shear diamonds

# Jericho Diamond Mine, 2AM-JER0410

## Type A Water License Renewal

Public Hearing – Community Presentation
Kugluktuk, NU
Nov. 30 – Dec. 1, 2011

# Agenda

| | |
|---|---|
| 1. | Introductions |
| 2. | History of the Project |
| 3. | Who is Shear? |
| 4. | Project Overview |
| 5. | Compliance Status |
| 6. | Summary of Application |
| 7. | Response to Submissions |
| 8. | What's Next: Timeline |
| 9. | Acknowledgements |

# Shear Diamonds Ltd.

**Julie Lassonde**
CEO, Executive
Chairman & Director

**Stephanie Autut**
VP Environment and
Community Affairs

**Chris Morton**
VP Operations

**Kyle Conway**
Site Environmental
Coordinator

# Shear Team Not With Us Today

Toronto Office

- Pamela Strand, President
- Martha Sabogal, Head of HR
- Richard Belfer, CFO
- Kelly Fearman, Investor Relations

Mine Site

- Joe Leil, Assistant Site Manager
- Jim Kane
- Christina Seitz, Site Administrator & Site HR

# Beneficiaries

- Andy Uyarrai – a native of Gjoa Haven, Andy has worked closely with the Jericho project for many years. Andy understands the many facets of Jericho's operations and has proven to be a valuable asset to Shear Diamonds
- Raymond Oniak – a native of Kugluktuk, Raymond has firmly established himself within the mining industry. With many years of experience, Raymond brings a vast array of knowledge and skill to the Site Services division of Shear diamonds
- Arthur Oniak – a native of Kugluktuk, Arthur's work ethic and aspiration to learn has made him invaluable to the Shear Site Services division. Arthur demonstrates a strong work ethic and offers an incredible skill set to the Shear team

# Continuity

- Chris Morton: VP Operations, was with Jericho when owned by Tahera. Intimate knowledge of the project
- Joe Leil: Assistant Site Manager, was with Jericho when owned by Tahera. Comprehensive knowledge of the project
- Stephanie Autut: VP Environment, ex-Executive Director of NIRB, reviewed the original application for Jericho done by Tahera. Comprehensive knowledge of the project

# Technical Team (EBA) Present

- Bill Horne - Senior Technical Reviewer
- Gary Koop - Engineering Team Lead
- Allison Rippin Armstrong - Environment Team Lead
- William Liu - Environmental Scientist

# Legal – Lawson Lundell

- JoAnn Jamieson
- Christine Kowbel

# Shear's Support Team

- EBA Engineering
- SRK Consulting
- Rescan
- Dyno-Nobel
- DRA Engineering
- McCarthy Tetrault
- Lawson Lundell
- QDC/Det'on Cho Logistics
- NUNA Logistics

# HISTORY OF THE PROJECT

# History

- The Project Certificate for the Jericho Diamond Mine was issued on July 20, 2004
- The Public Hearing for the original water licence was held December 6th and 7th, 2004.
- Date of the Type A Water Licence, NWB1JER0410, December 21, 2004, effective date January 25, 2005.
- The Jericho Diamond Mine was constructed in 2005 and 2006
- The mine went into commercial production on July 1, 2006

# History

- The mine operated for 24 months and produced 780,000 carats
- Tahera went into bankruptcy protection on January 10, 2008

# History

- Jericho temporarily shut down since June 2008
- AANDC assumed responsibility for the site
- Shear acquired Jericho - August 2010
- Water license due to expire on December 31, 2010
- Shear immediately began discussions with the NWB and AANDC to determine how best to proceed with the renewal of the water license
- Water licence renewal application filed on February 28, 2010

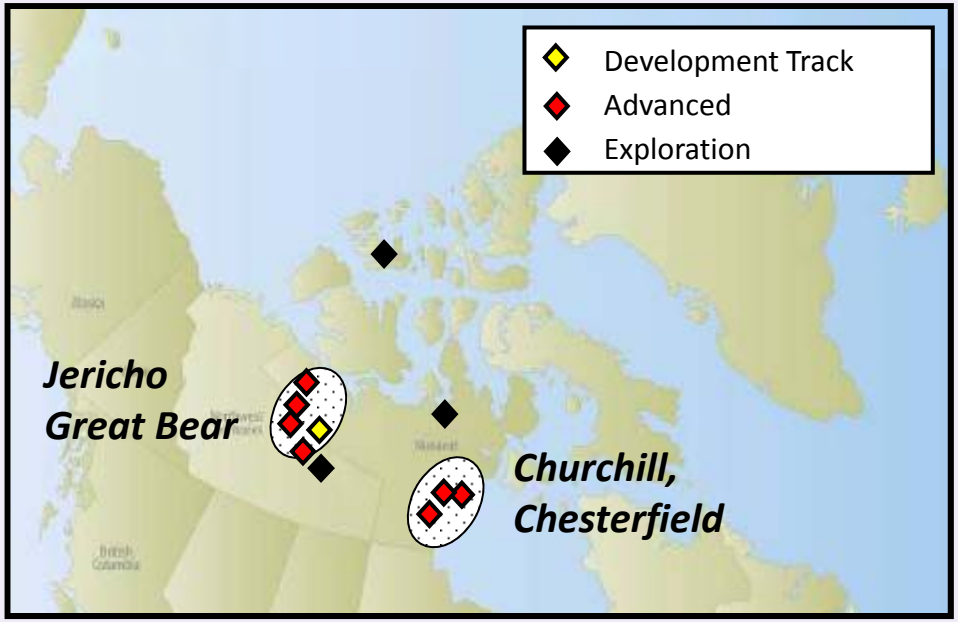
# History

- Technical Meeting and Pre-Hearing Conference
  - Held in Cambridge Bay June 20 and 21st, 2011
  - Technical submissions received from AANDC, EC and DFO
  - Shear provided a powerpoint presentation and written response to the submissions
  - Table of Commitments was developed

# WHO IS SHEAR?

# Shear is Nunavut Focused

- Mining friendly
- Nunavut is seeking sustainable future through mining
- Permitting process is well defined
- Strong partnerships in place: KIA, AANDC, GN and NRC (MOU signed Feb. 2011)
- Underexplored Geology




# Shear's Corporate Social Responsibility

Shear Diamonds is committed to being a leader in environmental sustainability while integrating environmental considerations into our business

Shear employees exemplify environmental stewardship through the application of sound judgement, best practices, meeting and exceeding regulatory requirements, and minimizing any adverse effects Shear's activities may have on the environment

# Environmental Track Record

- Thomas Kudloo Award – 2007
- Environment Stewardship Award - Kivalliq Inuit Assoc. 2007
- Community Award – NTI 2006

# JERICHO DIAMOND MINE

# Jericho History

| | |
|---|---|
| **1995** | Jericho discovered |
| **1998 - 2004** | Exploration and development |
| **2005 - 2006** | Construction of Jericho Mine<br>• Over C$350 million invested in infrastructure and exploration |
| **2006 - 2008** | Operated by Tahera Diamond Corporation (“Tahera”)<br>• 1.5 Mt mined, 1.2 Mt processes and 780,000 carats recovered |
| **2008** | Tahera granted bankruptcy court-protection and suspended operations |
| **2010** | Shear completed court-sanctioned transaction to acquire the Jericho Mine |

# Jericho Project
# Existing Infrastructure



- **C$200 Million in infrastructure**
  1. 2,000 tpd diamond processing plant
  2. Maintenance shop
  3. Fuel farm
  4. Staff Offices & Accommodations for 225
  5. Jericho open pit mine
  6. Year round airstrip
- **Excellent project access via air and winter road**
- **Operating permits in place**

# Jericho Diamond Value

## Large Diamonds Recovered



Jericho Diamonds (+10.8 ct)

**Over 1,000 stones greater than 10 cts**

**59 ct gem sold for $450,000**

**200 ct stone crushed by previous milling**

# Factors Contributing to Shut Down

| Tahera Issue | Shear Solution or Mitigating Measures |
|---|---|
| Foreign exchange movement | Original feasibility was based on a USD:CDN of $0.65 |
| Diamond prices | Future profitability is based on conservative diamond pricing (in light of today's markets) and forex |
| Diamond recovery | Analysis and re-engineering of diamond recovery plant |
| Geological controls | Shear commits to having a mine geologist on site during commercial production |
| Contractors | Shear run operation. Shear is experienced in effective contractor management |

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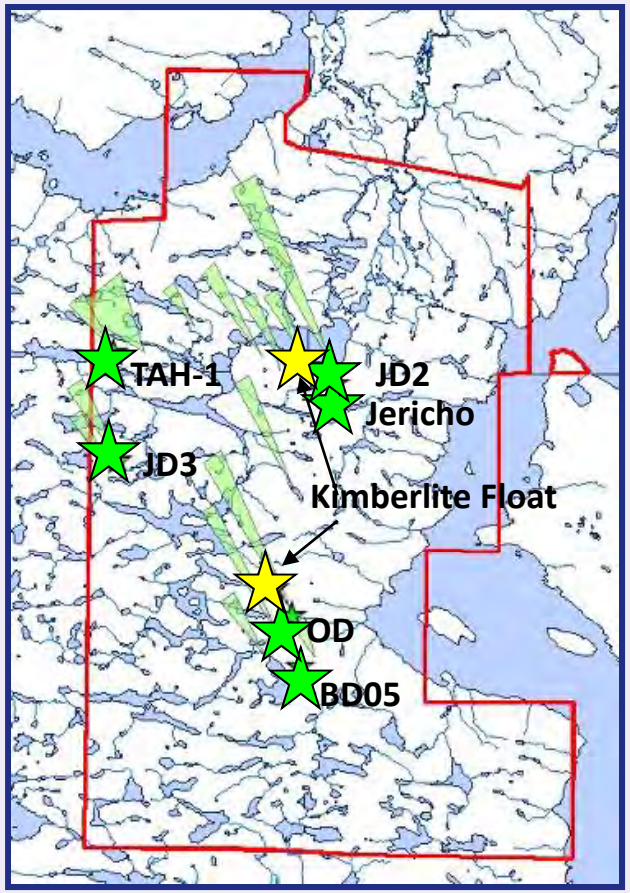
# OTHER KITIKMEOT ASSETS

# Excellent New Discovery Potential Jericho Project Carat Property

## Carat Property - Near Mine Exploration Potential

| Carat Property Highlights | |
|---|---|
| Shear's Ownership: | **100%** |
| Trucking Distance to Jericho: | **10 km** |
| Land Position: | **68,000 acres** |
| Known Kimberlites: | **6** |
| Kimberlite Indicator Dispersion Trails: | **5** |
| Unsourced Kimberlite Float: | **2** |

**JD3** – 493t RC bulk sample: 135 cts = 0.27 cpt
**JD2** – 219kg modelled microdiamond grade = 1.79 cpt



# Other Kitikmeot Assets

**Polar**

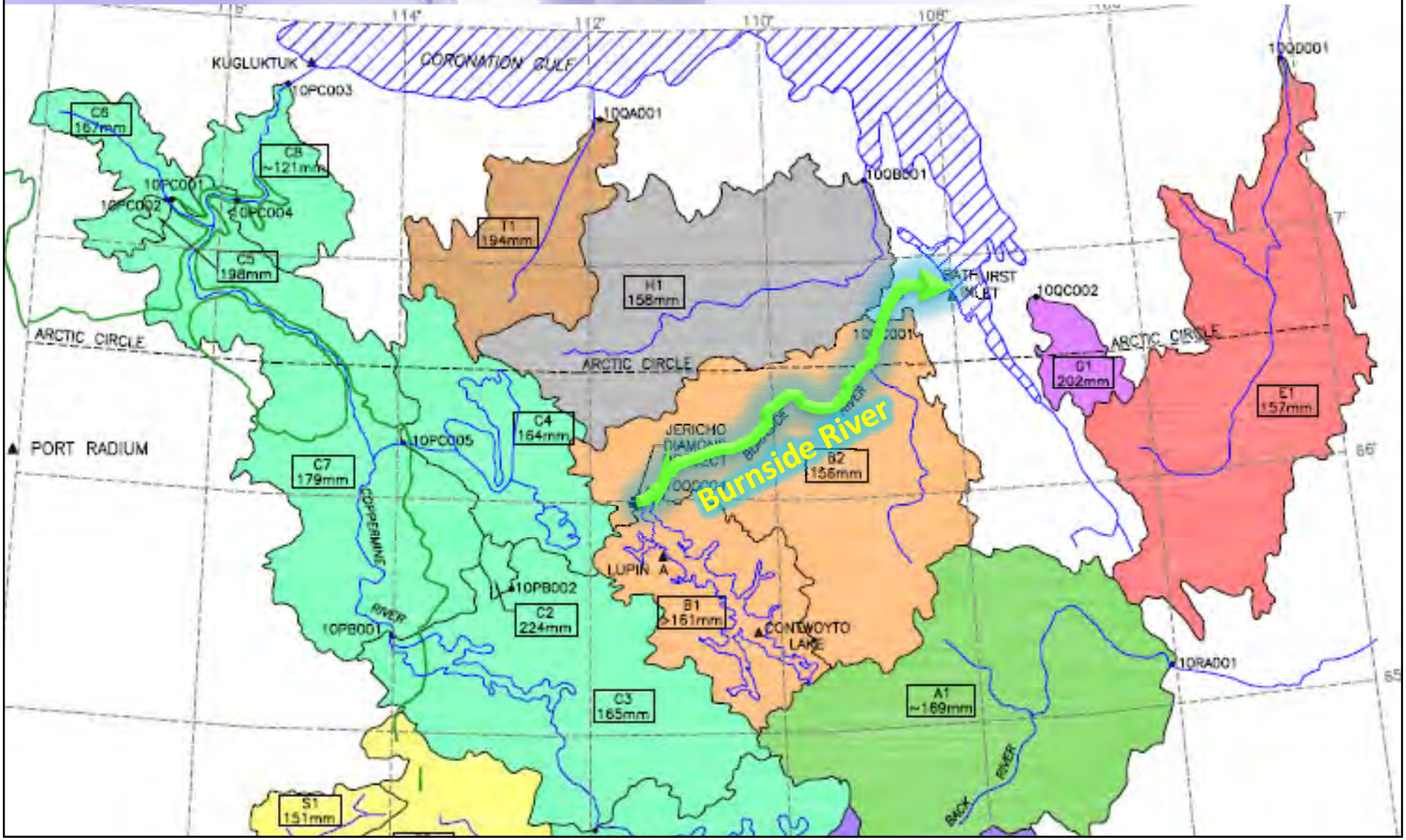
- 70,000 acres
- 4 known kimberlites

**Rockinghorse**

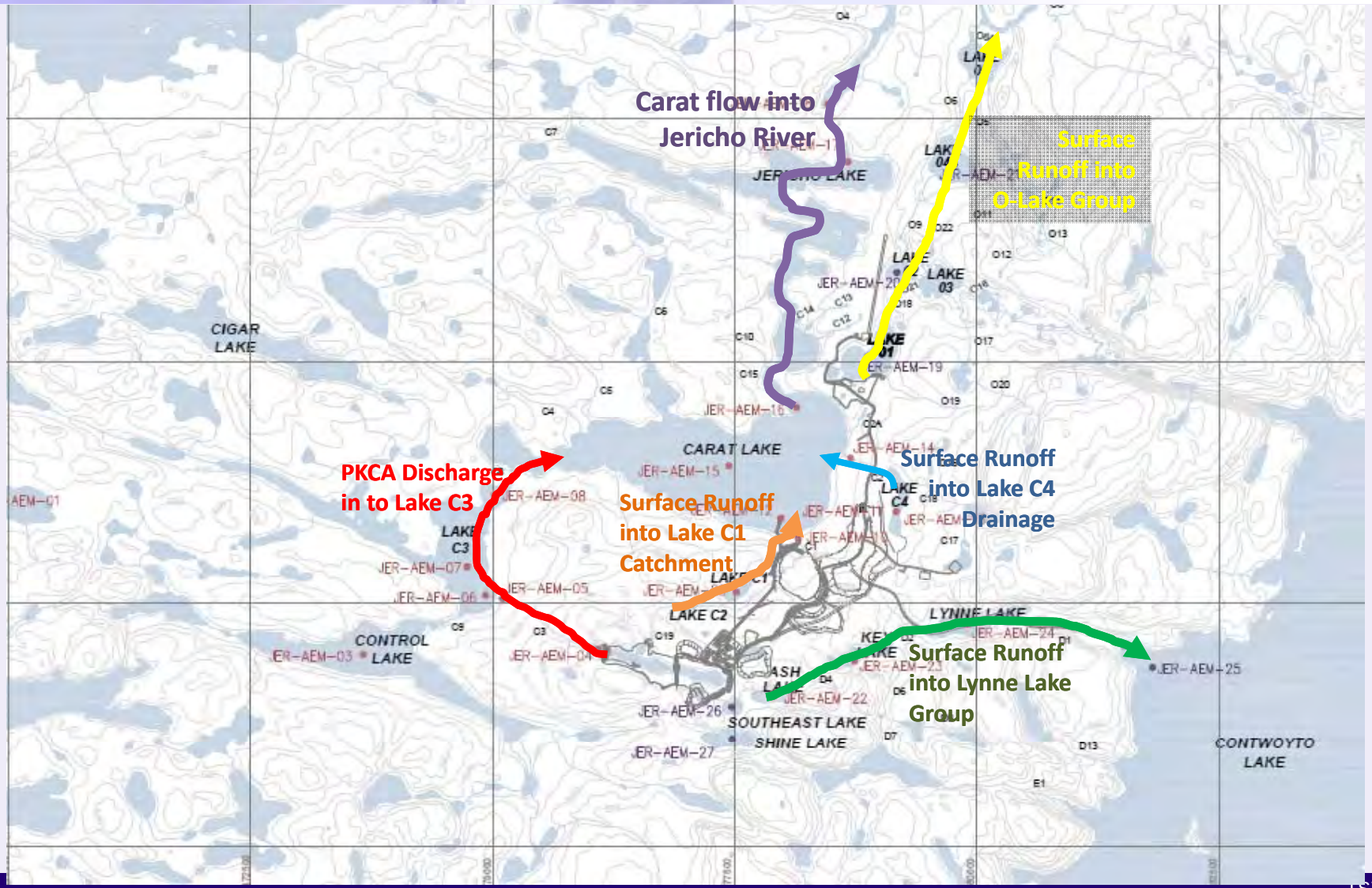
- 104,579 acres
- Anuri:
  - Rio Tinto JV
  - 15Mt kimberlite pipe
  - 26t bulk sample grading 0.35cpt

# PROJECT OVERVIEW

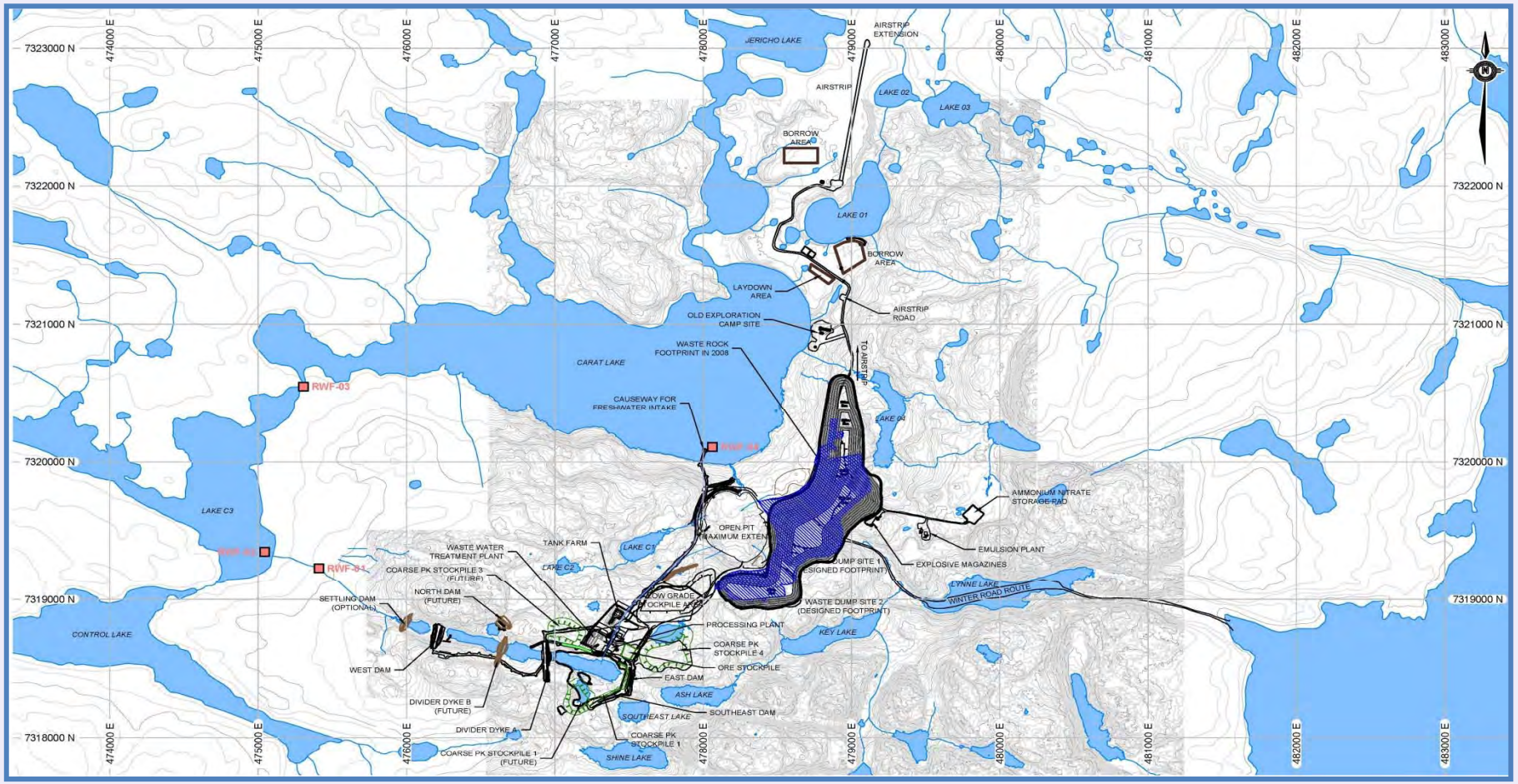
# Regional Water Flow Pathway



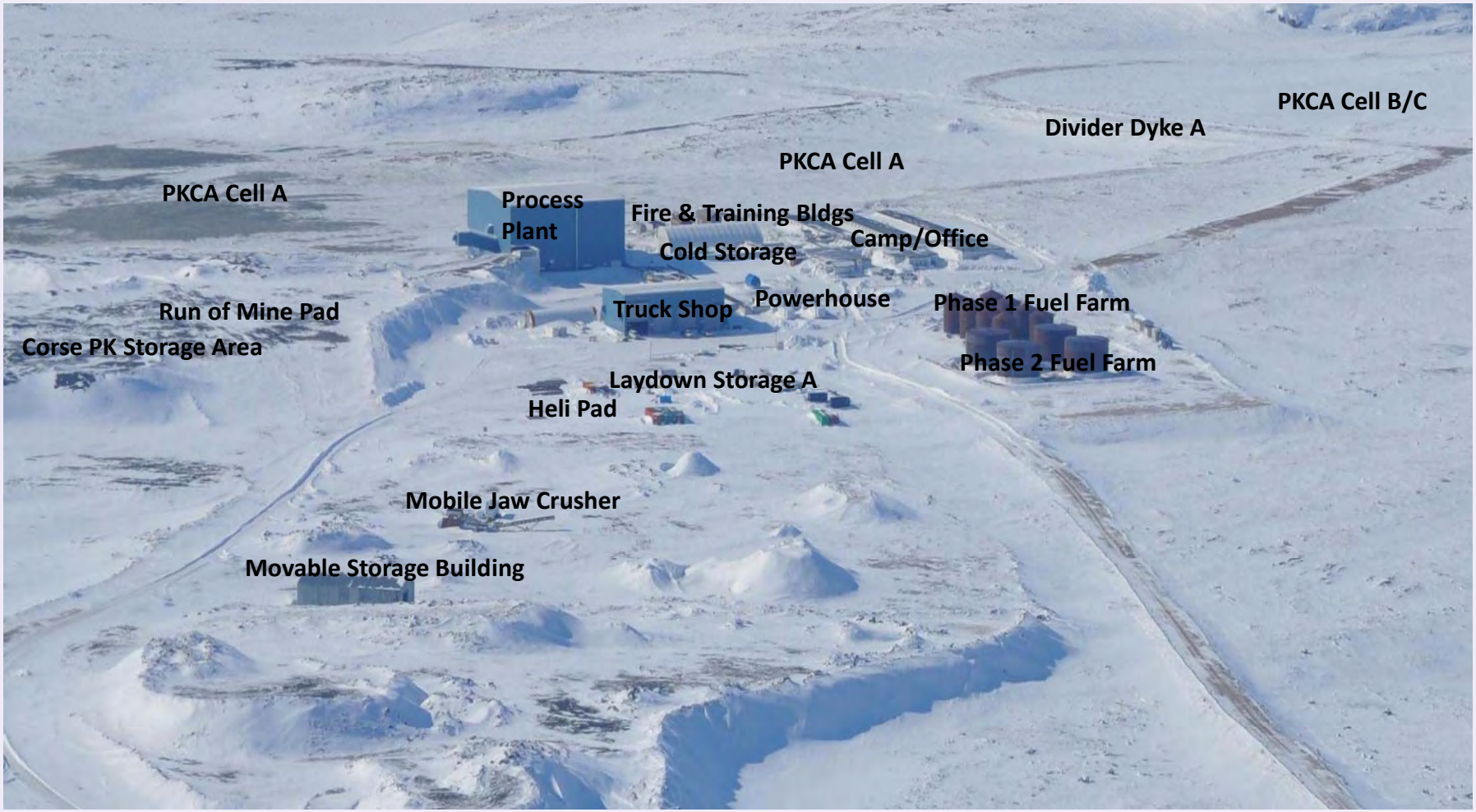
# Jericho Site Water Pathways



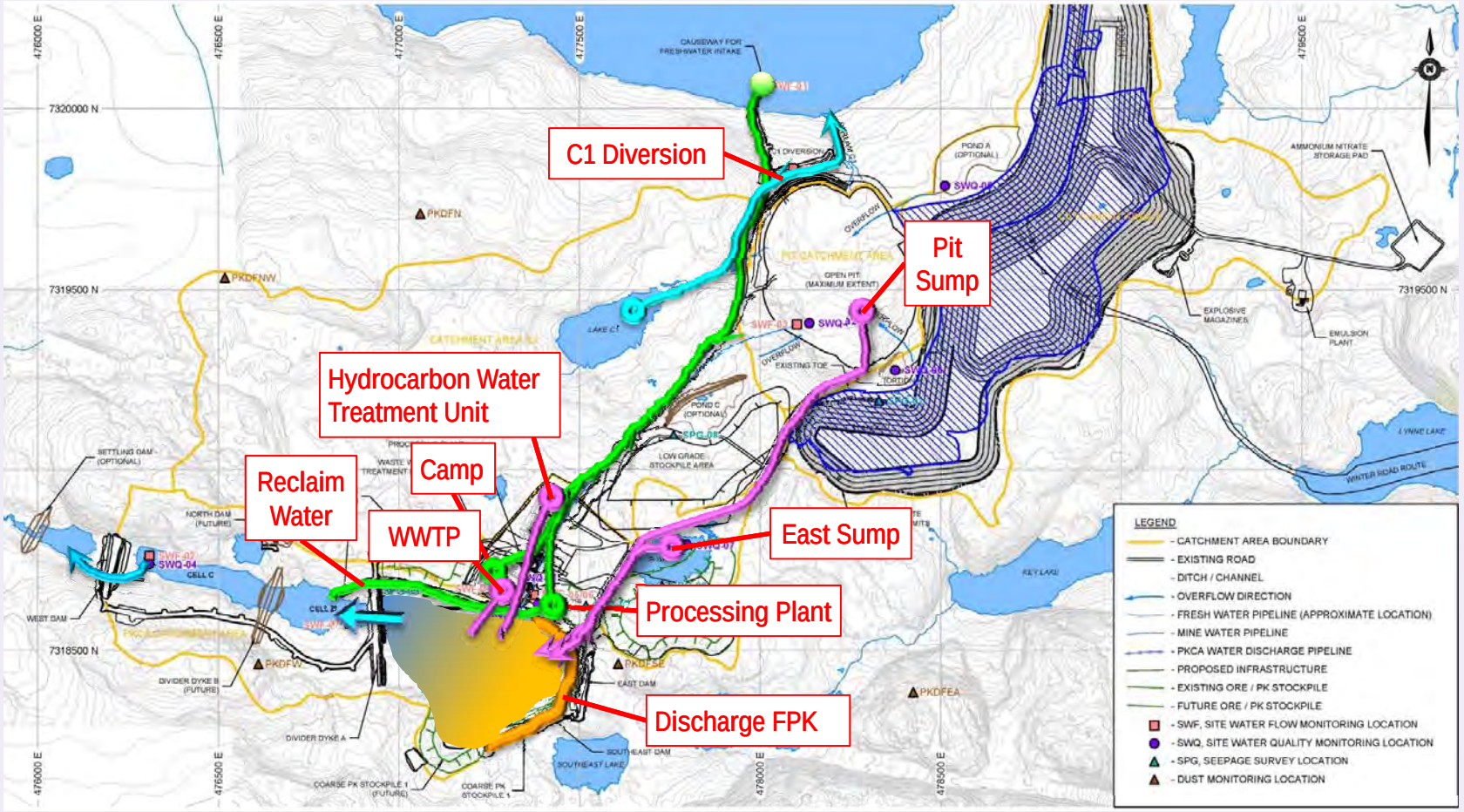
# Site Overview



# Site Layout


PKCA Cell B/C
Divider Dyke A
PKCA Cell A
PKCA Cell A
Process Plant
Fire & Training Bldgs
Camp/Office
Cold Storage
Powerhouse
Phase 1 Fuel Farm
Run of Mine Pad
Truck Shop
Corse PK Storage Area
Phase 2 Fuel Farm
Laydown Storage A
Heli Pad
Mobile Jaw Crusher
Movable Storage Building

# Site Overview – Site Water Flow

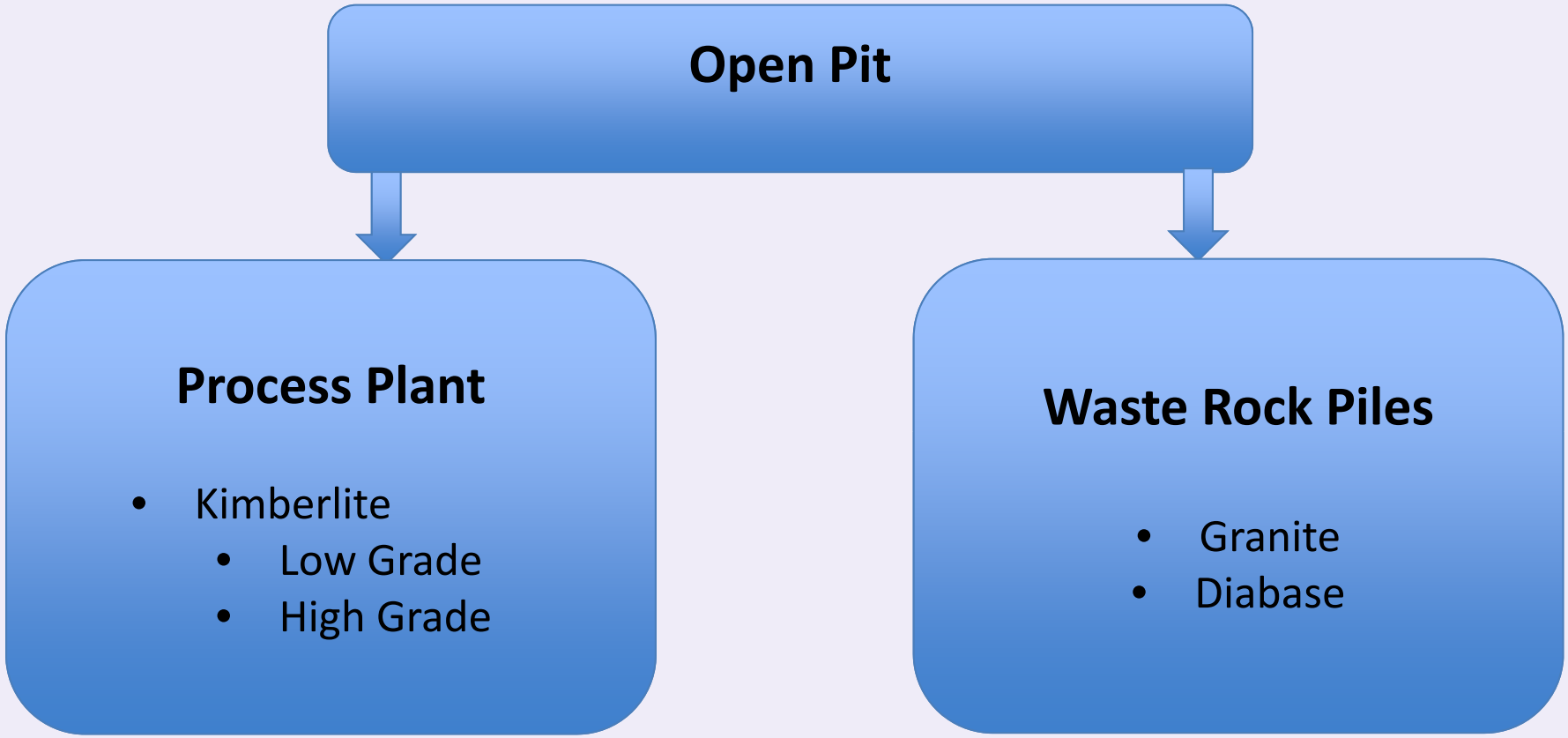


# Site Facilities

- Facilities at the Jericho Diamond Mine include:
  - Accommodations and Office Buildings
  - Wastewater Treatment System
  - Airstrip
  - Fuel Facilities
  - Open Pit
  - Waste Rock Piles
  - Process Plant
  - Process Kimberlite Containment Area (PKCA)
  - Coarse Processed Kimberlite Stockpiles
  - Landfill
  - Landfarm

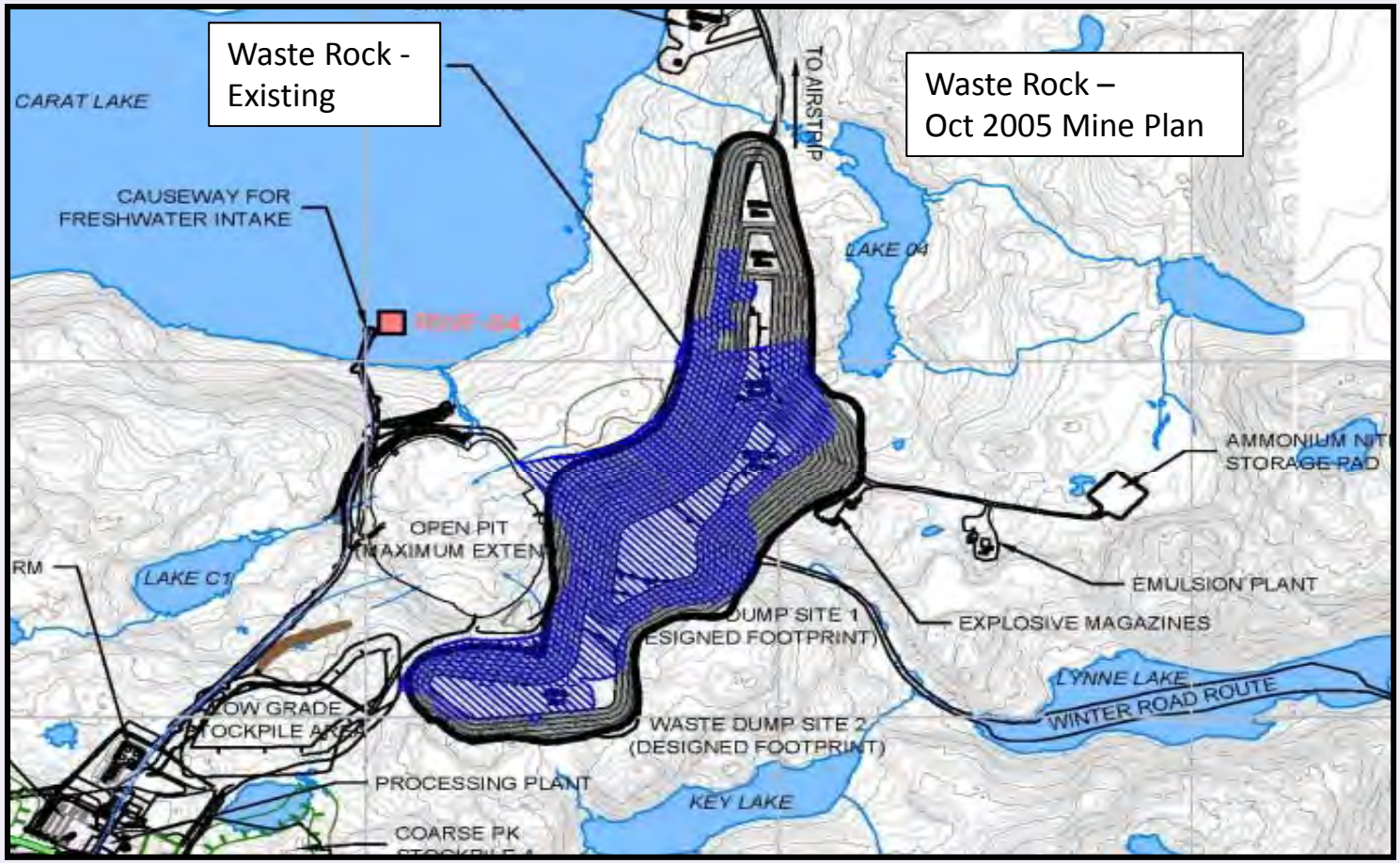
# Open Pit

# Mining


Open Pit
Process Plant
• Kimberlite
• Low Grade
• High Grade
Waste Rock Piles
• Granite
• Diabase

# Waste Rock Piles

# Waste Rock Piles



# Process Plant

# Processing the Diamonds

**Kimberlite Crushed**

## Coarse PK Stockpiles

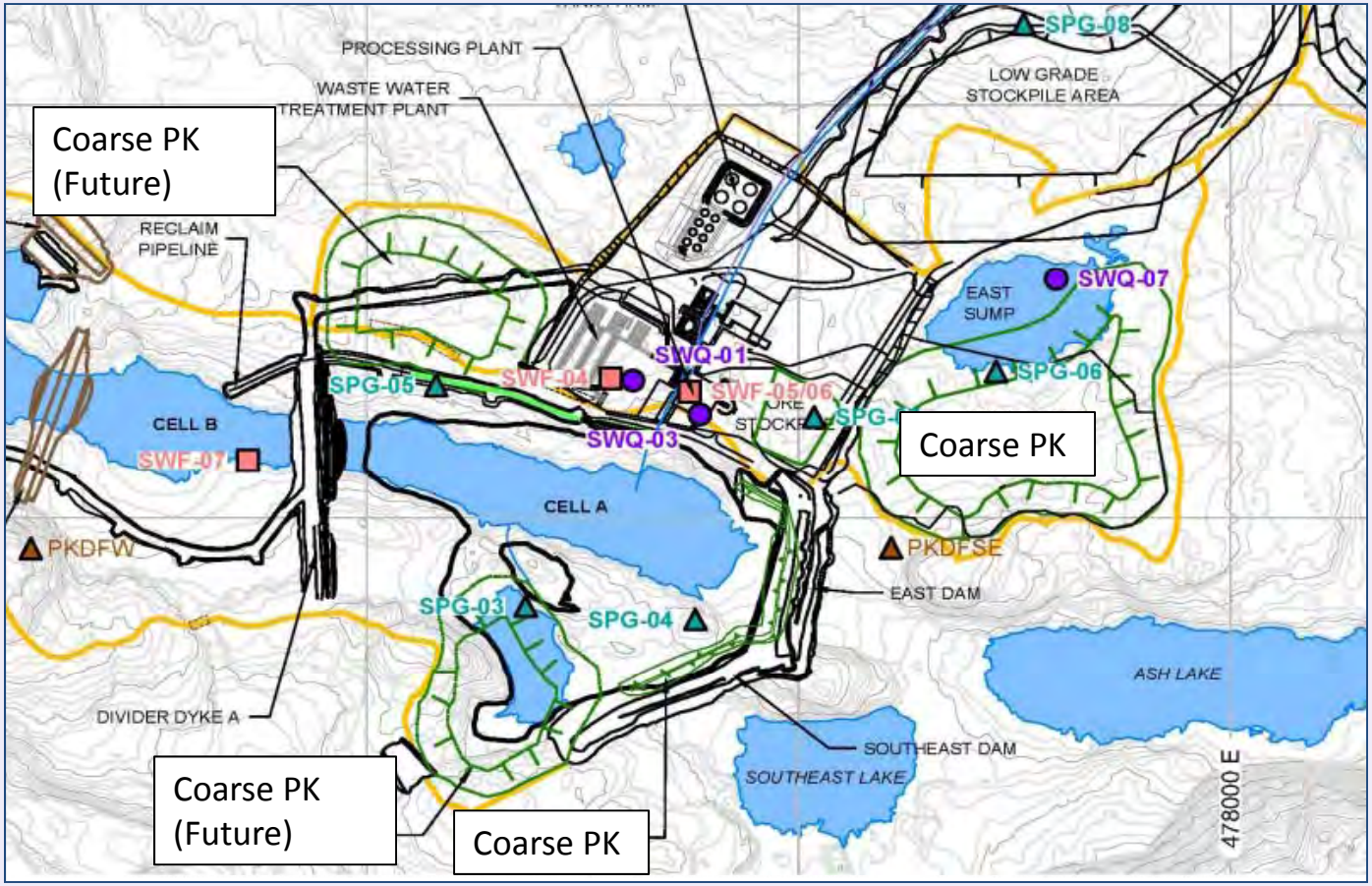
- Coarse PK - 81%
  - Gravelly Sand
- Recovery Rejects - 4%
  - Sand and Gravel

## PKCA

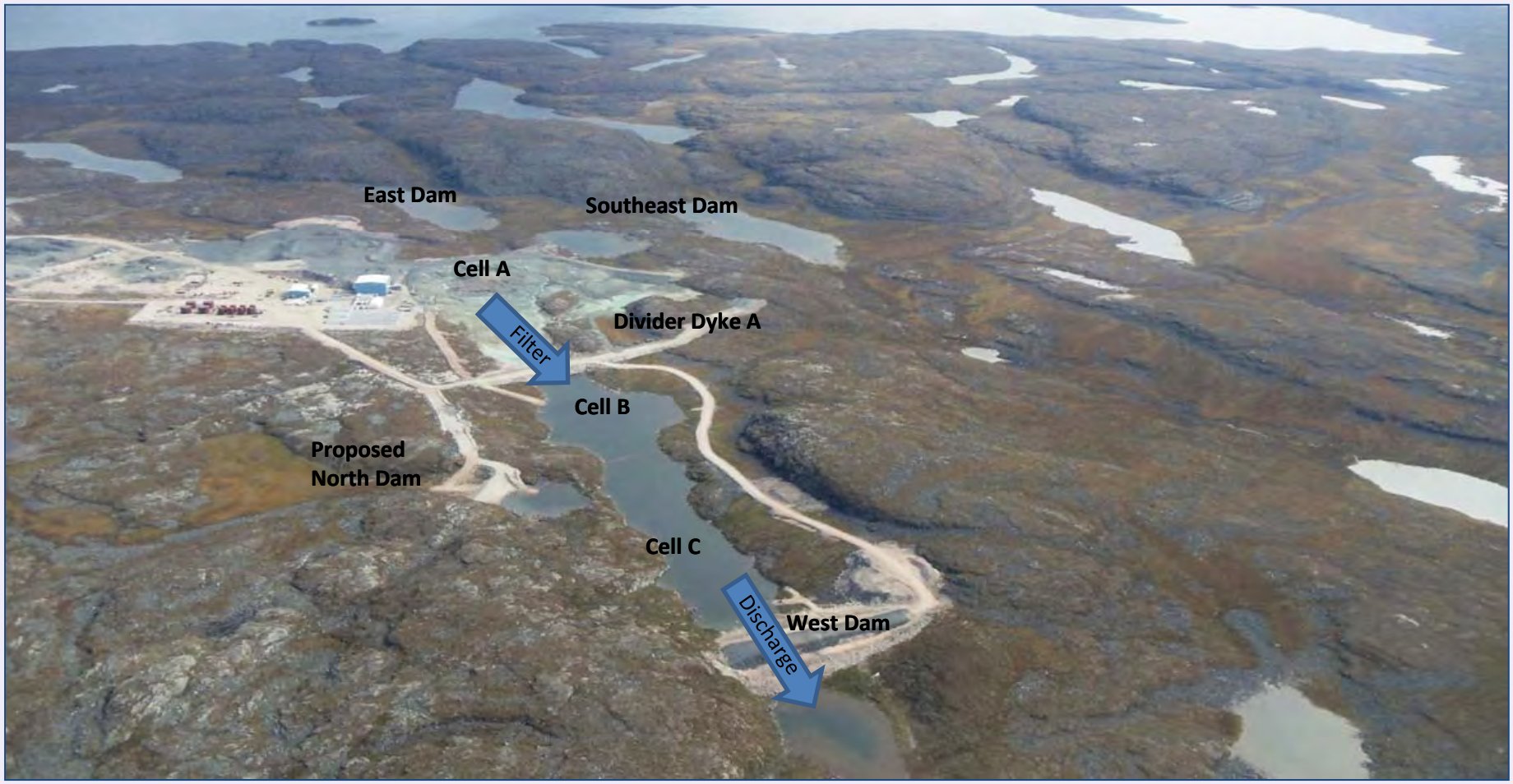
- Fine PK - 15%
  <0.1 mm
  70 – 85% Silt
  15 to 30% Clay sized
  Balance is sand

# Coarse Processed Kimberlite Stockpiles

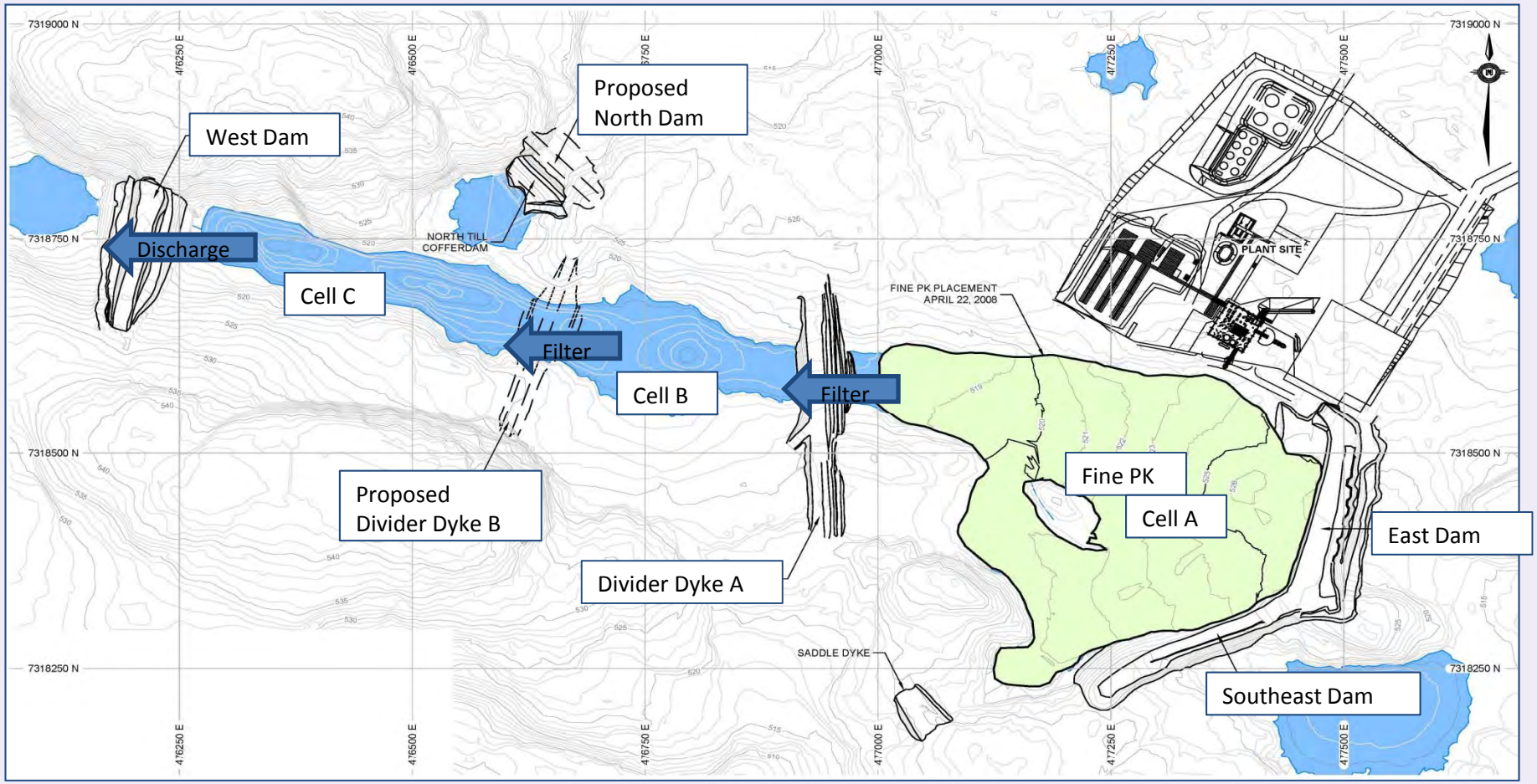
# Coarse Processed Kimberlite Stockpiles



# PKCA Facility



# PKCA Facility



# COMPLIANCE STATUS

# Compliance Status

Shear conducted a compliance review as part of the water licence renewal application. Deficiencies were noted in the following areas:

- Administrative
  - Submission of plans
- Construction
  - Facilities
- Waste Management
  - Waste storage, handling and disposal
- Monitoring
  - Submission of monitoring reports

# Compliance Status – Accomplishments to Date

Since acquisition Shear has worked toward bringing the site into full compliance. Some of the accomplishments to date include:

- Submitted a Care and Maintenance Plan
- Significant improvements to the AEMP
- Conducted AEMP sampling in April and August 2011
- Conducted site water sampling – GMP and SWMP
- Inventory of hazardous wastes on site
- Cleaned up old fuel and hazardous waste at Muskox Camp
- Purchased and tested a mobile water treatment unit (Oztek) for hydrocarbon contaminated water
- Pumped, treated and sampled the accumulated storm and melt water in the fuel containment facilities
- Developed procedures for onsite monitoring of TSS and nitrate

# Compliance Status – Accomplishments to Date

- Established an onsite lab
- Conducted a site wide clean-up
- Cleaned up stained soil – evidence of old spills
- Sub-arctic Surveyors – survey of site
- Updated the reclamation cost estimate for Crown and Inuit Owned Lands
- Developed and implemented an Air Quality Monitoring Program – worked with Environment Canada
- Contracted a 2010 and 2011 Geotechnical Inspection
- Conducted a Seepage Survey
- Filed a Fish Habitat Compensation Plan to DFO following numerous discussions
- Registered as a Hazardous Waste Generator

# Compliance Status – Inspections 2011

- Inspections of the Jericho Mine site were conducted by:
  - AANDC Water Resource Officer
    - (June 10, 2011 & Nov 1, 2011)
  - EC
    - (September 18, 2010 & September 19, 2011)
  - KIA
    - (August 24, 2011)

# AANDC Inspections 2011

| Action Items & Comments | Status |
|---|---|
| Plan required for how Shear will deal with old fuel on site. | Shear had fuel tanks dipped and the fuel tested. A plan is being developed for submission. |
| Treat and pump water in secondary containment facilities. | Shear assisted in the design of a mobile hydrocarbon water treatment system (Oztek). Water treated, sampled and pumped to the PKCA. |
| Clean up numerous legacy (minor) spills. | Minor spills and “stains” around site were cleaned up. |
| Plan for the Hazardous Waste Transfer Area. | Shear will address the HWTA in 2012. |
| All fuel to be stored in secondary containment, including drummed fuel. | Secondary containment was already en route when the Inspector was on site. All fuel on site is in secondary containment. |

# Environment Canada Inspections 2011

| Action Items & Comments | Status |
|---|---|
| EC requested electronic copies of all our plans, but specifically: Sample Monitoring Plan, Containment Pond Inspection Reports, Spill Contingency Plan | All electronic plans have been sent to EC |
| EC – Requested amounts of all E2 gases on site | All E2 gases on site have been measured and reported to EC |
| EC noted that we had to register Shear's E2 gases on site (CEPA registration) | Confirmation of registration Nov 15, 2011 |
| Removal of water in the fuel farm berms | Fuel Berms pumped out Sept 23, 2011 |

# SUMMARY OF APPLICATION

# Licence Terms and Conditions

- Renew the existing water licence, on substantially the same terms, for the life of the mine (14 years)

- Requesting amendments concerning:
  - Term of the licence
  - Timing of submission of Final Closure and Reclamation Plan
  - Flexibility of filing timelines
  - Remove Part G, Item 2 (e)
  - Remove terms and conditions that no longer apply and update other conditions

- Updating Security

# Term of Licence

- The licence application proposed a term of 10 years
- This was based on a production rate of 2000 tpd. At this production rate the projected mine life was 8 years which included 2 years of reclamation
- A review of the processing operations revealed that the rate of processing will be closer to 1250 tpd.
- This results in a projected mine life of 10 years, plus 2 years for reclamation
- It is anticipated that it will take 2 years to resume production
- **Based on these new projections, Shear is requesting that the term of the licence be 14 years**

# Security

- Shear and the KIA have reached agreement that the total amount of security for IOL's is $2,892,000

# RESPONSE TO SUBMISSIONS

# Responding to Submissions

- Shear appreciates the time and effort that reviewers have invested in reviewing our application and submissions
- In responding to the technical submissions received to date:
  - Shear has provided a written response to **every** query, comment and recommendation received. The written response has been provided in table format
  - Shear has also made a number of commitments which have been provided in the same table

# Responding to KIA

In response to the Kitikmeot Inuit Association's submission:

- Closure and Reclamation Security
  - Shear and the Kitikmeot Inuit Association have reached an agreement related to reclamation security
- Water Compensation
  - Shear and the Kitikmeot Inuit Association have no outstanding issues related to water compensation

# Responding to KIA cont.

- Final Closure and Reclamation Plan
  - The Kitikmeot Inuit Association would like the Final Closure and Reclamation Plan filed within 2 years of the issuance of the licence
  - Shear proposes submitting the Final Closure and Reclamation Plan within 3 years of the issuance of the licence in order that Shear can undertake the studies required under Schedule M, Item 2 of the licence

- Term of the Water Licence
  - The Kitikmeot Inuit Association is requesting a 5 year term of licence
  - Shear is requesting a 14 year term of licence which will include 2 years leading up to production, 10 years of production and 2 years for reclamation and closure

# Responding to DFO

- In response to Fisheries and Oceans Canada's (DFO) submission, Shear will:
  - Continue to work with DFO to develop plans and timelines to achieve the completion of the outstanding fish habitat compensation and monitoring
  - Provide copies of all future plans and reports to DFO for review as they are available

# Responding to AANDC

- In response to Appendix 1, Shear has submitted a detailed table of responses and commitments
  - Shear will speak to a number of issues in detail
- In response to Appendix 2, Shear submits that the timelines proposed by Shear in Technical Memo I, as requested by the NWB, and the current licence terms should continue to apply
- In response to Appendix 3, Shear and AANDC have reached agreement

# Responding to EC

- In response to Environment Canada's submission, Shear has submitted a detailed table of responses and commitments
- Shear will speak to a number of these issues in detail

# Responses to Particular Issues

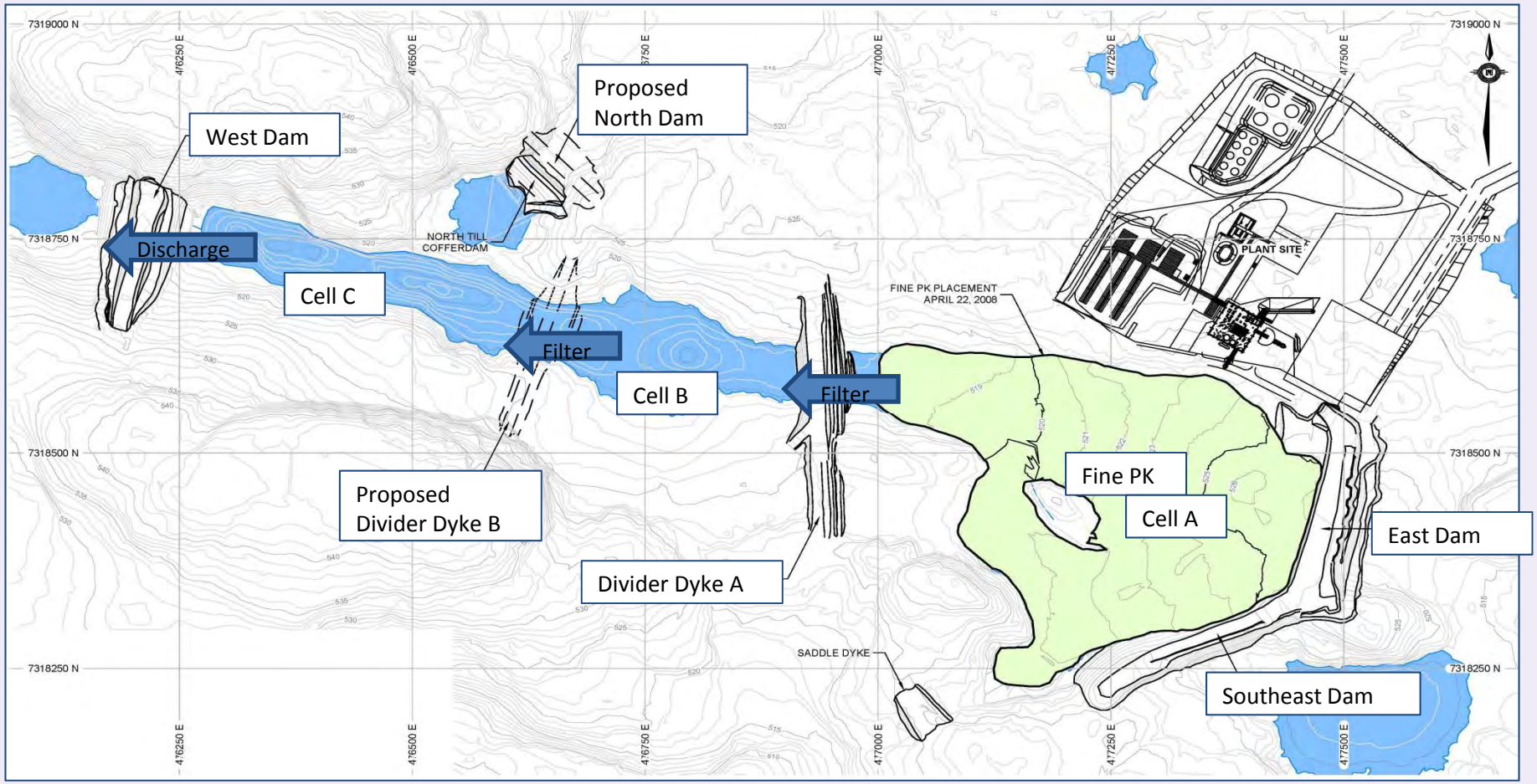
In reviewing the Intervener AANDC and EC submissions Shear identified some particular issues to address in more detail:

- Further work required for the PKCA
- Residual flocculent & coagulant and chronic toxicity
- The Dilution Factor
- Effluent Quality Criteria recommended by EC
- Site Water Quality
- Open Pit Infill Rates

The next section of this presentation will address these issues

# PKCA

# PKCA Facility – Dams and Dykes



# PKCA - Capacity

| Capacity | |
|---|---|
| Cell A | 1,140,000 $m^3$ |
| Cell B | 250,000 $m^3$ |
| Total | 1,390,000 $m^3$ |

| Fine PK | |
|---|---|
| Historical 2008 | <579,000 $m^3$ |
| Future | 806,000 $m^3$ |
| Total | 1,385,000 $m^3$ |

- There is enough capacity in the PKCA for the life of the mine

# Flocculent

# Residual Flocculent and Coagulant

- Concern has been raised with regard to residual flocculent and coagulant in the PKCA and discharge water
- Flocculent is added to the process water in the process plant.  The name flocculent comes from the wooly appearance of the floc
- Flocculent clumps suspended solids together making them heavy so that they settle out in the PKCA

# Flocculent

# Flocculent and Coagulant

- Shear has committed to working with the lab toward gaining a better understanding of the products that will be used at Jericho
- Shear will provide the results of all studies to the regulatory authorities
- Shear will conduct a sampling program that ensures that the amount of residual flocculent is minimal and does not have a harmful effect in the receiving environment

# Dilution Factor

# Verification of Dilution Factor

- Environment Canada recommended:
  - A plume delineation study be done late in the discharge season, which examines the extent and behaviour of the plume in three dimensions. Water quality objectives should be stated, and comparisons drawn for where they are expected to be met in Lake C3 (based on tracer concentrations)
- Shear's response:
  - Shear has started and will continue to monitor the water quality in the Lake C3 mixing zone;
  - Shear will directly verify the dilution factor in the Lake C3 mixing zone once mining operations resume;
  - Shear will also undertake a plume delineation study within two years following commencement of mining operations

# Effluent Quality Criteria

# Effluent Quality Criteria

- Shear proposed no changes to the current effluent criteria limits in the submissions to the Nunavut Water Board
- Environment Canada has recommended:
  - Reductions in the effluent discharge limits for nitrate and nitrite
  - The addition of discharge limits for Total Extractable Hydrocarbons (TEH)
  - The removal of discharge limits for TDS and chloride, instead, monitoring these parameters within 24 months of resuming mining operation
  - The removal of discharge limit for oil and grease if not depositing of untreated camp waste directly into the PKCA

| Parameter | Unit | 2004 Water Licence Limits | | Recommended Limits By Environment Canada | |
|---|---|---|---|---|---|
| | | Max. Grab | Max. Average | Max. Grab | Max. Average |
| pH | - | 6 - 8.8 | 6 - 8.8 | 6 – 8.8 | 6 – 8.8 |
| Total Dissolved Solids (TDS) | mg/L | 4,000 | 2,000 | Monitoring | Monitoring |
| Total Suspended Solids (TSS) | mg/L | 25 | 15 | 25 | 15 |
| Chloride (Cl) | mg/L | 1,000 | 500 | Monitoring | Monitoring |
| Ammonia (N) | mg/L | 12 | 6 | 12 | 6 |
| Nitrate (N) | mg/L | 56 | 28 | 40 | 20 |
| Nitrite (N) | mg/L | 5 | 2.5 | 2 | 1 |
| Phosphorus (P) | mg/L | 0.4 | 0.2 | 0.4 | 0.2 |
| Aluminum (Al) | mg/L | Total – 3.0<br>Diss. – 2.0 | Total – 1.5<br>Diss. – 1.0 | Total – 3.0<br>Diss. – 2.0 | Total – 1.5<br>Diss. – 1.0 |
| Arsenic (As) | mg/L | 0.10 | 0.05 | 0.10 | 0.05 |
| Cadmium (Cd) | mg/L | 0.0024 | 0.0012 | 0.0024 | 0.0012 |
| Chromium (Cr) | mg/L | 0.17 | 0.087 | 0.17 | 0.087 |
| Copper (Cu) | mg/L | 0.04 | 0.02 | 0.04 | 0.02 |
| Lead (Pb) | mg/L | 0.02 | 0.01 | 0.02 | 0.01 |
| Molybdenum (Mo) | mg/L | 1.5 | 0.73 | 1.5 | 0.73 |
| Nickel (Ni) | mg/L | 0.10 | 0.05 | 0.10 | 0.05 |
| Uranium (U) | mg/L | 1.0 | 0.5 | 1.0 | 0.5 |
| Zinc (Zn) | mg/L | 0.50 | 0.25 | 0.50 | 0.25 |
| Oil and Grease | mg/L | 5.0 | 3.0 | Removed | Removed |
| Total Extractable Hydrocarbons (TEH) | mg/L | - | - | - | 3 |
| $BOD_5$ | mg/L | 25 | 15 | 25 | 15 |
| Faecal Coliforms | CFU/dL | 20 | 10 | 20 | 10 |

# Effluent Quality Criteria

- Shear's Response:
  - Shear accepts the reduction of nitrite
  - Shear accepts the addition of Total Extractable Hydrocarbons (TEH)
  - Shear accepts the removal of the discharge limit for oil and grease
  - Shear proposes maintaining TDS and chloride as licence criteria, as opposed to just monitoring them
  - Shear proposes no change to the current nitrate limit and that the company hold a Technical Meeting following two year of operations to review the water quality data

# Site Water

# Site Water Quality & Management

- A number of comments were received with regard to site water quality and management
- In 2011, Shear gained a better understanding of site water
- Shear will revise and submit the Site Water Management Plan by end of year 2012
- Shear will incorporate the recommendations from intervenors and the knowledge that Shear has gained through monitoring and sampling in 2011

# Site Water Quality – Pit Water

- AANDC:
  - Shear to reassess (Pit) Water Quality Dilution modeling after production
- Environment Canada recommends:
  - EC requests the Proponent commit to a timeline for delivering its pit water quality remodeling
- Shear's Response:
  - Shear will be able to understand pit water quality after resumption of mining operations. Shear proposes sampling and monitoring pit water quality for a period of two years at which time the company will update the pit water quality model. Shear is requesting two years because the first year of mining will not be representative of a typical operations year

# Site Water Quality – Collection Ponds

- AANDC:
  - Design of berms (retention ponds) – conceptual design of ponds will be included in revised SWMP (not in advance of hearings)
- Shear's response:
  - Shear conducted a Seepage Survey in September of 2011. Copies of the report are being provided. Based on the results of the seepage survey Shear will implement a more detailed seepage survey program in 2012 that includes seasonal sampling and establishing sampling stations in Carat Lake and Lake C1. Shear will conduct a surface water dispersion model in Carat Lake
  - The detailed survey program will include source and fate investigations
  - The results of the detailed seepage survey program will assist Shear in determining the need for and the design requirement for any collection system

# Pit Water Quality and the PKCA

AANDC:

- Shear to reassess Water Quality Dilution modeling after production

Shear's Response:

- Reassess water quality mixing modeling after production resumes
  - TDC water quality during production – nitrate concentration was upto 121 mg/L in August 2007
  - Anecdotal information indicates that blasting practices did not adhere to the management plan
- Shear will include the site water quality prediction for production in the updated Site Water Management Plan

# Open Pit Infill Rates

- AANDC recommends:
  - Shear include contingency measures in updated A & R to facilitate filling of the pit if it is not found to be filling to schedule

- Shear's response:
  - Shear will include contingency measures that will facilitate pit filling in the Final Closure and Reclamation Plan.
  - A revised ICRP will be filed within one year of the date of reissuance of the water licence

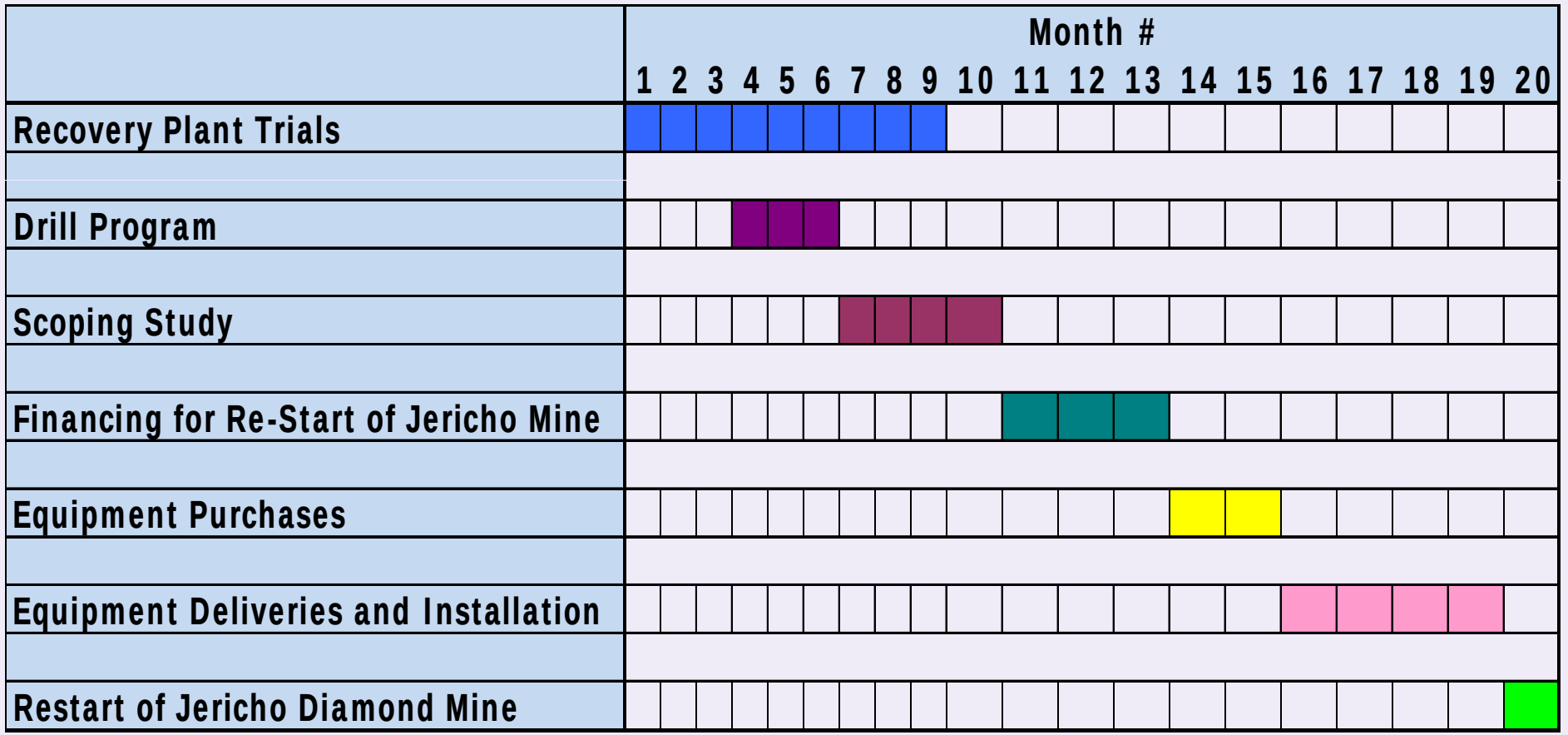
# Open Pit Infill Rates

- Environment Canada recommends:
  - Shear's commitment to re-evaluate the pit fill rate by April 2012 and looks forward to reviewing the revised Plan and pit fill rate when available

- Shear's response:
  - Shear is re-evaluating the pit infill rates and will provide a Technical Memo in April 2012 as committed. The Technical Memo will present scenarios and options for infilling. This information will also be included in the revised ICRP and Final Closure and Reclamation Plan

# WHAT'S NEXT: TIMELINE

# What's Next? – Timeline



# ACKNOWLEDGEMENTS