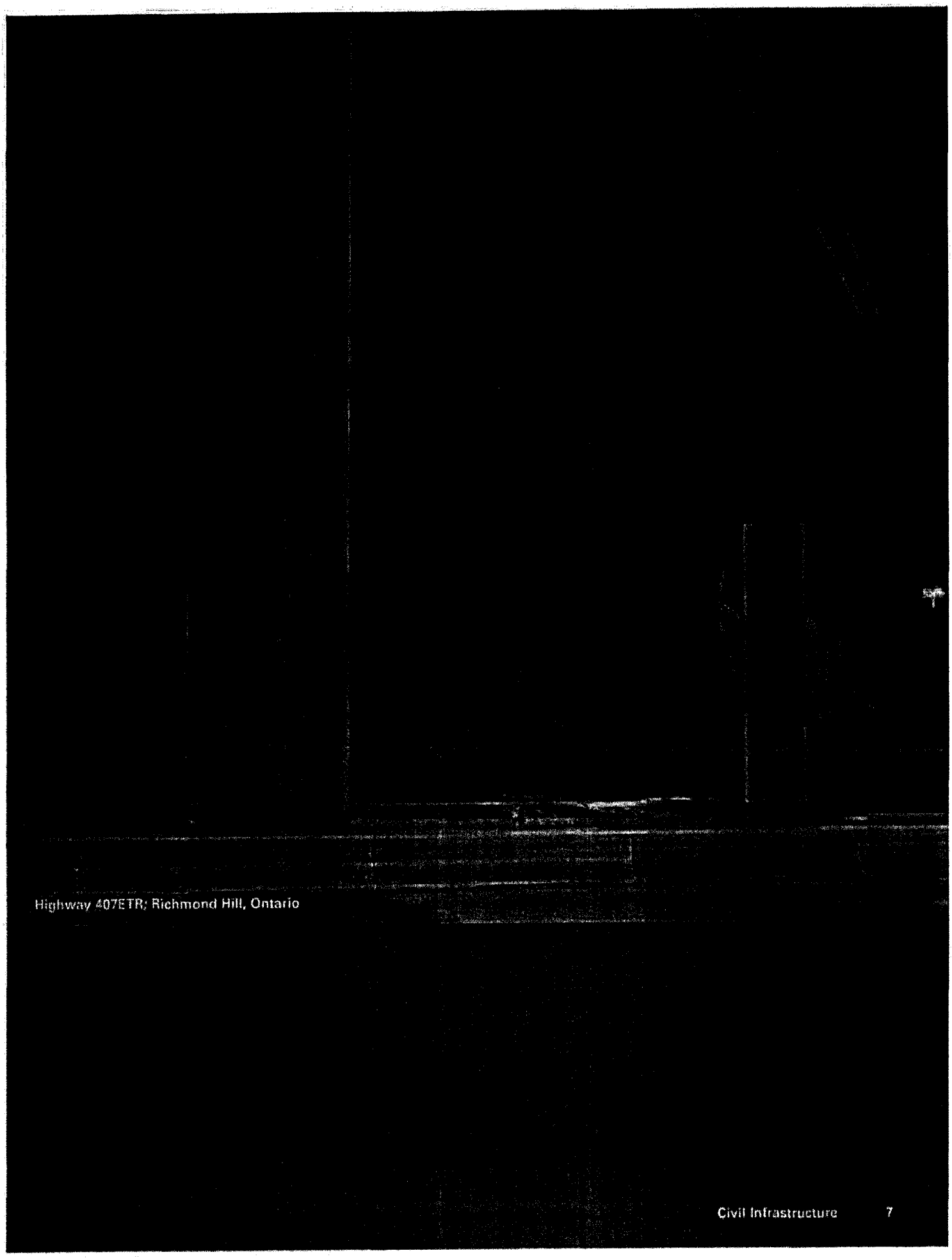
BUILDING THINGS THAT MATTER



AECON
Infrastructure







Highway 407ETR; Richmond Hill, Ontario

REVELSTOKE DAM; REVELSTOKE, BRITISH COLUMBIA

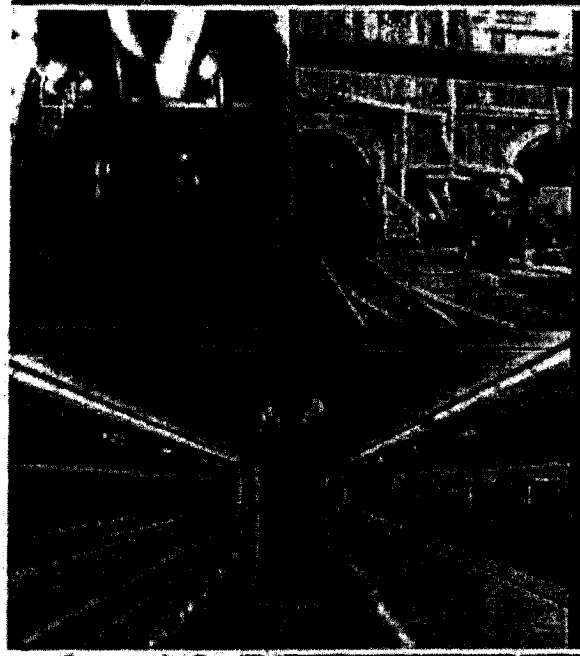
Client
BC Hydro

Cost
$320 million

Division
Aecon Constructors

Construction and completion of the main dam and powerhouse at Revelstoke, and a diversion tunnel (550m long and13m in diameter). The main dam is 175m high, 470m long, and 126m thick at its base.

The Revelstoke dam and powerhouse on the Columbia River is British Columbia's largest hydroelectric facility with a potential generating capacity of 2,760 MW. At the peak of construction, operations continued around the clock and over 1,500 craftsmen and supervisory personnel were on site. In total, more than 6,000 man years of work were required to complete the dam and powerhouse. The project was also a challenge in terms of technology and engineering expertise. More than 2.3 million m³ of concrete were required for the dam.



SHEPPARD SUBWAY; TORONTO, ONTARIO

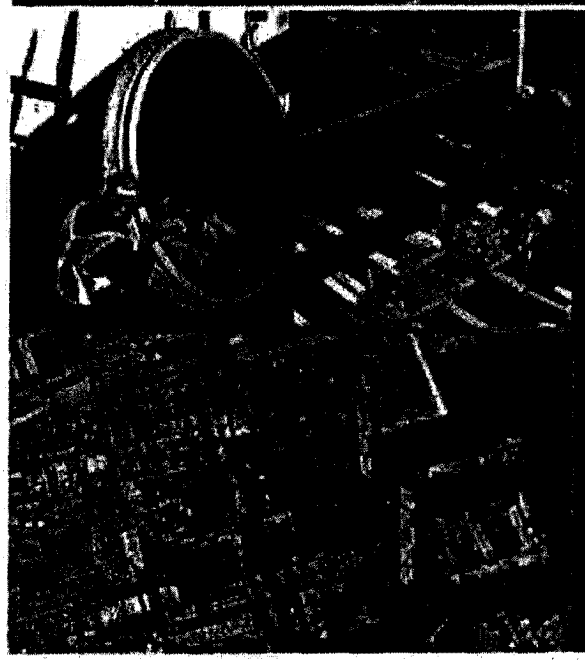
Client
Toronto Transit Commission

Cost
$93 million

Division
Aecon Constructors

Construction of twin tunnels

The tunnels were split into 4 sections and included two 3.3km drives from a launch shaft and two 660m drives from a separate launch shaft. Between the two launch shafts lies a station, a bridge and a 450m section of cut and cover tunnel, the latter of which was built under this contract along with 7 shafts, 4 station headwalls, a 150m triple cell precast culvert crossing and 3 emergency exit buildings. Two Lovat 5.9m diameter earth pressure balanced (EPB) tunneling machines advanced simultaneously.



THE PORTLANDS ENERGY CENTRE; TORONTO, ONTARIO

Client
SNC Lavalin

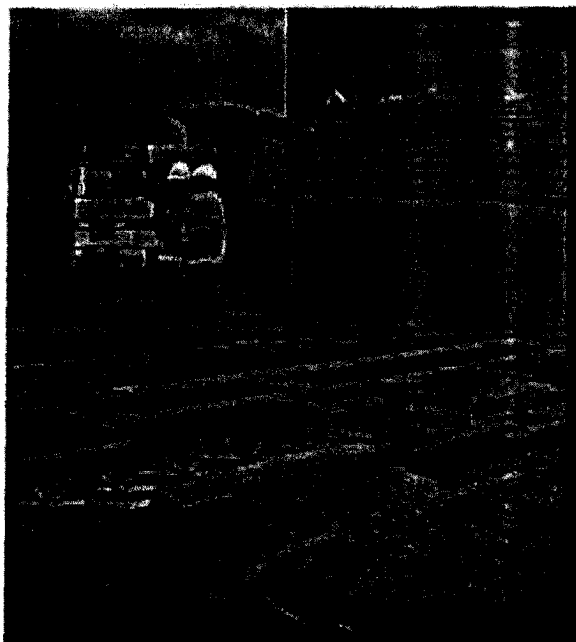
Cost
$730 million

Aecon Contract
$70 million

Divisions
Aecon Constructors, Aecon Construction and Materials Ltd.

Construction of a new power generation plant on Toronto's waterfront, set to generate 550 megawatts of electricity to power 500,000 homes by 2009. The plant will operate as a peaking station, producing power to meet demand as needed. The complete construction project covers 160,000 square feet.

Aecon is completing the work to install the inlet and outlet piping, the installation of a 96-inch circulating pipe, building the pump house for the plant, completing the foundation work for the main plant, and completing site works.



QUITO AIRPORT; QUITO, ECUADOR

Client
Corporacion Ouiport

Cost
$414 million

Division
Aecon Constructors

Construction of a new international airport in the Andes Mountains, including 4,100 metres of runway, terminal (38,000 sq m), hangar (5,000 sq m), control tower, support buildings.

A project that has been in the works for more than 10 years will replace the existing airport. Aecon, an equity partner in the project, is expected to finish the project in 2010. The majority of workers on the project are local with a team of 15 Canadians who manage the political, cultural and language challenges of a foreign country project. The Ecuadorian team is very excited as this is the country's first high-profile international construction project.

GREATER TORONTO AIRPORT AUTHORITY FOUR LANE VEHICLE TUNNEL; TORONTO, ONTARIO

Client
Greater Toronto Airport Authority

Cost
$40 million

Division
Aecon Construction & Materials Ltd.

Construction of a twin cell box structure, 550m long x 26m wide x 7.4m high. The twin cell acts as a runway underpass for vehicle access.

This project required a large excavation of more than 400,000m³ of earth, de-watering, and 65,000m³ of concrete was cast for the construction of the underpass. Under prior contracts, Aecon has constructed many of the original taxiways and runways at the airport. All the work was completed on nights and weekends. There were also contracts being constructed adjacent to Aecon's requiring additional coordination. The project was completely successful with Aecon meeting all the early schedule bonus deadlines.

WESTERN BEACHES BREAKWALL; TORONTO, ONTARIO

Client
Toronto and Region Conservation Authority

Cost
$19 million

Division
Aecon Construction & Materials Ltd.

Building a 600-metre long wall (8 metres high, 25 metres wide at base and 7 metres wide at top) takes more than 240,000 tonnes of stone, almost twice the weight of the CN Tower. To deal with the unique challenge of getting the stone into downtown Toronto, 20 trucks ran six days a week, 24 hours/day with most of the stone coming from Aecon's Marmora quarry. Nine barges ferried 500 tonnes of stone at a time, 150 metres off shore to the new breakwater.

HIGHWAY 407ETR; ELECTRONIC TOLL ROAD, TORONTO, ONTARIO

Client
Government of Ontario

Cost
$1 billion

Divisions
Aecon Construction & Materials, ACML Materials, AME

Development, design, build & operation of a 69km electronic toll highway in the Greater Toronto area. This multi-lane urban highway is the largest single civil engineering contract tendered in Canadian history and the first major infrastructure project in Canada to be developed by a public-private partnership.

The project incorporated 120 bridges including 20 interchanges, 15 grade separations, 13 river/creek crossings and 8 railway crossings. In addition, construction involved approximately 85km of sewer pipe, 11 million tonnes of aggregates, 580,000 tonnes of open graded drainage layer, 600,000 tonnes of asphalt and 1 million cubic metres of concrete road base. The high-tech toll road operates without collection booths making it one of the first non-stop, completely electronic toll highways in the world.

QUEEN ELIZABETH WAY, 16 MILE CREEK; OAKVILLE, ONTARIO

Client
Ministry of Transportation Ontario and Region of Halton

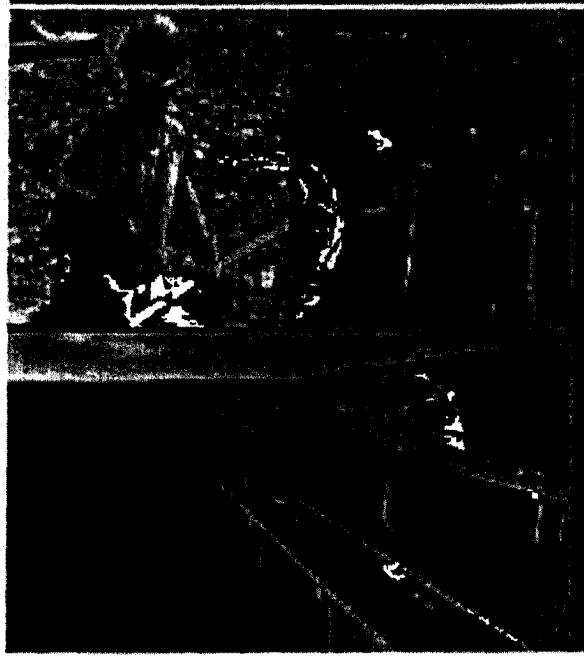
Cost
$16 million

Divisions
Aecon Construction & Materials, ACML Materials, AME, AGI Traffic Technology, OX Locates, Miwel Construction

Construction of a 195 metre concrete bridge (20 metres high) and a 500 metre watermain.

This new bridge, which adds four new lanes on a busy highway, has five precast concrete spans set on four sets of piers and two abutments on either side of the ravine. Massive precast girders, each one up to 45 metres long and weighing as much as 55 tonnes were lifted into place, each taking less than an hour for two cranes with 65 metre long booms to position on the piers.

A 98 metre tunnel was required for the installation of the watermain. Drilling through shale and pumping out 600,000 litres of water a day to keep the tunnel dry took four months to complete.



CROSS ISRAEL HIGHWAY; ISRAEL

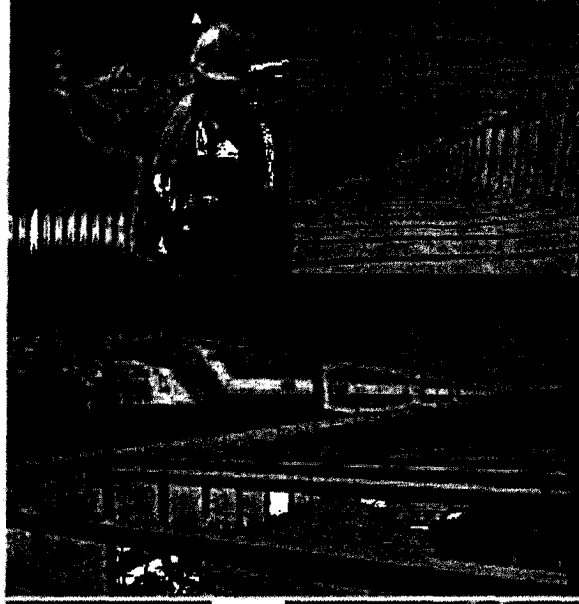
Client
Derech Eretz Highways

Cost
$1.53 billion

Divisions
Aecon Constructors, AGI Traffic, Aecon Concessions

Successful experience in the construction of Canada's first Express Toll Road, led to Aecon's invitation to participate in the bid for Israel's first express toll road. In 1999, a special purpose concession company, Derech Eretz Highways Ltd., in which Aecon holds a 25% stake, entered into a Concession Contract with the State of Israel for the financing, designing, construction, operation, and maintenance of the Cross Israel Highway under a 30 year concession.

Project scope included the design and construction of 87km of new highway, an associated 100km of agricultural service road construction, the construction of 13 interchanges, 80 bridges, as well as a twin-barrel tunnel, which is 400 metres long through rock.



HAGERMAN RAIL TO GRADE SEPARATION; GREATER TORONTO AREA, ONTARIO

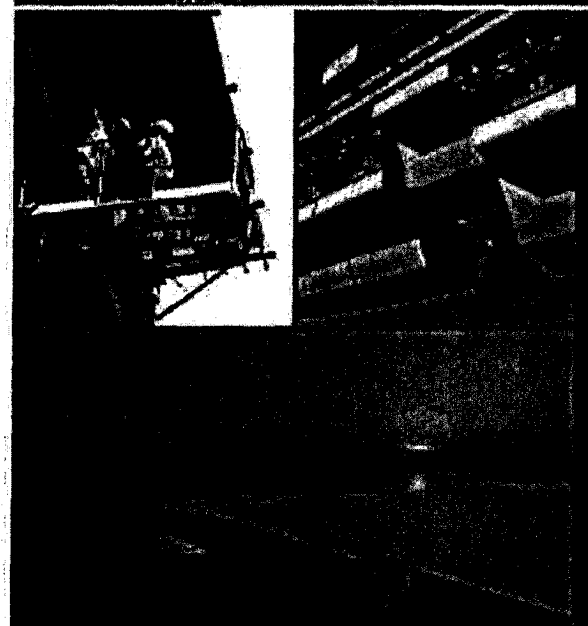
Client
GO Transit

Cost
$55 million

Divisions
Aecon Construction & Materials Ltd, Miwel Construction, ACML Materials, Aecon Materials Engineering, Aecon Utility Engineering, Aecon Utilities, QX Technology, QX Locates

Project: Build a 1,600 metre long grade separation for GO Train line, relocate utilities, build one rail bridge, build one road bridge

A grade separation for a rail line must be a lot longer and deeper than for automobiles for a 2% slope requirement. In order to meet the maximum slope requirements, the open cut tunnel, known as a depressed corridor, had to be 1,600 metres long and because of the depth of the cut and the lack of space, the cut had to have vertical walls. This required the excavation of almost 250,000 cubic metres of earth. In all 4,000 cubic metres of concrete, 1,000 tonnes of structural steel and 500,000 broad-feet of timber were required to complete the project.



VANCOUVER SKY TRAIN; VANCOUVER, BRITISH COLUMBIA

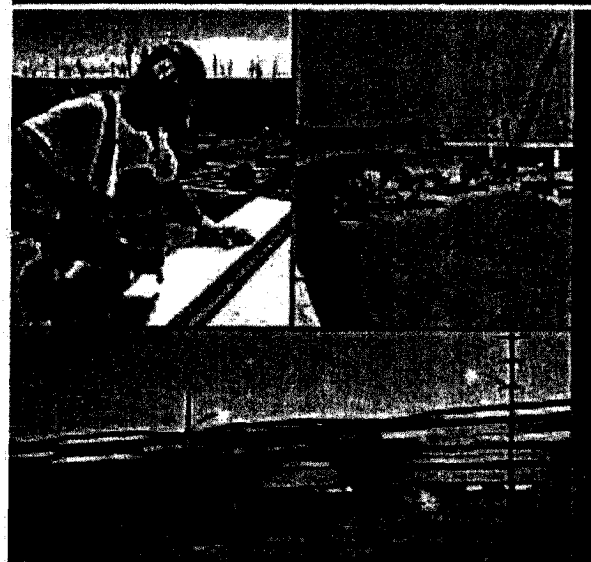
Client
Rapid Transit Project 2000

Cost
$270 million

Divisions
Aecon Constructors

The design and construction of a 17km extension to the existing elevated Skytrain system, the Millennium Line.

Aecon, as a lead member of the SAR Transit Joint Venture, was selected as the preferred proponent for the project after winning the very demanding technical and commercial evaluation process conducted by the Owner's representatives. During the construction period, the guideway was erected at an average rate of one kilometre per month.



ENTERPRISE DRIVE/HELEN AVENUE EXTENSION AND GO TRANSIT RAIL UNDERPASS; MARKHAM, ONTARIO

Client
Town of Markham

Cost
$17 million

Divisions
Miwel Construction, Aecon Utilities, Aecon Construction & Materials Ltd.

Construction of a four-lane road with many unique city challenges: a 54 metre long triple span bridge was required as an underpass to take the new road under the main North-South rail line, relocation of storm water and sanitary sewer lines. Also required was a special kilometre long of distribution piping system to carry hot and cold water from energy plant to the downtown core.

Project requirements:
Road works – 75,000 tonnes of granular
Asphalt – 10,000 tonnes
Concrete curb and gutter – 4,000 metres
Bridge span – 54 metres
Bridge concrete – 4,500 cubic metres
Distribution piping – 1.1 kilometres

"I go to work every day knowing that the equipment I'm using is well maintained, every possible safety precaution has been taken, and my co-workers have my back. It lets me concentrate on my work without any distractions and makes for a better outcome all around."

PAT MURPHY, BULLDOZER OPERATOR, AECON CONSTRUCTION & MATERIALS LTD., EMPLOYEE SINCE 1963

PIPELINES

HYDRO TRANSMISSION & DISTRIBUTION

TELECOMMUNICATIONS

WATER & SEWER

DISTRICT ENERGY

UTILITY INFRASTRUCTURE

Aecon Infrastructure has long taken a leadership role in the design, installation and maintenance of municipal and private utilities, including sewer and water services, electrical and telecommunication networks, gas distribution, district energy cooling and heating systems, and more.

Safe execution and unparalleled network integrity have earned Aecon the highest possible level of client trust in locating underground facilities for our projects as well as those of other service providers.

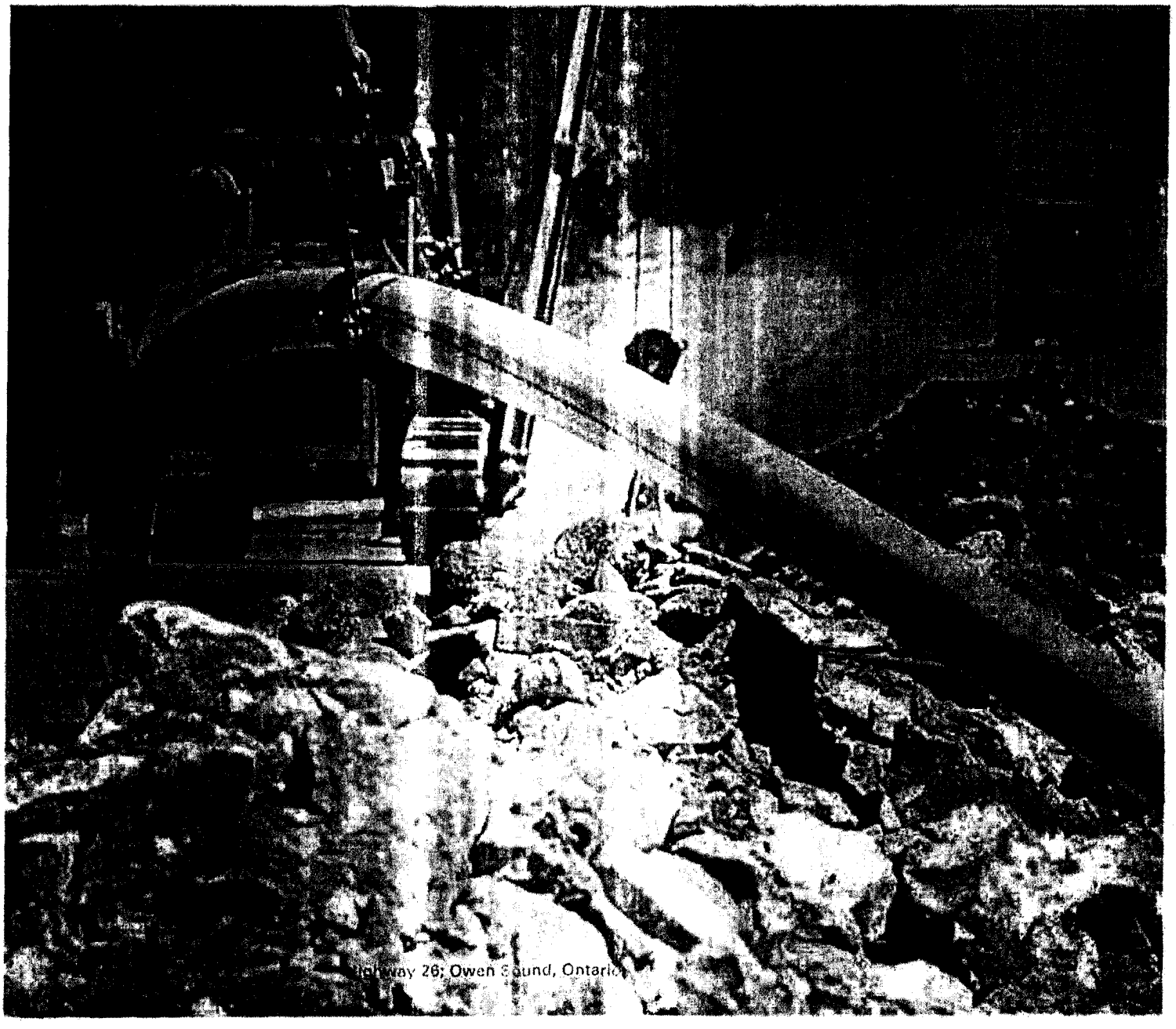
Highway 26; Owen Sound, Ontario

Cable Locator; Oakville, Ontario

Safe, efficient oil and gas delivery is critical to the country's clean energy strategy. Aecon Infrastructure's involvement in the construction of main line and distribution pipelines has resulted in improved delivery and customer service performance — as well as reduced delivery costs — for some of the provinces' largest energy suppliers.

In western Canada's oil sands, Aecon has been actively involved in the construction of foundations, pilings and pile caps for tank farms. Our proven expertise has earned it an increasing amount of business in the burgeoning western economy.

PIPELINES

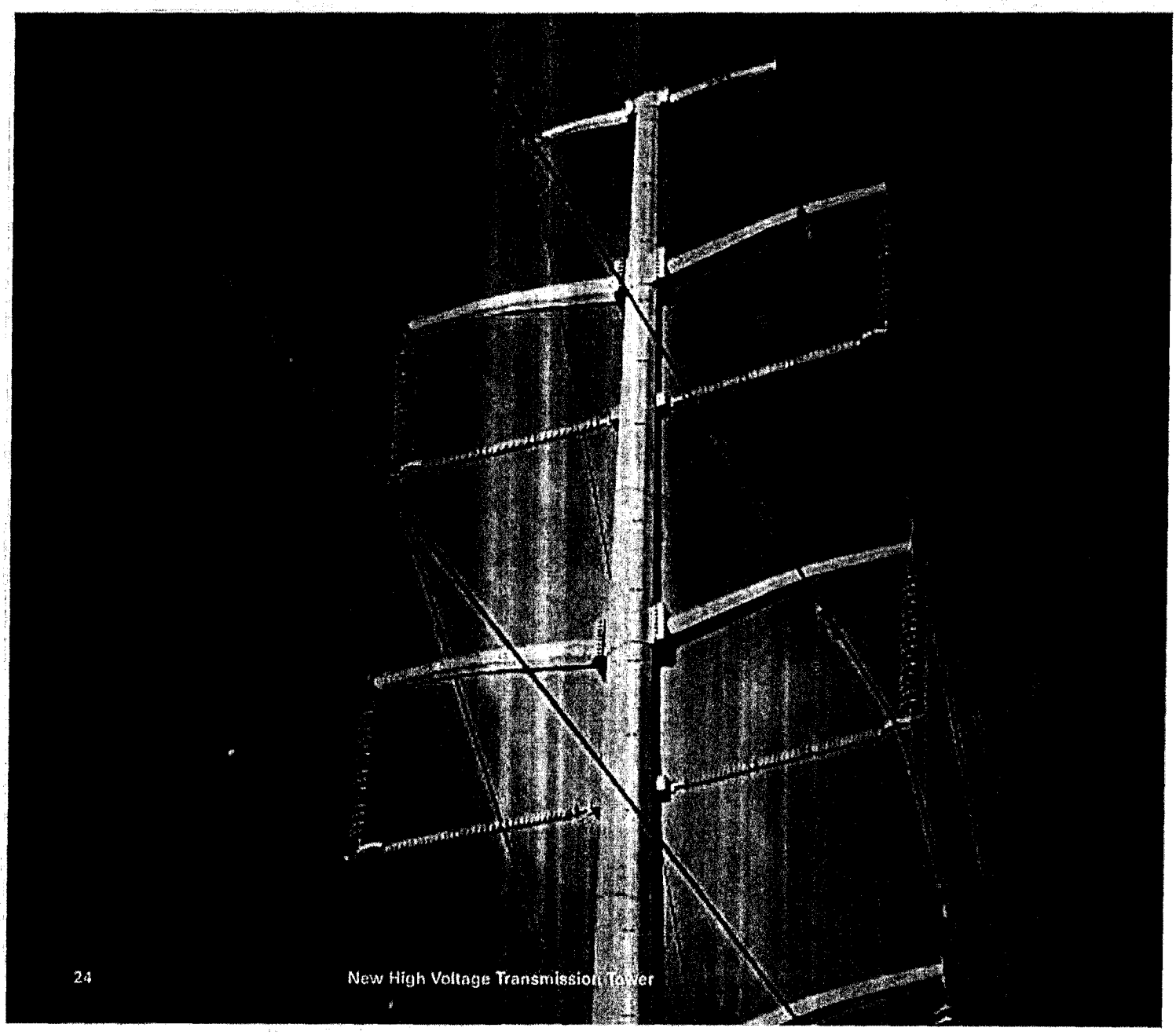


Highway 26; Owen Sound, Ontario

When it comes to electricity, there is simply no room for error. That's why Canada's largest local distribution companies, municipalities and public venues such as Pearson International Airport trust Aecon Infrastructure to keep them up and running.

Aecon's unwavering commitment to safety and expertise in installing and rehabbing electrical networks has also made it a preferred partner among developers, who choose us to coordinate joint use installations along with telecommunications, cable TV, and gas.

HYDRO TRANSMISSION & DISTRIBUTION

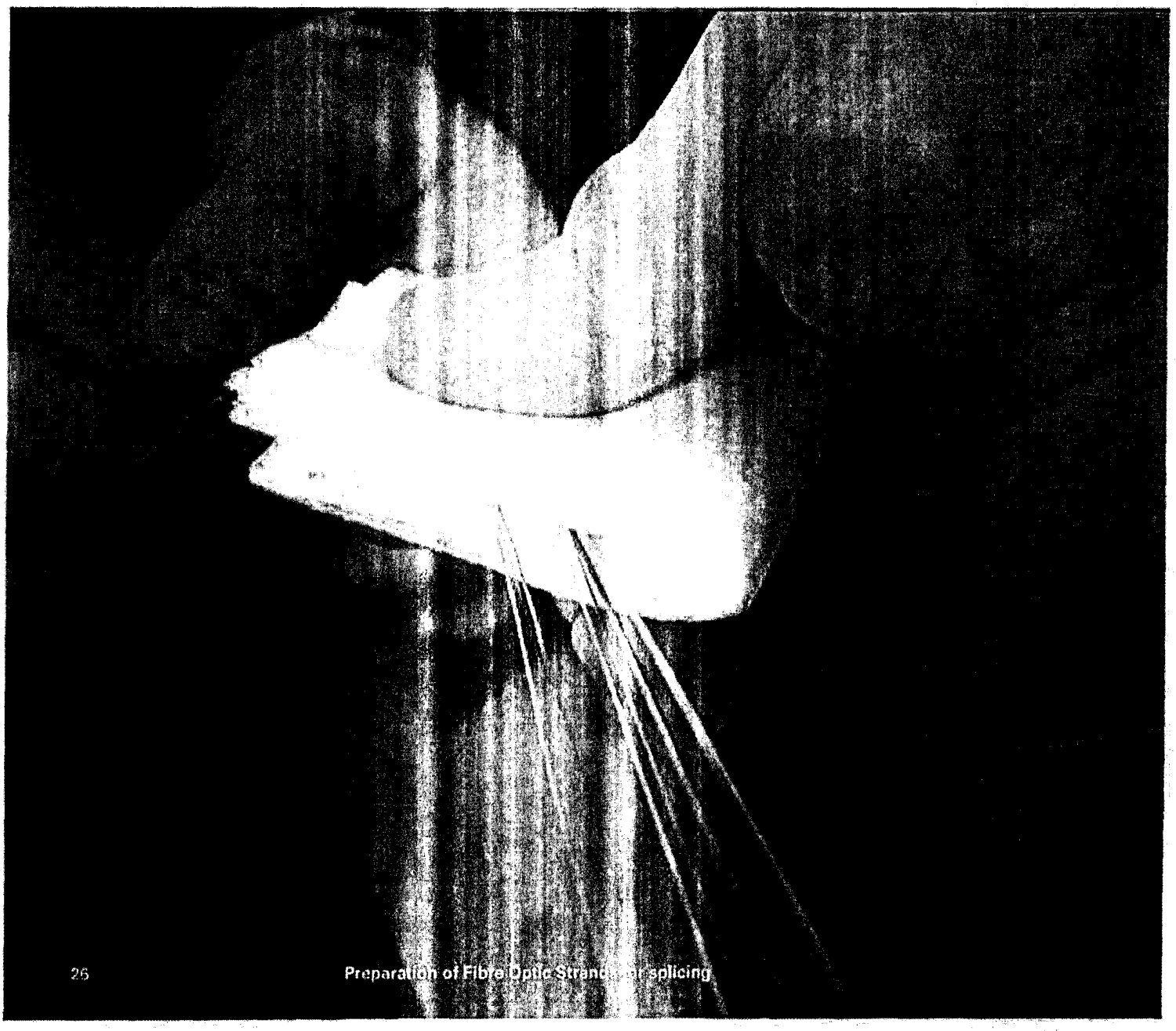


New High Voltage Transmission Tower

For more than 50 years, Aecon Infrastructure has partnered with industry leaders on the building and maintenance of legacy copper, next generation fibre/digital, and coaxial telecommunications networks.

In settings from rural to urban, Aecon brings communications to residential, commercial, institutional and industrial customers, meeting their needs for quality installation, cost containment, and exceptional service.

TELECOMMUNICATIONS

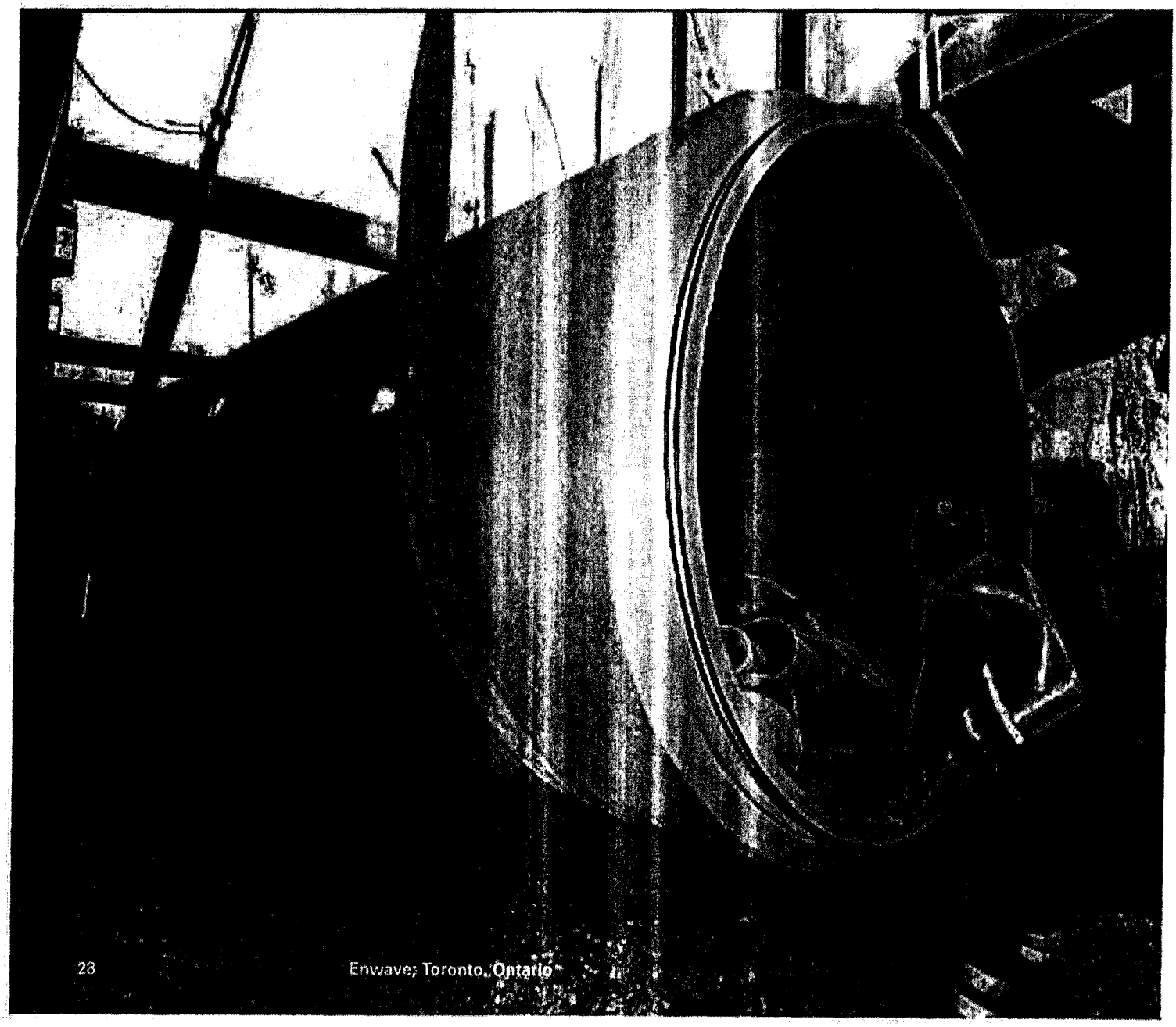


Preparation of Fibre Optic Strand for splicing

Reconstructing roadways over and installing large pipelines under environmentally sensitive wetlands. Also the installation of large-diameter pipe below Canada's most congested urban landscape.

Aecon Infrastructure thrives on the challenge of the most demanding, high-profile installations imaginable. From augering through solid rock to negotiating around delicate ecosystems, Aecon operates with confidence in any environment.

WATER AND SEWER, DISTRICT ENERGY



Enwave; Toronto, Ontario

AGGREGATES

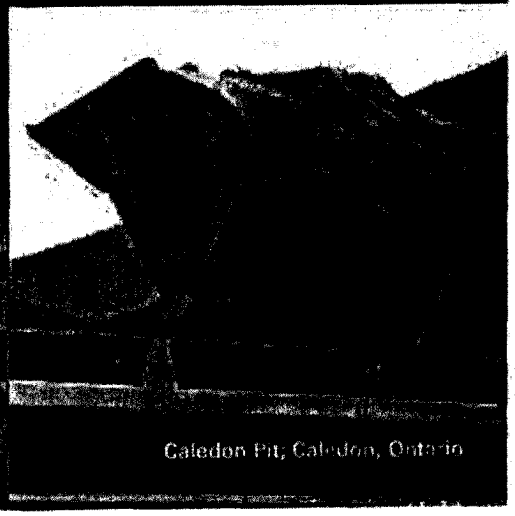
ASPHALT

MATERIALS

Super highways and super structures require superior raw materials, starting with a solid foundation of road bed aggregates and continuing with just the right asphalt hot mix. Aecon Infrastructure has been supplying its projects — as well as those of other firms — with top-grade materials for over 50 years.

Aecon's in-house materials engineering division is constantly studying and testing concrete and asphalt hot mixtures, and developing new materials to meet clients' most stringent quality needs.

Brampton Asphalt Plant, Brampton, Ontario

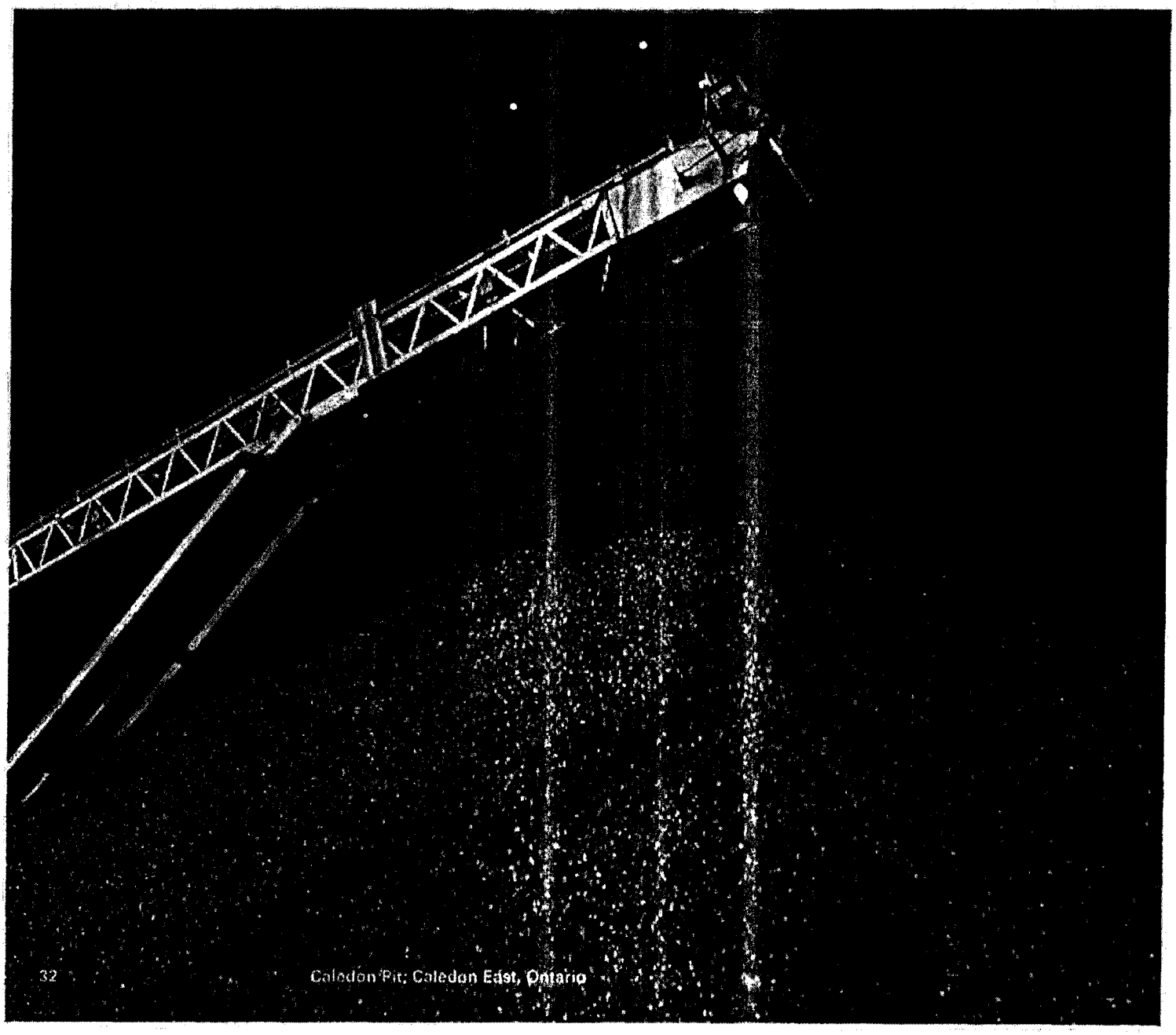


Caledon Pit, Caledon, Ontario

From large armour stone that holds back Mother Nature to world-class sand for the United States Golf Association (USGA), Aecon Infrastructure's in-demand products meet a wide range of industry needs. With many pits and quarries all across Ontario, as well as world-class testing laboratories, Aecon's name is synonymous with quality aggregates, soils and sand.

Specialized services include portable crushing plants and production facilities for on-site convenience. Certified by the USGA, we also supply the golf course industry with top dressing mixes, hydro seeding and mulching services.

AGGREGATES

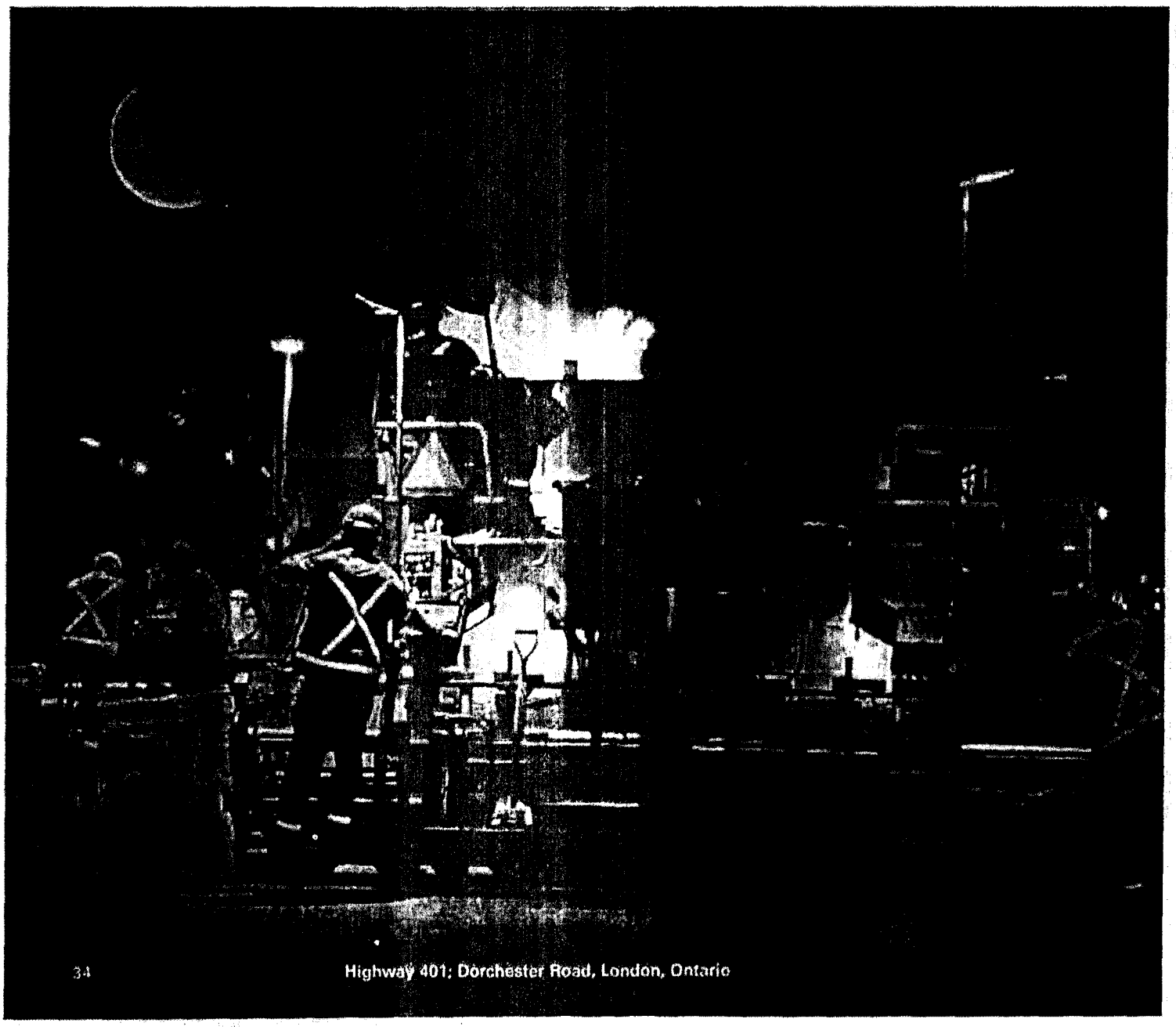


Caledon Pit; Caledon East, Ontario

Award-winning asphalt can begin with the deployment of one of our portable asphalt plants directly to the job site or from one of our stationary plants — an Aecon hallmark for over 40 years that has resulted in numerous "Paver of the Year" designations.

By not transporting asphalt over long distances, Aecon delivers hot, fresh product that performs better and lasts longer. It also cuts down on pollutants, a best practice acknowledged with a Trillium Award for "being the standard by which all others are judged; good plant operators who are also good corporate citizens."

ASPHALT



Highway 401; Dorchester Road, London, Ontario

An ambitious vision —"to be the first company people go to for building things that matter"—sets the tone for every interaction between *Aecon Infrastructure* and its customers. Our team members strive for personal and team satisfaction in a job well done and the building of long-term business relationships.

Though public recognition has never been our goal, we are humbled and honoured by the many acknowledgements that have come our way.

Below is a sampling of the countless awards our team has earned over the years, spanning every facet of our business. They are testament to our culture of excellence, where people thrive on earning our customers' trust, executing their projects with intelligence and innovation, and exceeding their expectations every step of the way.

AWARDS & ACKNOWLEDGEMENTS

2007 [illegible] **THE YEAR,** **INTE**[illegible] **ST**[illegible] **/MCKENZIE WET**[illegible] **AMER**[illegible] **ASS**[illegible]

2006 [illegible] **F THE YEAR,** ONTA[illegible] WORKS ASSO[illegible] FOR ST. JOHN S[illegible] ROAD [illegible]ZIE WETLAND P[illegible]JECT

2006 [illegible] PAVER OF THE [illegible] FINA[illegible] PRODU[illegible]RS [illegible]

2006 TRILL[illegible] ONTARIO [illegible] ASSOCIATION, FOR [illegible] THE STANDARD BY WHICH ALL OTHERS ARE JUDGED: GOOD PLANT OPERATORS WHO ARE GOOD CORPORATE CITIZENS". FIRST PORTABLE ASPHALT PLANT TO EVER WIN THE PROVINCIAL AWARD

2005 PROPERTY ENHANCEMENT AWARD ONTARIO STONE AND GRAVEL ASSOCIATION FOR THE PINCHIN QUARRY

2002 HOT MIX PAVING CONTRACTOR OF THE YEAR MINISTRY OF TRANSPORTATION OF ONTARIO

2001 HOT MIX PAVING CONTRACTOR OF THE YEAR [illegible]OF TRANSPORTATION [illegible]

BRINGING IT ALL TOGETHER...

The projects Aecon Infrastructure and its clients undertake are often large, costly and complex — molding and changing the infrastructure landscape across Canada, and improving people's abilities to live, work, and travel. By nature of the construction business, these projects demand the very best in care and execution.

Aecon is proud of the trust that our clients have placed in us for nearly 100 years, and their recognition of the value we bring to each and every project we undertake — value drawn from our partnerships, our resources, and most of all, our people.

Partnerships
Each year, the list of our partnerships grows. By developing strong strategic alliances with some of Canada's leading infrastructure providers, we deliver sustainable cost savings, improved service levels and higher levels of quality, year after year.

Resources
Our strength lies in bringing the right resources to each project. With annual equipment investments in excess of $30 million, we offer one of the most diverse and specialized equipment fleets in the country. A proven track record of performance and safety allows us to secure bonding and insurance for projects of any size.

People
It is in our people that customers place their trust. Our reputation for candour, commitment to innovation, and attention to detail attracts the best in the business. Challenging work, satisfaction in a job well done, and the knowledge that we are committed to sending every team member home safely to their families each night, brings an energized team to every Aecon Infrastructure project.

BUILDING THINGS THAT MATTER

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Toronto, Ontario Canada
M9W 7K6

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Toll Free: +1 877 232 2677
Fax: +1 416 940 2285
Email: aecon@aecon.com

FSC
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Printed with up to 30% recycled fiber and with chlorine free pulp using timber from managed forests

www.aecon.com

AECON
Infrastructure

BUILDING THINGS THAT MATTER

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E-mail: aecon@aecon.com

BUILDING THINGS THAT MATTER

Mixed Sources
FSC

www.aecon.com

AECON

AECON


HELPING CUSTOMERS THRIVE
Client achievements are the heart of the Aecon success story.
From small to large and start to finish, we're committed to helping our customers achieve their objectives in all aspects of construction.
From design and engineering to construction and project finance, we work tirelessly to make expectations reality.
This determination to deliver on our promises has fueled Aecon's growth; today, there isn't a more diverse or respected construction and infrastructure development company in Canada.
H
www.aecon.com

BUILDING THINGS THAT MATTER

SINCE 1910

Modernizing St. John's Harbour, Newfoundland, 1937.

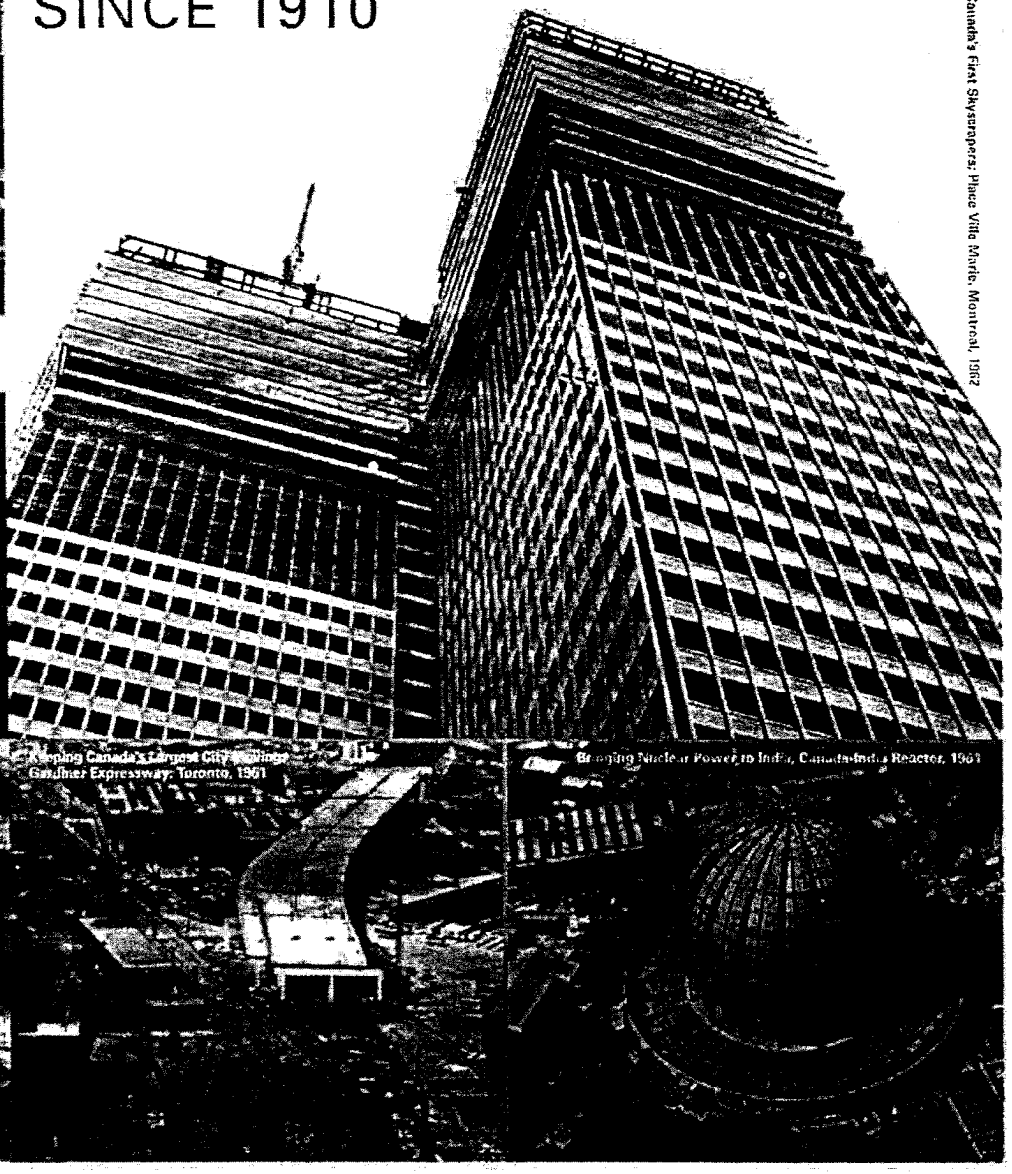
Preparing for [illegible]

Vancouver Ferry Terminal, 1942

Pantages Theatre, Toronto, 1923

South Wing, Women's College Hospital, Toronto, 1954

Connecting the Great Lakes to Ocean Shipping: Iroquois Lock, St. Lawrence Seaway, 1958



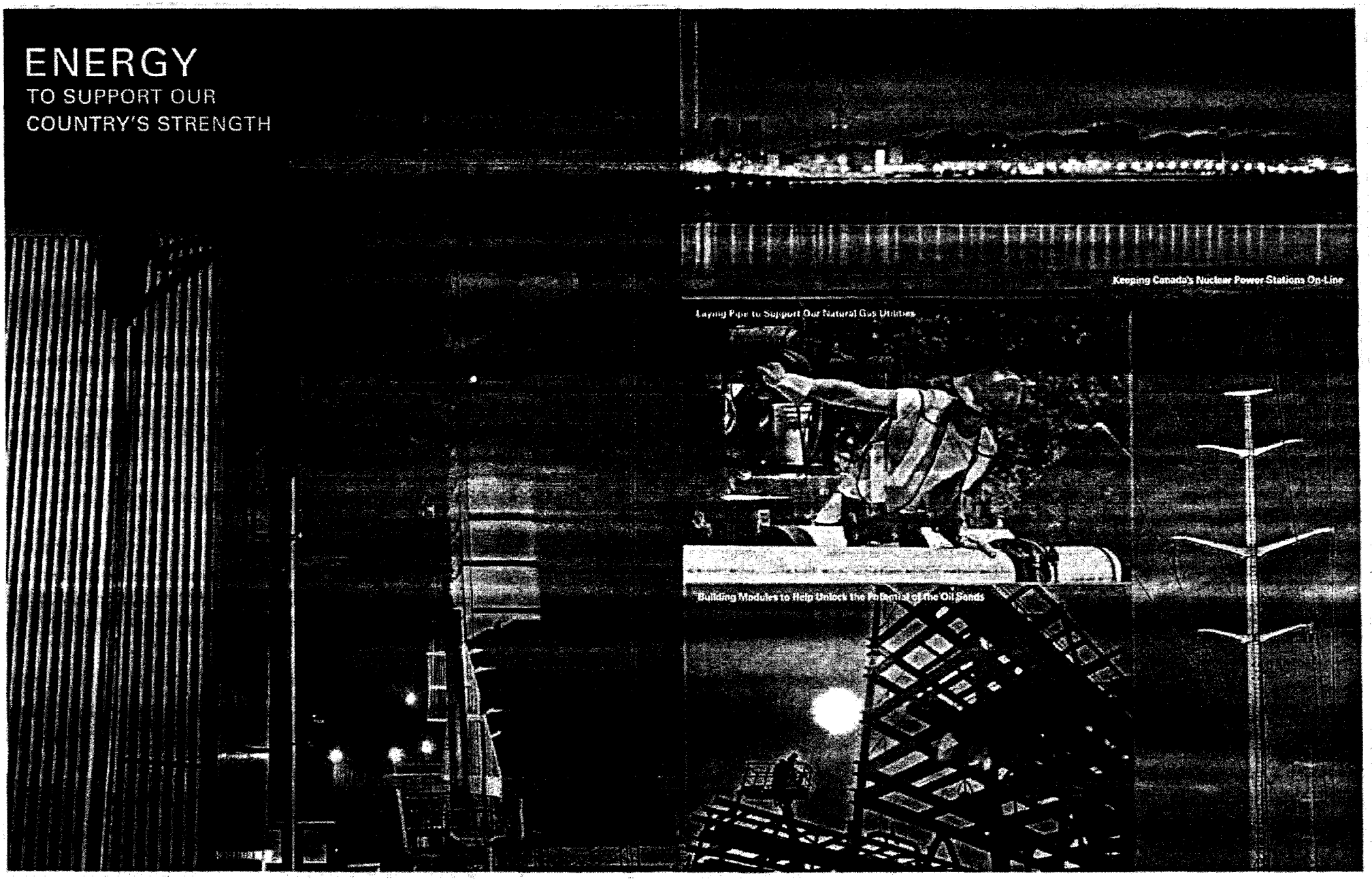
Keeping Canada's Largest City Moving: Gardiner Expressway, Toronto, 1961

Bringing Nuclear Power to India, Canada-India Reactor, 1961

One of Canada's First Skyscrapers: Place Ville Marie, Montreal, 1962

ENERGY

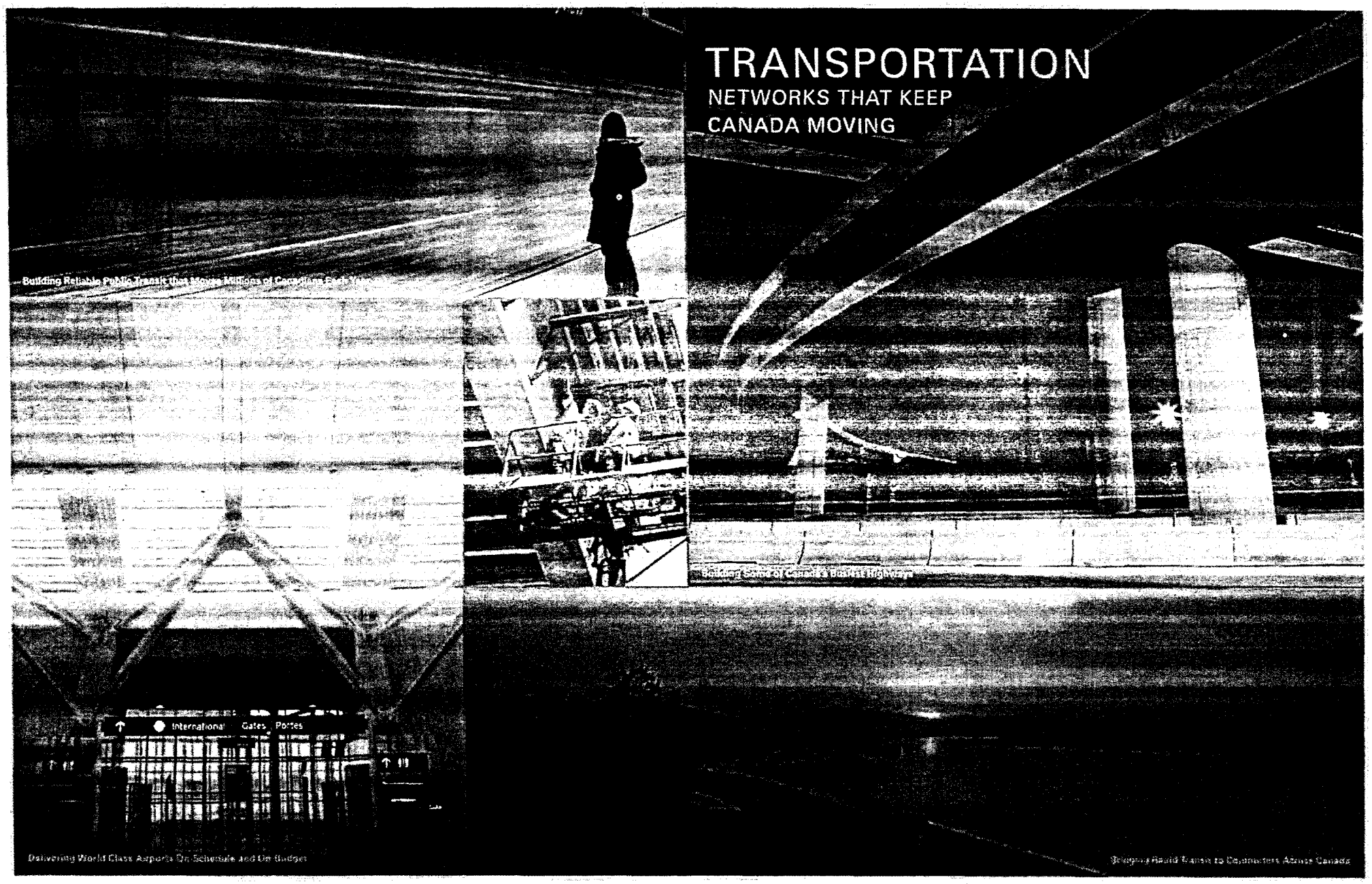
TO SUPPORT OUR COUNTRY'S STRENGTH



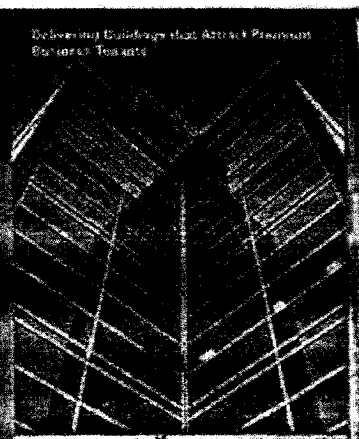
Keeping Canada's Nuclear Power Stations On-Line

Laying Pipe to Support Our Natural Gas Utilities

Building Modules to Help Unlock the Potential of the Oil Sands


TRANSPORTATION
NETWORKS THAT KEEP
CANADA MOVING
International Gates Portes

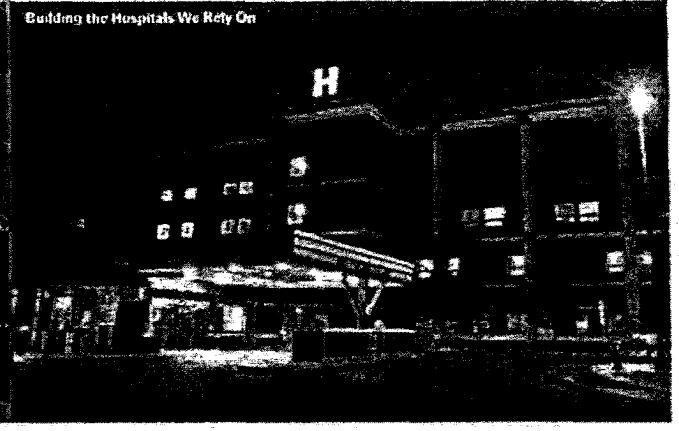
BUILDING
OUR PUBLIC PLACES



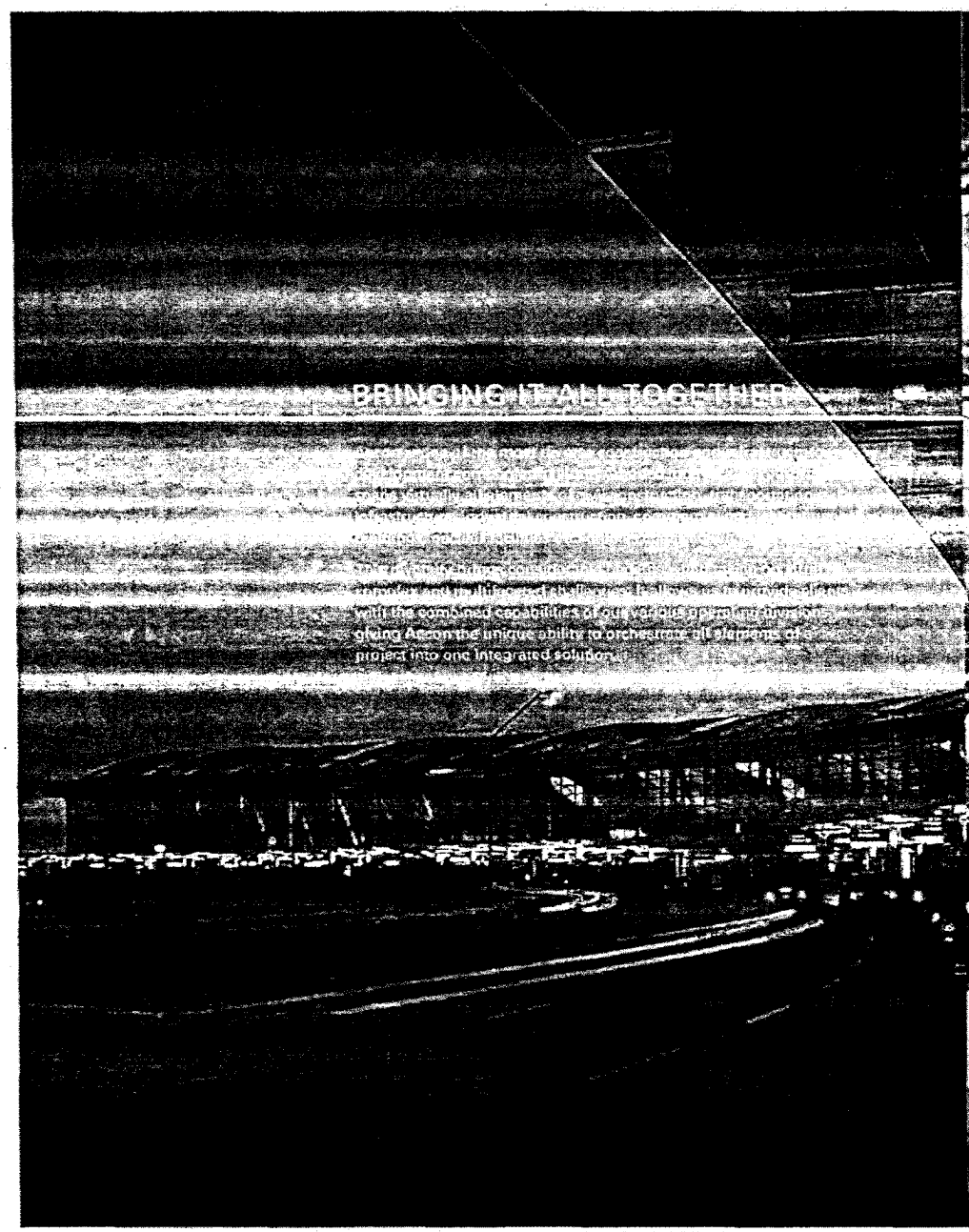
Delivering Buildings that Attract Premium Business Tenants

Creating Public Spaces that Connect People

Providing Educational Facilities that Combine Efficiency and Flexibility

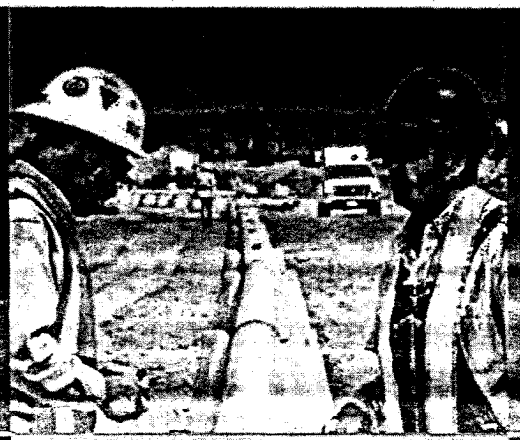


Building the Hospitals We Rely On



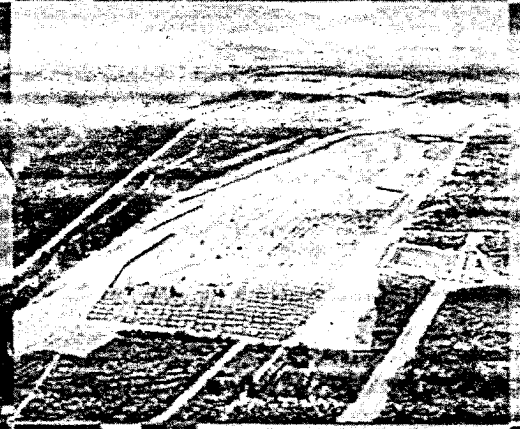
BRINGING IT ALL TOGETHER

with the combined capabilities of our worldwide operations, giving Aecon the unique ability to orchestrate all disciplines of a project into one integrated solution.



"Whether it's Aecon Industrial, Aecon Buildings or Aecon Infrastructure, being able to tap into Aecon's broad range of expertise is making Union Gas more efficient at what we do."

George Pappas, Union Gas



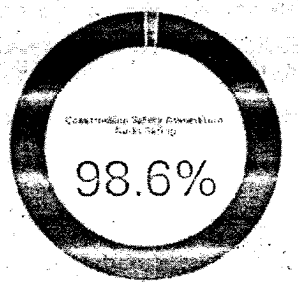
Quito International Airport
Quito, Ecuador

"From pipe fabrication to module assembly to on site installation, Aecon's ability to deliver every facet of a project is key to our success."

John Brick, Aecon Group Inc.

PEOPLE MATTER

EVERY HOUR OF EVERY DAY



AN INDUSTRY LEADING SAFETY PROGRAM

At Aecon, we believe that positive results can only be achieved by providing safe, healthy working conditions and impeccably maintained equipment.

Our zero injury culture has a positive impact on everyone we work with and for – our employees, our subcontractors and our clients.

Safety. Every day, everywhere.

50 BEST EMPLOYERS IN CANADA 2008

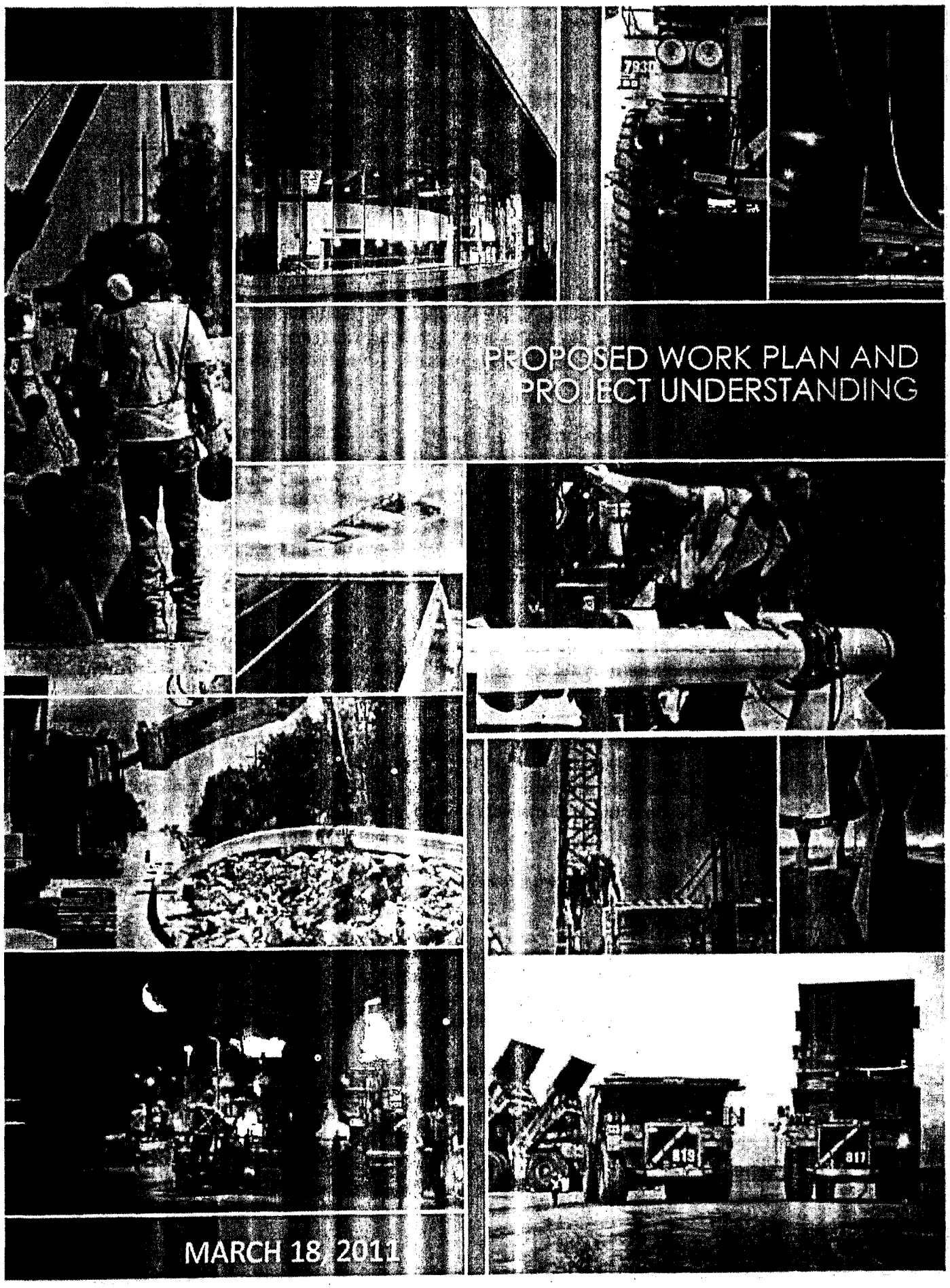
ONE OF CANADA'S BEST PLACES TO WORK

Talented, passionate people are naturally drawn to Aecon because they want to be a part of the great projects we deliver.

Employees quickly learn they've joined a company that rewards achievement with opportunity in a culture that cares about them and their families.

Aecon is recognized as one of Canada's best employers by *Report on Business* magazine.

At Aecon, people matter.



PROPOSED WORK PLAN AND PROJECT UNDERSTANDING

MARCH 18, 2011

Proposed Work Plan and Project Understanding

Thank you for providing us the opportunity to submit to Natural Resource Gas Limited. ("NRG") our service proposal for the development of a Maintenance Protocol for the Ethanol Pipeline located in the Municipality of Malahide and Town of Aylmer, Ontario.

Project Understanding

NRG owns and operates, as part of its natural gas distribution system in southwestern Ontario, a dedicated NPS-6 carbon steel pipeline which provides sweet natural gas to an ethanol plant located in Aylmer, Ontario (the "Ethanol Pipeline"). This pipeline feeds a single end-user (IGPC Ethanol Inc. or IGPC) and is not interconnected with the rest of NRG's natural gas distribution system.

The Ethanol Pipeline came into service in the summer of 2008. It is approximately 28.5 kilometres in length and was interconnected with the Union Gas Limited natural gas distribution at a location north of Highway 401 on Bradley Avenue. It runs east along Bradley Avenue and then south along Highway 74 (Westchester Bourne Road) and meanders along other smaller roads ending at the IGPC plant site in the Town of Aylmer. The Ethanol Pipeline enters briefly into Union Gas franchise area to remain in the road allowance and avoid crossing private property. The pipeline routing also enters the Township of Malahide, the Municipality of Thames Centre, and the Town of Aylmer.

The Ethanol Pipeline has a maximum operating pressure of 3450 kilopascal (kPa), with a guaranteed delivery pressure of 2070 kPa from Union Gas Limited. IGPC requires a delivery pressure of 420 kPa from NRG.

The operation of the Ethanol Pipeline is regulated by numerous bodies including the Ontario Energy Board (EOB), Ontario Regulation 210/01, the Occupational Health and Safety Act (OHSA) R.S.O. 2002, and the Technical Standards and Safety Authority (TSSA). As such, it is expected that the pipeline be operated and maintained to meet all applicable legal and regulatory standards, and code requirements.

NRG is seeking to establish a Maintenance Protocol to ensure the safe and responsible maintenance of the Ethanol Pipeline.

This Maintenance Protocol will have regard to the safety of IGPC, NRG and the public at large, and should ensure compliance with all legal and regulatory standards in Ontario, and be commensurate with good utility practice, and be consistent with the industry-accepted practices for maintenance of similar pipeline facilities within the Province of Ontario.

Materials contained in this proposal for the development and completion of the steel pipeline maintenance protocol will be used in the RFP issued to prospective third-party maintenance contractors. The enclosed proposal is submitted to NRG on the condition and understanding that such proposal shall not preclude AUE or its affiliates from submitting proposals to the second RFP

Elements of the Pipeline Maintenance Protocol

AUE proposes to develop the Pipeline Maintenance Protocol for the Ethanol Pipeline with the following elements:

- Jobsite hazard assessment procedure
- Hazardous materials training / Transportation of Dangerous Goods
- Leakage and spillage reporting procedure
- Confined space entry
- Traffic control plan
- Pipeline marker and signage maintenance
- Line locate, excavation, shoring, and backfill requirements
- Pipeline right-of-way inspection
- Procedures for accessing special areas
- Development encroachment surveillance
- Pipeline depth of cover surveys
- Leak surveys
- Electrical safety
- Welding safety
- Lifting procedure
- Cathodic protection and corrosion prevention surveys
- Anode replacement procedure
- Odour level testing
- Gas sampling and quality testing
- Procedure for making pipeline piggable
- Maintenance pigging operation
- In-line inspection -- smart pigging
- Portable pigging procedure
- Aboveground pipeline valve inspection and maintenance
- Aboveground piping and fitting maintenance requirements and procedures
- Pipeline failure investigations
- Flaring and purging
- Steel pipeline repair
- Pressure testing and energizing procedures
- Pipeline relocation procedure
- Procedure for reactivating pipeline after shutdown
- Crossing procedures (water, pipeline, underground utilities, railway tracks, etc.)
- Third party observation procedures
- Record keeping guidelines
- Emergency Response Plan (ERP)
- Development of maintenance manual
- Training requirements for NRG personnel (Technical & Safety training needs)
- Community awareness programs (Call before you dig!)
- Any additional requirements through review of CAN/CSA-Z662 Standards and feedback from TSSA.

Approach to Development of Pipeline Maintenance Protocol

Suggested approach to the development of this protocol includes:

- Meetings with NRG staff to identify the scope of each element or module.
- Create a draft document of the results.
- Seek and obtain acceptance from NRG staff.
- Upon receipt of acceptance and approval from NRG to proceed, initiate the development of written procedure for each element or module.
- Present final draft documents to NRG for approval.

Proposed Work Plan

It is expected that all documents associated with the Pipeline Maintenance Protocol will be developed to their final form for submission to TSSA within a period of 44 working days. The work plan will include provisions for meetings with NRG staff, site visits, and review, critique of draft documents by NRG staff, and subsequent revisions of documents to their final form.

A general description of work activities are described below. A budgetary man-hour and cost estimate can be found in Schedule "B" of this document.

Phase 1 – Kick-Off Meeting and Scoping

Existing pipeline information, design parameters and as-built drawings will be reviewed to gain a thorough understanding of the pipeline system and routing.

A one-day meeting with NRG staff and field visit of the entire pipeline right-of-way should be conducted. A detailed deliverable list with document titles will be prepared for approval by NRG. Preferred format, document numbering system and nomenclature for the Pipeline Maintenance Protocol should also be determined at this stage.

Estimated duration: 2 working days (includes one meeting and one site visit)

Phase 2 – Development of Draft Pipeline Maintenance Protocol

The team will systematically develop all draft documents that form the Pipeline Maintenance Protocol. Detailed steps and procedures required to complete all tasks and activities in the maintenance of the steel pipeline will be drafted in accordance with legislation and/or best industry practices and forwarded to NRG for review, comment, and mark up.

The estimated duration below does not include days associated with the review of draft documents by NRG staff.

Estimated duration: 28 working days (includes 3 teleconference calls)

Phase 3 – NRG Review of the Draft Pipeline Maintenance Documents

The Draft Pipeline Maintenance documents are to be reviewed by NRG staff. Comments and mark-ups are to be forwarded to AUE for final revision.

Estimated duration: 2 working day (to field questions from NRG staff)

Phase 4 – Document Revision

Upon receipt of comments and mark-ups from NRG staff, AUE is to perform necessary revisions to the maintenance protocol and submit hard copies of the finished product to NRG for final approval.

Estimated duration: 10 working days (includes 2 teleconference calls)

Phase 5 – Submission to TSSA

AUE will submit the maintenance protocol documents on behalf of NRG to TSSA for their review, comments and acceptance.

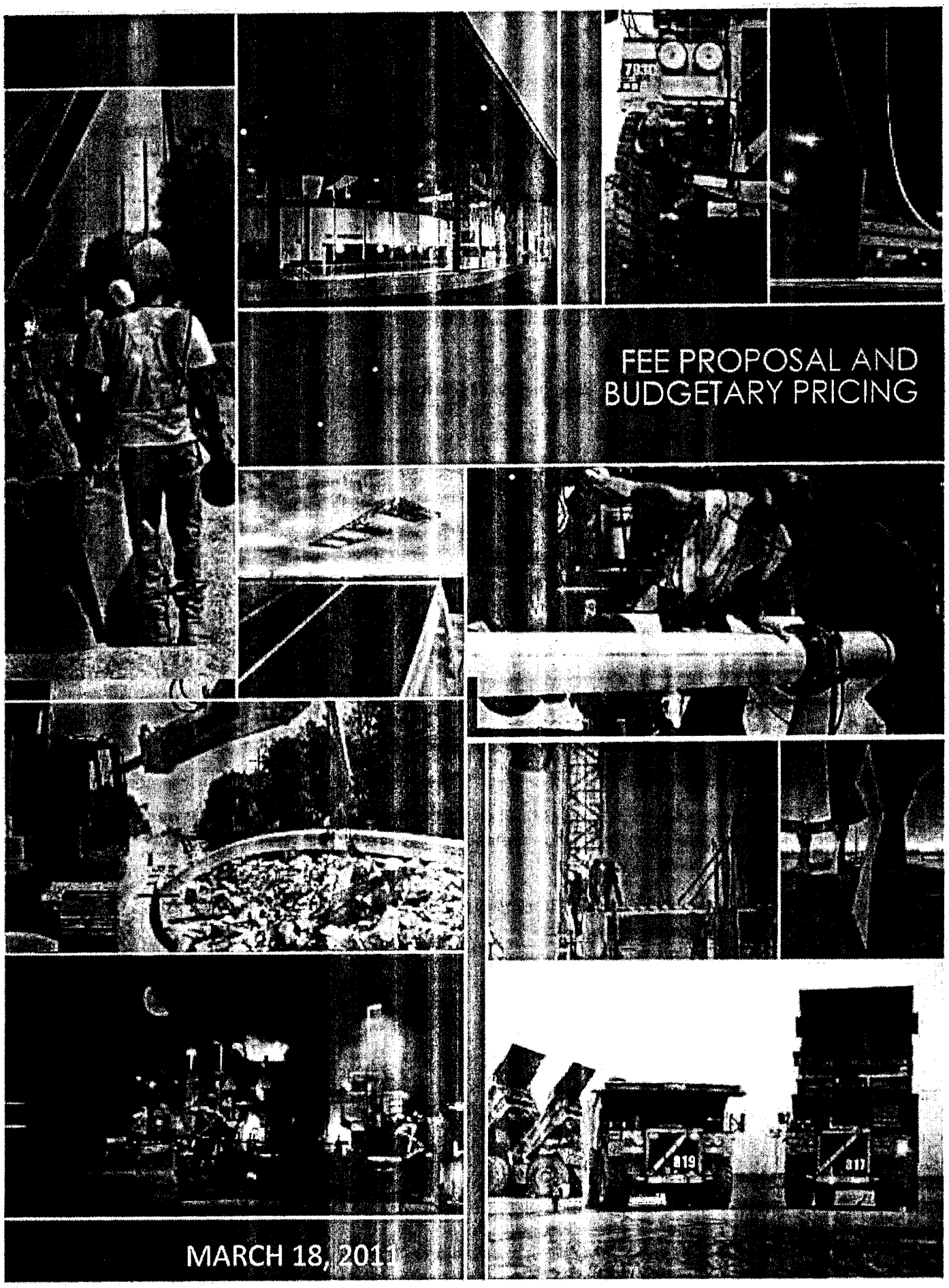
AUE will revise submitted documents per TSSA comments, if required.

Estimated duration: 2 working days

Optional Additional Services

AUE would also be pleased to provide pricing to NRG for either or both of the following additional services:

- Training & Awareness Services through the development and delivery of the agreed training program(s) to verify competency for each task based on determined and required deliverables
- Drafting the complete request for tender package for the Phase 2 RFP "including developing contract documents



FEE PROPOSAL AND BUDGETARY PRICING

MARCH 18, 2011

Fee Proposal and Budgetary Project Pricing

Please refer to Schedule "B" on the following page for an estimated hourly breakdown of the project. Our preliminary budgetary pricing for this work is $169,545 (HST included) which includes a 10% contingency rate.

Please note that our budgetary pricing for this work is for estimating and budgetary purposes only. As such, all worked hours contributing to the successful creation of the Pipeline Maintenance Protocol will be invoiced on a time and material basis using the rates provided in this proposal.

Hourly Rates and Budgetary Project Pricing

The proposed schedule of hourly rates will apply for this project:

Project Director	$168/hr
Project Manager	$136/hr
Senior Project Engineer	$136/hr
Technical Writer	$115/hr
CAD Technician	$ 65/hr

Travel and Other Expenses

Mileage will be charged at a rate of $0.50 per km. Additional disbursements will be charged at a rate of cost plus 15.0%.

AUE
Utility Engineering

NATURAL RESOURCE GAS LIMITED
Proposal to Develop a Maintenance Manual for the Ethanol Pipeline

SCHEDULE "B"

STAGE	TASK	PROJECT DIRECTOR [$168/hr]	PROJECT MANAGER/ SENIOR ENGINEER [$136/hr]	TECHNICAL WRITER [$115/hr]	CAD TECHNICIAN [$65/hr]	TRAVEL [$0.50/km]	EXPENSES [Cost + 15%]	TOTAL [hr]	SUB-TOTAL [$]	CONTINGENCY [+ 10%]	TOTAL [$]
Stage 1	Kick-Off Meeting and Scoping	1	20	20		400	$117.88	41	$5,505.88	$550.59	$6,056.46
Stage 2	Development of Draft Dcouments	1	100	780	32	100	$2,624.88	913	$108,222.88	$10,822.29	$119,045.16
Stage 3	NRG Review of Draft Documents		8	8			$46.00	16	$2,054.00	$205.40	$2,259.40
Stage 4	Document Revision		48	80	8		$391.00	136	$16,639.00	$1,663.90	$18,302.90
Stage 5	Submission to TSSA	2	16	12			$86.25	30	$3,978.25	$397.83	$4,376.08
	TOTAL [hr]	4	192	900	40	-	-	1136	-	-	-
	TOTAL [$]	$672.00	$26,112.00	$103,500.00	$2,600.00	$250.00	$3,266.00	-	$136,400.00	$13,640.00	$150,040.00 (before tax)

TOTAL (HST included) = $169,545.20