Presentation Agenda

Field and Plant History

Formation of the Abandonment and Reclamation Team

Project Updates:

- Plant Abatement Project
- Plant Demolition Planning
- Sulphur Basepad Removal
- Well Site Demolition and Abandonment

Lessons Learned
Balzac Field History

• The first discovery wells were drilled in 1956, a total of 125 (includes 5 D&A wells) wells were drilled & produced

• The Balzac Gas Plant was built in 1961 and expanded in 1967, processing over 3 Tcf of gas over its long & successful life

• Field covers ~400 square kilometers, running ~35 km north to south and ~20 km east to west

• Rapid urbanization has resulted in third-party utilities (power, cable, telephone, gas, water, sewer, rail ways) present throughout the field
Gas Plant site prior to 1960

Is this where you would build a gas plant?
Balzac Plant History

• 1961 – Plant startup - Petrogas Processing (28 owners) – Jefferson Lake Petrochemicals
• 1965 – Liquefied Petroleum Gas (LPG) unit added
• 1967 – Additional Gas Treating and Sulphur Recovery added
• 1974 – Inlet Compression (250 mm/scfd raw gas capacity) added
• 1975 – Sulphreen Unit added to meet regulatory requirements
• 2001 – 2002 – Addition of Balzac Power Plant
• 2003 – 2004 – Slating to Prilling of solid sulphur.
• 2009 – South Sulphur Plant Mothballing, Unsuccessful Parkway Drilling
• 2010 – Decision to close gas plant, 1 Year for planning
• 2011 – Plant Closure, Shutdown and Decommissioning Begin
Balzac Plant History

Abandonment and Reclamation Team

• Team dedicated to the execution of the Balzac Abandonment and Reclamation project
  • Multi-disciplined team comprised of environmental professionals, engineers, project managers and various consulting specialists
  • Formed prior to the shutdown of the Balzac Gas plant and has continued to grow as the scope of the entire program has developed
Program Scope

Gas Plant (~420 acres)

- Asbestos abatement
- Structural demolition
- Site assessment and remediation
- Ongoing power station operations
- Adjacent development and infrastructure crossing Nexen property
- End land use and closure decisions

~60 Inactive wells

- Well abandonment (30 - 45 days of rig time)
- Surface facility demolition
- Pipeline suspension and abandonment (~200 km)
- Site remediation and reclamation
- Access road remediation and reclamation
- Ongoing production (diversion) and development (Viking) opportunities

Benchmarking scope & performance is difficult as there are very few analogous fields & plants with the same proximity to urban residential & commercial developments.
Balzac Timeline and Workstreams

Balzac A&R Program (as of Q3 2012)

<table>
<thead>
<tr>
<th>Plant</th>
<th>2011</th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4 2012</th>
<th>2013</th>
<th>2014</th>
<th>2015 +</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulphur Base Pad</td>
<td>Plan</td>
<td></td>
<td></td>
<td>Execute</td>
<td>Closeout</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abatement</td>
<td>Plan</td>
<td>Execute</td>
<td></td>
<td>Closeout</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DLR</td>
<td>Execute</td>
<td></td>
<td>Approval</td>
<td>Maintain</td>
<td>Plan Renewal</td>
<td>Approval</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demolition</td>
<td>Plan</td>
<td>Execute</td>
<td></td>
<td>Closeout</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industrial Run-off</td>
<td>Plan</td>
<td>Execute</td>
<td>Evaluate</td>
<td>Plan</td>
<td>Execute</td>
<td>Maintain</td>
<td></td>
<td></td>
</tr>
<tr>
<td>McDonald Lake</td>
<td>Plan</td>
<td>Execute</td>
<td></td>
<td>Evaluate &amp; Maintain</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reg. Compliance</td>
<td>Plan</td>
<td></td>
<td></td>
<td>Execute &amp; Maintain</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Waste</th>
<th>2011</th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4 2012</th>
<th>2013</th>
<th>2014</th>
<th>2015 +</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessment (plant)</td>
<td>Plan</td>
<td>Execute Stage I</td>
<td>Stage II</td>
<td>Stage III</td>
<td>Stage IV</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assessment (field)</td>
<td>Plan</td>
<td>Execute Phase I (21)</td>
<td>Phase I (44) Phase II (16)</td>
<td>Phase II (20)</td>
<td>Phase II (30)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Waste Treatment Fac.</td>
<td>Plan</td>
<td>Execute WIP (Legacy sites)</td>
<td>2013 - Execute</td>
<td>2014 - Execute</td>
<td>2015+</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rem/Rec/ Closure</td>
<td>Execute WIP (Legacy sites)</td>
<td>2013 - Execute</td>
<td>2014 - Execute</td>
<td>2015+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Field</th>
<th>2011</th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4 2012</th>
<th>2013</th>
<th>2014</th>
<th>2015 +</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field Surface Facilities Demolition</td>
<td>Plan</td>
<td>Execute (18)</td>
<td>2013 – Execute (34)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pipeline Abandonment</td>
<td>Plan</td>
<td>Execute</td>
<td>Execute</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Well Abandonment</td>
<td>Plan</td>
<td>2012 ~ 6 Wells</td>
<td>12 Wells</td>
<td>20 Wells</td>
<td>19 Wells</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other</th>
<th>2011</th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4 2012</th>
<th>2013</th>
<th>2014</th>
<th>2015 +</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Station</td>
<td>Plan</td>
<td>Execute Gas Line</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Utilities</td>
<td>Define</td>
<td>Execute Gas Line</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Project Updates

• Plant Abatement
• Plant Demolition Planning
• Sulphur Basepad Removal
• Field Demolition and Well Abandonment
Abatement
Abatement – Project Scope

- Removal of all **exterior** asbestos and non-asbestos insulation within the plant
- High percentage of work from man-lifts and scaffold builds
- Transport and Disposal of material to a Nexen approved landfill location
- Industrial hygiene monitoring for all asbestos activities that are occurring on site
Abatement - Project Progress

- All major towers (excluding LPG area) have been completed to date
- Major containments have been completed in sulphur area (converter beds, large diameter pipe, etc.)
- Work is ongoing in two large buildings (treater / boiler house)
- Significant progress made in pipe racks and other process piping
Abatement – Containments
Abatement – Manlift Work
Abatement – Industrial Hygiene Monitoring

• All industrial hygiene monitoring on Balzac site performed through a 3rd party consultant
  • Responsibilities of consultant includes ensuring compliance with work procedures, completing air monitoring, and supporting Nexen in determining responses to high readings
  • Nexen has had detailed discussions with Occupational Health & Safety in regards to abatement techniques
• Continuously evaluate air results to ensure consistent performance
Abatement – Owner Considerations

• How much control do you want? Prime vs. Not Prime

• Are you willing to consider non typical work-procedures?

• Are your responders ready to handle an incident in a high risk enclosure?

• Understand the limitations of your own HSE manual and be very specific in how you want the work performed

• Educate your management early, the work force and activities is not-typical for industrial sites at this scale

• Contract must match your plan, philosophy and performance metrics
Plant Demolition
Plant Demolition – Project Scope

• Removal of all surface facilities (towers, buildings, vessels and equipment)
• Transport and Disposal of waste materials to a Nexen approved landfill location
• Segregation and recovery of scrap metals

• **Out of Scope**: Underground tanks and piping, incinerator stacks, facilities that will be used for future remedial efforts
  - Scope of below ground work is difficult to define
  - Removing the buildings and equipment will enhance ability to assess underlying contamination
Plant Demolition – Site Preparation

- Plant decommissioning
  - Cleaning of process piping
  - Isolation of electrical sources
  - Updating plant drawings
- Hazmat Removal
  - Removal of accessible asbestos
  - Removal of accessible hazardous wastes (PCB, Chemicals, Mercury, etc)
- Sale of reusable equipment & inventory
  - To date ~\$2.5 Million Recovered
  - Nexen has a dedicated Salvage Coordinator that looks at all Canadian assets
Plant Demolition – Understanding Volumes and Weights

- Assess the plant site to understand material volumes
  - Either internal or 3rd party estimate
  - Assessment should be done of all major vessels, process equipment and buildings
  - Estimate volumes of steel, concrete, etc. to be demolished / processed / recovered

- Break down by process area
  - Each area of the plant process will have its own inherent issues, it is good to understand what portion of this metal may not be recoverable
    - Examples: Sulphur plant piping plugged with Sulphur, LPG unit with norm contamination
Plant Demolition – Understanding Your Contamination

• Recovery is dependent on contamination that may be present in equipment / metal
  • PCB’s in transformers have increased disposal costs
  • NORM’s in piping and equipment may require costly disposal at a remote landfill
  • Piping that is solid with sulphur will not be accepted by a scrap dealer and will be costly to dispose of

• Techniques for dismantling / demolition may be affected by contamination
  • Residual Sour Gases (H2S)
  • Flammable Materials (Methane, Sulphur, Etc.)
Nexen has decided that we would like to retain prime onsite during demolition

- Balzac Power Station is still operational and in proximity of critical work areas
- Surface water management and other operational activities will still be coordinated by Nexen
- Anticipating significant amount of survey work, excavation work, etc. to be occurring on other areas of the plant site
Sulphur Basepad Removal
Sulphur Basepad Removal – Project Scope

- Maximise recovery of sulphur that is present in the sulphur basepad
  - Focus on reuse of materials and limiting volumes that are sent to landfill
  - Analyze different methods of sulphur recovery
- Estimated ~25,000 – 30,000 tonnes of spec sulphur (>99.7%)
- Estimated ~50,000 – 100,000 tonnes of off-spec sulphur (<99.7%)

**Note:** Basepads at Balzac were formed by pouring molten sulphur onto bare ground. Therefore depths of material varies greatly throughout the basepad
Sulphur Basepad Removal – Economics

- Current sulphur market has netted a positive sale price for material in Balzac
  - ~13,000 tonnes sold at positive price at plant gate in separate sales
  - Costs for excavation additional
- Costs to dispose of sulphur through a landfill are currently high
  - Need to understand break even of on-site services and sale vs. expected cost of disposal services
Sulphur Basepad Removal – Bagged Sulphur

- Nexen is investigating selling off-spec sulphur in the international market
  - Cost analysis will be completed against landfilling of material vs. sulphur bagging operation
  - Low volume, high cost work
  - Cost looks comparable to landfill but discount seems minimal
    - Considerations around risk of transport and acceptance of spec
Sulphur Basepad Removal – Considerations

- Critical front end planning in an urban environment:
  - Dust mitigation
  - Fire control
  - Emergency Response
  - Monitoring of hazardous gases
- Consider how the sulphur surface is contoured to ensure minimal collection of acidic water
- Understand ownership transfers for material that has been sold into the market
Well Site Demolition and Abandonment
Wellsite demolition program was initiated prior to the abandonment of well.

Most wellsites included a small amount of asbestos abatement, structural demolition and salvage of materials, recovery of glycol and cleanup of debris on site.

Significant reduction in costs from past “one-of” programs due to larger volume of work.
Well Site Demolition and Abandonment – Job Scope

- Many of the Balzac wells are in proximity to urban development; which adds operational complexity and requires stakeholder engagement to ensure operational success.

- Abandonment priority considers proximity to residential and industrial development, in addition to wellbore integrity, access constraints, surface rental issues, etc.

- The execution plan includes initiating work in 2012 and then carrying directly into 2013 as a continual program.
Lessons Learned
#1) The Human Element is of the utmost importance
- More than just the facility staff are affected
- Emotional ties run deep
- Resistance to change impacts safety & performance

#2) Benefits of planning in advance
- The greatest potential to influence the outcome is at the start
- Campaign efficiencies cannot be realized without planning
- Planning assists in ensuring high level of stakeholder engagement, making execution smooth & efficient
#3) Benefits of a sustained dialogue & joint problem solving with regulators can not be understated

- Projects of this nature have unique challenges & opportunities that require co-operation to develop creative & effective solutions
- Understanding the intent of the regulations is important It takes time & effort to build and maintain trust
- There are many regulators to include in the dialogue (ERCB, ESRD, municipalities, Infrastructure, etc).
Lessons Learned - Program

#4) Leveraging partner & industry experience

- Accessing a larger knowledge base creates value for all participants (e.g. asbestos learning, well abandonment efficiency)
- There is no information hoarding or competitive advantage in the A&R realm

#5) Costs of base-line compliance

- These carrying costs may not be well understood initially, further incentive to proceed with timely abandonment & reclamation
- Estimated base-line compliance as a “lock & walk” scenario, the minimum resources necessary to remain in compliance
Lessons Learned - Program

#6) There are disincentives associated with non-landfill remediation

• Landfilling severs future land use & development conflict risk

• Landfilling remains the low cost “remedial technology”

#7) The value of internal education

• A&R is a non-core activity so the enterprise lacks the models & frame of reference to quickly & efficiently make A&R related decisions

• Many of the lessons learned can be applied at the front of the life cycle to create value from the beginning
#8) Understand your contractual commitments before you shut down your business

- This includes utility contracts, lease & rental agreements, operating agreements, etc.
- If possible, match contract termination to the expected closure window

#9) Common language ("definitions") is important

- "Decommissioning means different things to different people"
- Some terms have different meanings under different regulations
- A common language helps achieve and maintain team & stakeholder alignment
Lessons Learned - Plant

#10) Complexity & value of a proper Shut-Down, Decommissioning & Salvage project

- A shut-down program requires more planning than a turn-around
- Retaining staff can be beneficial (knowledge) and detrimental (old habits), change management is critical

#11) Accelerated house-keeping practices and rationalization of bone-yards as a large facility or field nears the end of its life has value

- Leverages a larger work-force to get labor intensive work completed
- Reduces post-shut-down site maintenance costs & security concerns
- Can have positive impacts on site logistics, traffic management, etc.
Lessons Learned - Plant

#12) Limited value of salvage

- The costs of preservation & recovery may exceed the sale price
- The market for used goods is limited and time sensitive

#13) Inventory should be managed “just in time” as a large facility or field nears the end of its life

- Unused inventory may be worth 20% or less of purchase price, not including the costs of holding, maintaining and selling it
#14) Joint infrastructure

- Tying plants & facilities together may save capital and operating costs, but it creates additional expenses and operational & regulatory complexities at the time of shut-down

- Integrated facilities decreases the options for the facilities

- Consider the “end of life” when making investment decisions
#15) Off-spec sulphur & the value of waste minimization

- There is value to be realized from non-traditional markets
- Different operating practices (e.g. liners, small volume static remelter) may have reduced or eliminated this exposure
#16) Impacts to A&R efficiency resulting from land development pressures
- Erodes ability to select optimal timing & technologies
- Restricted site access & working hours

#17) The value of regional soil & groundwater background data can not be understated
- Expedites closure of contaminated & reclaimed sites
- Cost savings realized by not chasing “false positives”
#18) Proper well suspensions create savings opportunities at the time of abandonment

- Verification of site conditions & wellhead/equipment configurations
- Opportunity to log known or suspect wells
- Placement of bridge plugs & barriers in appropriate locations
“The process of shutting down a sour gas plant & field is complex, but achievable with the proper investment of people, time, and resources, including dialogue & coordination between ourselves, partners, regulators & community stakeholders.”