Algar Lake SAGD Project
2013 In Situ Performance Presentation
April 16, 2013
Forward-Looking Statements

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There are significant differences in the criteria associated with the classification of reserves, prospective resources and contingent resources. Contingent resources and prospective resources estimates involve additional risks, specifically the risk of not achieving commerciality and exploration risk, respectively, not applicable to reserves estimates. No adjustments for these risks have been made in the groupings of reserves and recoverable resources.

All reference to dollars in this presentation should be assumed to refer to Canadian dollars, unless otherwise noted. All references to reserves and or resources represent Grizzly’s interest in reserves and resources prior to the deduction of Crown royalties, unless otherwise noted.
Outline and Presenters

- Introduction and Project Background – Alan Stroich
- Geoscience – Andrew Couch
- Drilling and Completions – Alan Stroich
- Scheme Performance – Alan Stroich
- Facility and Process Description – Kristian Nespor
- Measurement and Reporting – Kristian Nespor
- Water – Kristian Nespor
- Environmental and Regulatory Compliance – Kristian Nespor
800,000+ Net Acres of Alberta Oil Sands Leases

Grizzly Oil Sands Lease
Other Oil Sands Lease
Alberta Oil Sands Areas
Producing Thermal Project
Under Construction Thermal Project

- City of Peace River
- City of Fort McMurray

= 1 township (6 miles x 6 miles)
• A 100% W.I. in 56,960 contiguous acres of oil sands leases in the southern Athabasca region

• GLJ has assigned 114 mmbbls of 2P Reserves and 35 mmbbls of Contingent Resources

• The Algar development area has been extensively explored
  • 65 cored delineation wells and an additional 16 appraisal exploration core holes outside of the initial development area.

• Reservoir characteristics
  • Up to 20 metre thick bitumen pay
  • No bottom water or top gas
  • Continuous caprock over 40 metres thick
  • Identified makeup water source for Stages 1 & 2

• Expansion potential
  • 18+ metre thick bitumen pay outside of the initial development area
Development Area Subsurface Drainage Patterns

Well Types
- Existing Observation Wells
- Proposed Observation Wells
- Mini-frac Well
- OSE Wells
- Existing Pad B SAGD wells
- Proposed SAGD wells
- Algar Development Area
- Proposed Drainage Areas
Initial Development

- Application for a 1,800 m³/d steam assisted gravity drainage (SAGD) commercial scheme submitted March 3, 2010

- Scheme Approval No. 11688 received on November 21, 2011

- Amendment No. 11688A received November 15, 2012 – slightly expanded Development Area

- Project being developed in two 900 m³/d stages
  - Stage 1 consists of one process train and one well pad with 10 SAGD wellpairs

- Modular plant design “ARMS” – Advanced, Re-locatable, Modular, Standardized

- Access road construction commenced January 2012

- Pad B drilling and completions from March to September, 2012

- Stage 1 plant site commissioning underway

- First steam to wells by July, 2013
Geoscience
Reference Well 1AA/01-15-085-12W4/00
Surface to TD

Quaternary
Westgate Formation
Viking Formation
Joli Fou Shale

Grand Rapids Formation

Clearwater Formation
Wabiskaw “A”
Wabiskaw “D”
McMurray “C” Channel Sand
Devonian

Reference Well Location
Reference Well 1AA/01-15-085-12W4/00
Zone of Exploitation

Algar Lake Stratigraphy

- Clearwater (Caprock)
- Wabiskaw A
- Wabiskaw C
- Wabiskaw D
- McMurray C (Reservoir)

- Shale
- Sand
- Sands and Muds
- Sand Rich Channel

Reference Well Location

- Wabiskaw Marker
- Wabiskaw “A” Sand
- Wabiskaw “A” Shale
- Wabiskaw “C” Top
- Wabiskaw “D” Top
- McMurray Top
- Top of Pay
- Base of Pay / Devonian
Wells with Core Map and 3-D seismic boundary polygon.
Grizzly Oil Sands

McMurray Net Pay Map

Algar Lake OBIP Estimates Million M³

<table>
<thead>
<tr>
<th>Net Pay Thickness</th>
<th>Development Area</th>
<th>Project Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;10m</td>
<td>20.2</td>
<td>60.0</td>
</tr>
<tr>
<td>&gt;15m</td>
<td>18.1</td>
<td>40.5</td>
</tr>
</tbody>
</table>

Average Porosity 33% & So 75%

Grizzly Oil Sands Algar Lake Lease Boundary
Algar Lake Project Area Boundary
Algar Lake Development Area Boundary
Algar Lake Initial Drainage Area Polygons
Algar Lake Central Processing Facility Site

Algar Lake
Net McMurray Pay

Author: Andrew Couch
C.I.: 2.5 m
Date: 8 February, 2013
Scale: Revised:
McMurray Top Pay Structure Map

300m TVDSS = 230m TVD
Azimuthal Deep Resistivity (ADR™ *) Based Mapping

Devonian Structure from ADR Trajectories and Vertical Well Control.

ADR geosteering of producer wells allows for precise well placement above the Devonian to maximize resource recovery. No well contacted the limestone.

A Halliburton Product
Structural Cross-Section A- A’

With Horizontal Well Projections

**Proposed**
Pad A Producer and Injector well profiles

**Actual**
Pad B Producer and Injector well profiles

* Devonian Surface from well control and ADR trajectory data.

Grizzly Oil Sands

Algar Lake In-Situ Oil Sands Scheme 11688A

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High Quality Reservoir
Algar Lake

Gamma Ray Logs Along Horizontal Well Trajectories

Excellent Reservoir Quality over Entire Well Length
Vertical Permeability from bioturbated Wabiskaw D sands are very low <1 md.

Vertical Permeability range from 4 Darcies in clean zones to <1 md in mud rich intervals. Data from Overburden and full core tests.
Cap Rock Integrity

- Mini-frac tests were performed on 5-15-85-12W4 in 2011

<table>
<thead>
<tr>
<th>Formation</th>
<th>TVD (m)</th>
<th>Min. Stress MPa</th>
<th>Min. Stress kPa/m</th>
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</thead>
<tbody>
<tr>
<td>Clearwater Shale</td>
<td>190.0</td>
<td>3.86</td>
<td>20.32</td>
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<tr>
<td>Clearwater Shale</td>
<td>204.0</td>
<td>4.42</td>
<td>21.67</td>
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<tr>
<td>McMurray C</td>
<td>237.0</td>
<td>4.77</td>
<td>20.13</td>
</tr>
</tbody>
</table>

- Minimum overburden coverage is 195m, average minimum stress gradient in Clearwater shale caprock is 21.0 kPa/m

- Fracture pressure at base of caprock is 4,095 kPa

- Maximum approved steam chamber operating pressure is 3,100 kPa, equal to 75.7% of caprock fracture pressure

- 2,200 kPa is the planned operating pressure
Drilling and Completions
Drilling and Completions
Pad B and Associated wells

Pattern B Observation Wells

1. 100/04-14-085-12W4
2. 100/03-14-085-12W4
3. 111/07-14-085-12W4

Wells Numbered South to North.
B1 P/I through B10 P/I
• Initial development consists of 10 SAGD wellpairs in the B pattern

• Horizontal well lengths range from 800 to 900m, total drilled lengths of 1,240m to 1,380m

• Interwell spacing of 65m

• Wellhead spacing of 15m, spud angles average 30 degrees

• ADR tool used to help steer the production wells relative the Devonian surface

• Injectors ranged to producers based on target separation, typically 5m to 6m

• Very few problems encountered during drilling, good directional control achieved

• Good cement bond quality on all injectors and producers
Drilling and Completions
SAGD Wells

Insert wellbore schematics of SAGD wellpairs

<table>
<thead>
<tr>
<th>Injector</th>
<th>Size (mm)</th>
<th>Weight (kg/m)</th>
<th>Landed (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface</td>
<td>408</td>
<td>96.73</td>
<td>80 m TVD</td>
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<tr>
<td>Intermediate</td>
<td>238.8</td>
<td>89.23</td>
<td>510 mMD</td>
</tr>
<tr>
<td>Liner</td>
<td>219.1</td>
<td>47.62</td>
<td>--</td>
</tr>
<tr>
<td>Long Tubing</td>
<td>88.9</td>
<td>13.69</td>
<td>10m from toe</td>
</tr>
<tr>
<td>Short Tubing</td>
<td>88.9</td>
<td>13.69</td>
<td>15m above Liner</td>
</tr>
<tr>
<td>Instrumentation</td>
<td>19.1</td>
<td>--</td>
<td>5 m from toe</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Producer</th>
<th>Size (mm)</th>
<th>Weight (kg/m)</th>
<th>Landed (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface</td>
<td>339.7</td>
<td>81.1</td>
<td>80 m TVD</td>
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<tr>
<td>Intermediate</td>
<td>244.5</td>
<td>59.53</td>
<td>510 mMD</td>
</tr>
<tr>
<td>Liner</td>
<td>177.8</td>
<td>38.7</td>
<td>--</td>
</tr>
<tr>
<td>Long Tubing</td>
<td>101.6</td>
<td>14.14</td>
<td>x-over</td>
</tr>
<tr>
<td>Short Tubing</td>
<td>101.6</td>
<td>14.14</td>
<td>x-over</td>
</tr>
<tr>
<td>Instrumentation</td>
<td>19.1</td>
<td>--</td>
<td>5 m from toe</td>
</tr>
<tr>
<td>Lift Gas (Long)</td>
<td>25.4</td>
<td>--</td>
<td>Heel</td>
</tr>
<tr>
<td>Lift Gas (Short)</td>
<td>38.1</td>
<td>--</td>
<td>Toe (ports at heel)</td>
</tr>
</tbody>
</table>

TVD estimate: 287 m
Injector/Producer spacing: 5 m
Well Pair Spacing: 65 m
Drilling and Completions
Artificial Lift

• Production wells will use natural steam lift supplemented with gas lift

• Pump tangents included in SAGD producer trajectories
Drilling and Completions
Observation Wells

- Three instrumented observation wells drilled into the B pattern

Instrumentation

- 04-14 and 07-14
  - 21 Thermocouples and 2 piezometers per well
- 03-14
  - 18 Thermocouples and 2 piezometers
- Two observation wells are available for future cased hole logging
Pad B Observation Well 111/07-14-085-12W4

7-14 Observation well ~23m from the B9 well pair.
4-14 Observation well ~10m from the B9 well pair at the producer level.
Pad B Observation Well 100/03-14-085-12W4

3-14 Observation well ~15m from the B4 well pair at the producer level.
Pad A Observation Well 100/16-10-085-12W4

00/16-10-85-12W4

Wabiskaw A Top

Wabiskaw C Top

Wabiskaw D Top

McMurray Top

Top of Pay

Devonian

Piezometer Sensor 223m

Piezometer Sensor 240m

Thermocouple Sensors (2m Spacing)

100/16-10-085-12W4 Pad A Observation Well

Algar Lake In-Situ Oil Sands Scheme 11688A
Scheme Performance
Scheme Performance

- No production history
- Facility is non-operational
Steam injection surface specifications:
- Pressure 2,200 – 2,800 kPag
- Temperature 220 – 232 °C
- Pad Steam Quality Target 100%

Pad B is next to CPF, so steam transport issues are not expected.

No immediate plans to inject solvents or non-condensable gases with the steam.
## Pad Bitumen Resources and Recoveries – 5 Year Well Life Estimated

<table>
<thead>
<tr>
<th>Zone</th>
<th>No. of Well Pairs</th>
<th>OBIP (E^3 M^3)</th>
<th>Bitumen Production (E^3 M^3)</th>
<th>Bitumen Recovery (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PAD B</strong></td>
<td></td>
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<tr>
<td>Total McMurray C Sand</td>
<td>2793.6</td>
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<td></td>
<td>47</td>
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<tr>
<td>Total McM C Below Producers</td>
<td>178.3</td>
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<tr>
<td>Total McM C Sand Above Producers</td>
<td>2615.3</td>
<td>1308</td>
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<tr>
<td>Average Well</td>
<td>10</td>
<td>261.5</td>
<td>131</td>
<td>50</td>
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<tr>
<td><strong>PAD A</strong></td>
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<td></td>
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<tr>
<td>Total McMurray C Sand</td>
<td>2457.9</td>
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<td>48</td>
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<tr>
<td>Total McM C Below Producers</td>
<td>142.8</td>
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<td></td>
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<tr>
<td>Total McM C Sand Above Producers</td>
<td>2315.1</td>
<td>1190</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Well</td>
<td>10</td>
<td>231.5</td>
<td>119</td>
<td>51</td>
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<tr>
<td><strong>PAD C</strong></td>
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<td></td>
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<tr>
<td>Total McMurray C Sand</td>
<td>2441.9</td>
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<tr>
<td>Total McM C Below Producers</td>
<td>172.2</td>
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<tr>
<td>Total McM C Sand Above Producers</td>
<td>2269.7</td>
<td>1190</td>
<td></td>
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<tr>
<td>Average Well</td>
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<td>52</td>
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<tr>
<td><strong>PAD D</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Total McMurray C Sand</td>
<td>2957.7</td>
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<td>45</td>
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<tr>
<td>Total McM C Below Producers</td>
<td>213.6</td>
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<tr>
<td>Total McM C Sand Above Producers</td>
<td>2744.1</td>
<td>1320</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Well</td>
<td>10</td>
<td>274.4</td>
<td>132</td>
<td>48</td>
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</table>

## Total Bitumen Resources and Recoveries – 5 Year Well Life Estimated

<table>
<thead>
<tr>
<th>Zone</th>
<th>No. of Well Pairs</th>
<th>OBIP (E^3 M^3)</th>
<th>Bitumen Production (E^3 M^3)</th>
<th>Bitumen Recovery (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pads A+B+C+D Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Total McMurray C Sand</td>
<td>10651.1</td>
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<td>47</td>
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<tr>
<td>Total McM C Below Producers</td>
<td>706.9</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Total McM C Sand Above Producers</td>
<td>9944.2</td>
<td>5008</td>
<td></td>
<td>50</td>
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<tr>
<td>Average Well</td>
<td>40</td>
<td>248.6</td>
<td>125.2</td>
<td>50</td>
</tr>
</tbody>
</table>
Facility and Process Description
No modifications have been made to the facility or plot plan since application.
Simplified Process Schematic

No changes since application
Algar Lake Facility Performance

- Currently in construction phase
- No performance to report - not operational
Grizzly’s ARMS Development Model

- Grizzly’s Advanced, Relocatable, Modular, Standardized (ARMS) Development Model uses proven technologies in a more flexible, compact form.
- ARMS will allow Grizzly to exploit smaller bitumen pools and exploit larger pools in 10-15 years vs. 20-30 years in traditional SAGD.
  - 20,000 Bbls/d of steam capacity production
- Reduced cost
  - Shop construction vs. field construction
  - 50% smaller footprint vs. typical SAGD facility
  - Fewer pipe racks – less steel
  - Reuse facilities to reduce total lifecycle costs
- Reduced downtime
  - Two production trains can operate independently
  - Self-generated power
  - Advanced centralized process controls
- Reduced risk
  - Portability allows Grizzly to manage production levels over the life of a reservoir
  - Repeatable and manageable project size reduces execution risk.
Measurement and Reporting
Grizzly Algar is separated into a In-Situ Oil Sands Battery and an In-Situ Oil Sands Injection Facility

MARP initial approval January 2012, annual update approved March 2013

Well Testing
- One test separator for 10 production wells with expected 8-9 hour test durations
- Wells expected to be tested every 4 days
- Stable periods will be chosen from the gross test time interval to ensure accurate results
- A tolerance of +/-10% on volume and water cut will be used to flag test results for further review

AGAR water cut analyzer used for inline water cut analysis with periodic manual samples as a check

All testing will conform to procedures outlined in the approved MARP
Measurement and Reporting
Algar Metering Schematics
Measurement and Reporting
Algar Metering Schematics
Water
Water Source Wells

- Three Lower Grand Rapids water source wells to supply Stage 1 and Stage 2 development
  - 04-02-84-11
  - 10-34-83-11
  - 05-35-83-11

- Diversion Permit No. 00267123-00-00 issued January 13, 2013
  - Annual withdrawal of 230,610 m3 from source wells, plus 30,000 m3 from the storm water retention pond
Water Source Well Locations

[Image of water source well locations map]
## Source Well Approved Maximum Daily Rate

<table>
<thead>
<tr>
<th>Source Well</th>
<th>Approved Maximum Daily Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>04-02-084-11</td>
<td>260 m3/d</td>
</tr>
<tr>
<td>10-34-083-11</td>
<td>263 m3/d</td>
</tr>
<tr>
<td>05-35-083-11</td>
<td>375 m3/d</td>
</tr>
</tbody>
</table>

**Diagram:**

- **Surface Casing:** 244.5 mm (9 5/8")
- **Intermediate Casing:** 177.8 mm (7")
- **Electric Submersible Pump**
- **Wire Wrapped Screen:** 114 mm (4.5")
- **Lower Grand Rapids Formation**

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**Grizzly Oil Sands**

Algar Lake In-Situ Oil Sands Scheme 11688A
Water Disposal

• Disposal Water

• No onsite industrial wastewater disposal

• Concentrated brine and miscellaneous waste water will be trucked to ERCB approved third party waste water disposal facilities

• Drum boiler / evaporator system produces concentrated brine at low volumes (3% of boiler feed water volumes)

• Disposal volumes expected to conform to Directive 81 limits
Environmental and Regulatory Compliance
Environmental and Regulatory Compliance
Sulphur

- EPEA Approval No.266433-00-00
  - SO₂ emissions – 1.05 tonnes/day total for Stages 1 and 2
  - Four passive monitoring stations installed for SO₂ and H2S in Algar area

- Algar Lake facility not designed for sulphur recovery
Environmental and Regulatory Compliance Approvals

- ERCB Commercial Scheme Approval No. 11688A
  - Amendment No. 11688A issued Nov. 15, 2012 – slightly expanded Development Area

- ERCB Directive 051 Approval issued December 10, 2012
  - Maximum wellhead injection pressure of 3,100 kPag

- EPEA
  - Approval No. 00266433-00-00
  - CEMS requirement on Drum Boiler
  - Soil Monitoring and Ground Water Monitoring programs in place

- ASRD
  - Approval No. 00267123-00-00 issued January 13, 2013 – Water diversion permit for 3 source water wells and storm water retention pond

- DFO
  - Committed to regular monitoring of Little Horse Creek
Environmental and Regulatory Compliance
DFO - Surface Monitoring

• Little Horse Creek will be surveyed every 3-6 months to monitor any potential changes to fish habitat

• Surveys conducted to conform to DFO requests for impact monitoring
Environmental and Regulatory Compliance
Events

• ERCB
  • As Drilled SAGD B1 well pair extend beyond development area
    • Scheme amendment application and approval Nov 15, 2012
  • 2 cased Algar OBS wells initially licensed as OSE wells
    • Licenses amended Jan 2 2013

• EPEA
  • Sediment into Creek due to silt fence failure
    • Remediated, modifications implemented to prevent future occurrences
  • Domestic wastewater spill
    • Contained onsite, cleaned-up, procedures adjusted to prevent future occurrences
  • Exceeded daily allowable withdrawal from water source well used for SAGD drilling
    • Procedures adjusted to prevent future occurrences
Grizzly Oil Sands is in full compliance with regulatory requirements and approvals.
Future Plans

- Algar Lake Stage 1
  - Operational – Q2/Q3 2013
  - Ramp up 2013-2014

- Algar Lake Stage 2
  - Approved with original application
  - Waiting on corporate sanction

- Future Algar Lake Pads E-L
  - Require application amendment of development area
Thank You