



# HiTEST SILICON



***Proposed Newport, Washington Silicon Metal Facility***





- Mississippi Silicon

## II. Project Overview

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- Silicon Metal Plant  
Bosnia



# Project Overview

## Conversion of Quartz to Silicon Metal

- Silicon is one the most useful elements, with an environmentally friendly manufacturing process and use in many critical applications
  - Standard manufacturing requires six tonnes of raw materials to produce one tonne of silicon metal

### Raw Materials

**High Purity, Hard Rock Quartz**  
(2.5 tonnes per tonne of Si metal)



**Metallurgical Coal or Charcoal**  
(0.8 tonnes per tonne of Si metal)



**Woodchips**  
(2.0 tonnes per tonne of Si metal)



### Manufacturing Process

Materials are heated to temperatures in excess of 3,000 F in a submerged arc furnace



**Chemical Reaction:**



### Finished Product





# Project Overview

## *Silicon Metal Plant Project*

- 60,000 tonne per year silicon metal production capacity
- Direct employment: 150+ workers
  - Additional indirect employment: 750+ workers
- Two year construction period, requiring an estimated 250 - 400 construction workers
- Production process does not require or produce any heavy metals or hazardous chemicals as by-products
  - All materials required during production process and consumed leave the plant as a saleable product
  - Closed loop system for water, that only consumes 8,000 gallons of water per day, plus sanitary water for workers
  - Water fogging/misting system for dust containment at all drop and discharge points
  - Coal and charcoal material stored in covered area
  - Water sprays utilized to keep wood chips saturated
  - Due to the extremely high quality of the quartz resource and state-of-the-art plant, HiTest will have the unmatched capability to produce all grades of silicon metal to unique specifications
  - Plant lifespan 50+ years

### Example Silicon Metal Plant









*HiTest is building the most modern and efficient silicon metal plant to serve the North American market*





# Project Overview

## Silicon Metal End Markets

End Market	Description	Representative Consumers
<b>Aluminum Products</b>	<ul style="list-style-type: none"> <li>Globally, 44% of silicon metal produced in 2016 was used as a strengthener and alloying agent in the production of aluminum</li> <li>Addition of silicon metal in the aluminum production process improves castability and minimizes shrinkage and cracking</li> <li>Aluminum is often used as an alternative to steel and other metals in the manufacture of automotive parts to achieve more fuel efficient auto, rail and marine vehicles</li> </ul>	 
<b>Silicones</b>	<ul style="list-style-type: none"> <li>The production of silicones, utilized extensively in the chemicals sector, accounted for approximately 33% of global silicon metal demand in 2016</li> <li>Silicones are man-made polymers that are widely applicable based on their unique characteristics, including stability under high temperatures and resistance to sunlight, moisture and cold</li> <li>By altering their chemical structure, silicones can be synthesized into a wide range of compositions, varying in consistency from liquids and gels to rubber and hard plastic-like materials</li> </ul>	 
<b>Polysilicon (Solar &amp; Computer Chips)</b>	<ul style="list-style-type: none"> <li>Silicon metal is the primary input into the production of polycrystalline silicon, common referred to as polysilicon, as well as into the production of solar grade silicon</li> <li>Polysilicon is produced by using complex chemical reactions to purify silicon metal to very high levels (99.9999% pure or higher)</li> <li>Polysilicon is an essential material in the production of both semi-conductors (for integrated circuits) for the electronics industry and photovoltaic cells for the manufacture of solar panels</li> </ul>	 

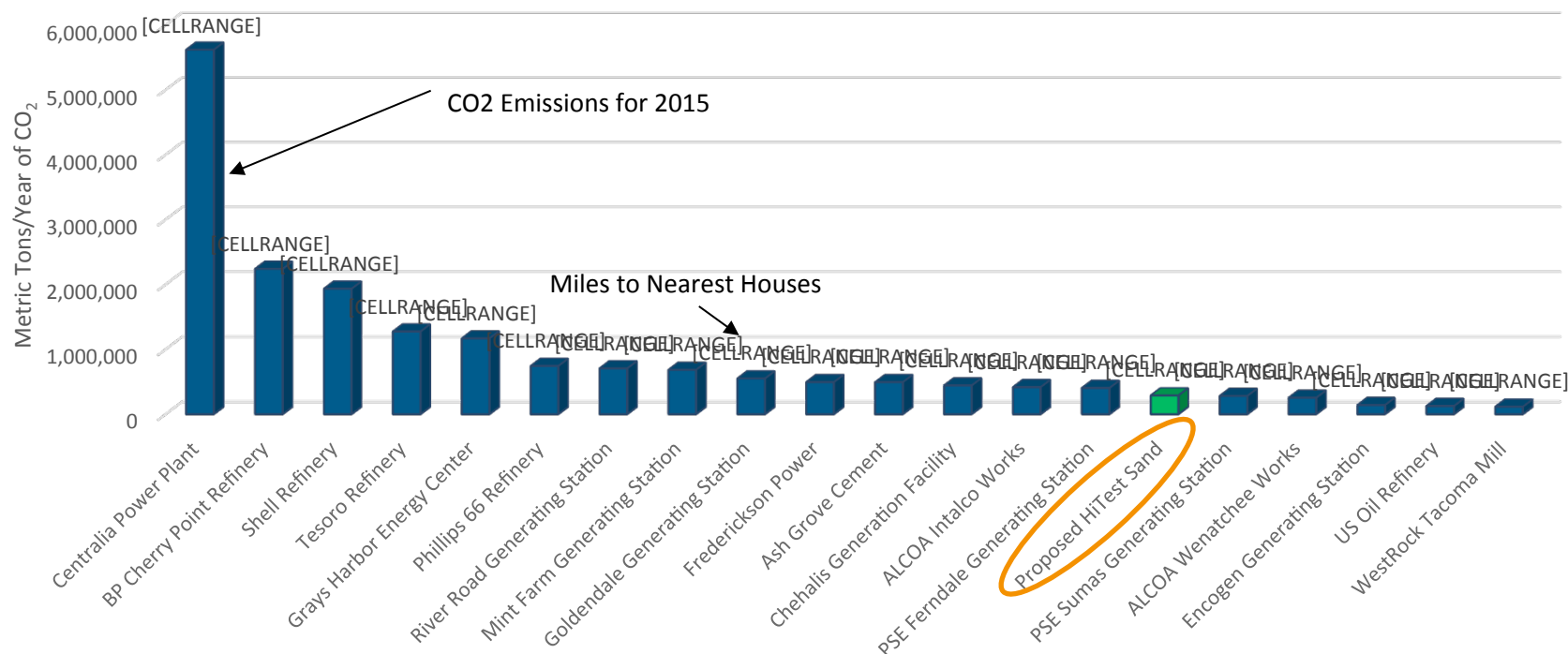


# Project Overview

## Silicon Metal Plant Project Environmental Footprint CO2 Emissions

### Washington State Direct CO<sub>2</sub> Emissions

2015 Values from [www.epa.gov/ghgreporting](http://www.epa.gov/ghgreporting)



*HiTest is building the most modern and efficient silicon metal plant to serve the North American market*



# Project Overview

## Comparative Life-Cycle CO<sub>2</sub> Emission

- 50% of HiTest silicon metal production will be sold into the solar panel end-market (polysilicon)
- Carbon positive impact
  - **For every tonne of CO<sub>2</sub> created during the production of silicon metal, nine times that amount is saved from being emitted to the atmosphere over the life of the solar panels**

Energy Source	gCO <sub>2eq</sub> / kWh
Coal	820
Natural Gas	490
Biomass	230
PV Solar	41
Geothermal	38

*Strong renewable trends will continue to drive demand for silicon metal*



# Project Overview

## *Silicon Metal Plant Project Water Consumption*

- Closed loop system for water, that only consumes 8,000 gallons per day, plus sanitary water for workers
  - 6,000 Wood chip saturation and dust suppression –
  - 2,000 Furnace evaporation
- The average household in Newport uses 333 gallons per day of water
- Equivalent to adding 24 new residences to the county
- No water is withdrawn from the river or put back into the river
- No tailing ponds or contaminated water
- No chemicals or heavy metals required
- Water can be either well water or city water



*HiTest is building the most water efficient plant on the planet*





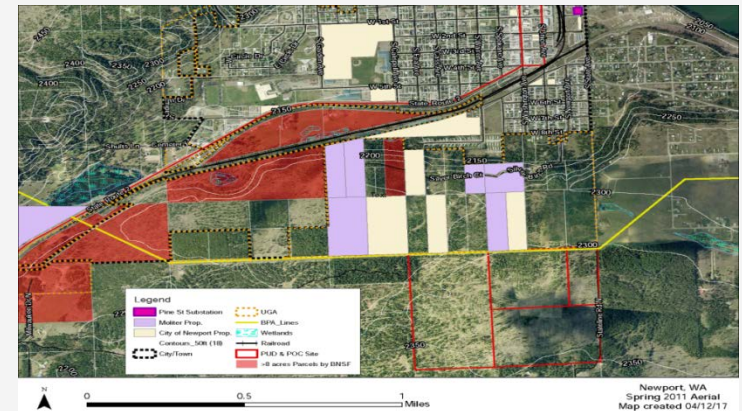
# Project Overview

## Plant Site – Newport, Washington

- HiTest closed on its land purchase agreement for the Newport silicon metal plant site in mid-September
  - Land purchased from Pend Oreille Public Utility District
- The plant site encompasses 192 acres and has several attractive features:
  - Proximate to available labor pools in:
    - Newport, WA
    - Spokane County, WA
    - Stevens County, WA
    - Bonner County, ID
  - Easy highway and rail access
  - Strong city, county and state support throughout the process
    - ▶ Received Project of Statewide Significance designation
    - ▶ Tax incentives granted via state legislation
  - Close proximity to Box Canyon and Boundary Dams(138MW) provide cheapest and cleanest hydroelectricity in the U.S.
    - ▶ Certified zero-carbon energy

*Securing an optimal site represents a significant milestone in the project's development*

### Newport, WA Aerial View



### Box Canyon Dam Power Plant

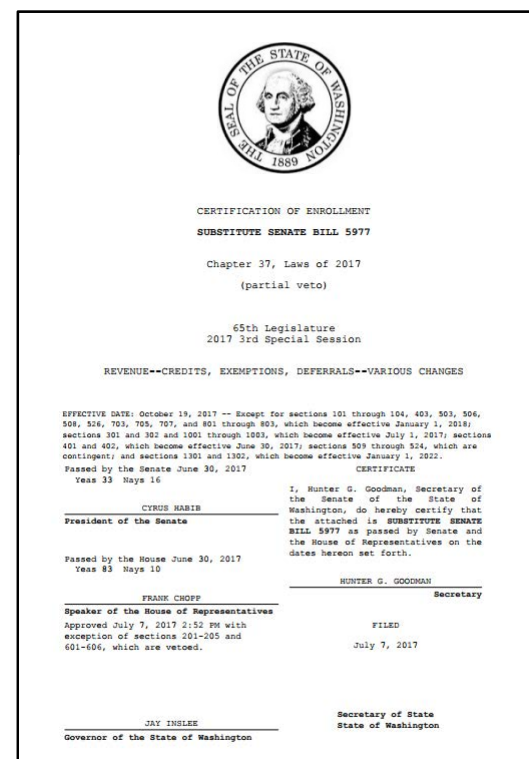


# Project Overview



## Regulatory and Government Support

- In August 2016, HiTest received designation as a Project of Statewide Significance by the Washington Department of Commerce and Washington Governor Jay Inslee
  - Washington officials recognized the alignment of HiTest with the Commerce's commitment to strengthening underserved and rural communities while providing significant economic benefits to Pend Oreille and surrounding counties
  - This designation for voluntary expedited permitting treatment by local governmental bodies
- Governor Inslee and both the Senate and the House of Representatives passed Senate Bill 5977, which included provisions related to the silicon manufacturing industry "...encouraging job creation and retention in rural economies through the transparent and accountable provision of targeted tax relief for silicon smelters..."
  - This legislation "extends tax preferences that support the solar silicon manufacturing industry from 2018 to 2028"
  - Offers incentives for power providers, as the bill "establishes a public utility tax and business and occupation tax credit for a utility that sells manufactured gas, natural gas, or electricity to a silicon smelter"
- HiTest is using standard regulatory protocols to obtain requisite permits.  
*(An earlier version of this presentation stated the Governor also has the ability to authorize all permits required for the plant, but that is inaccurate.)*

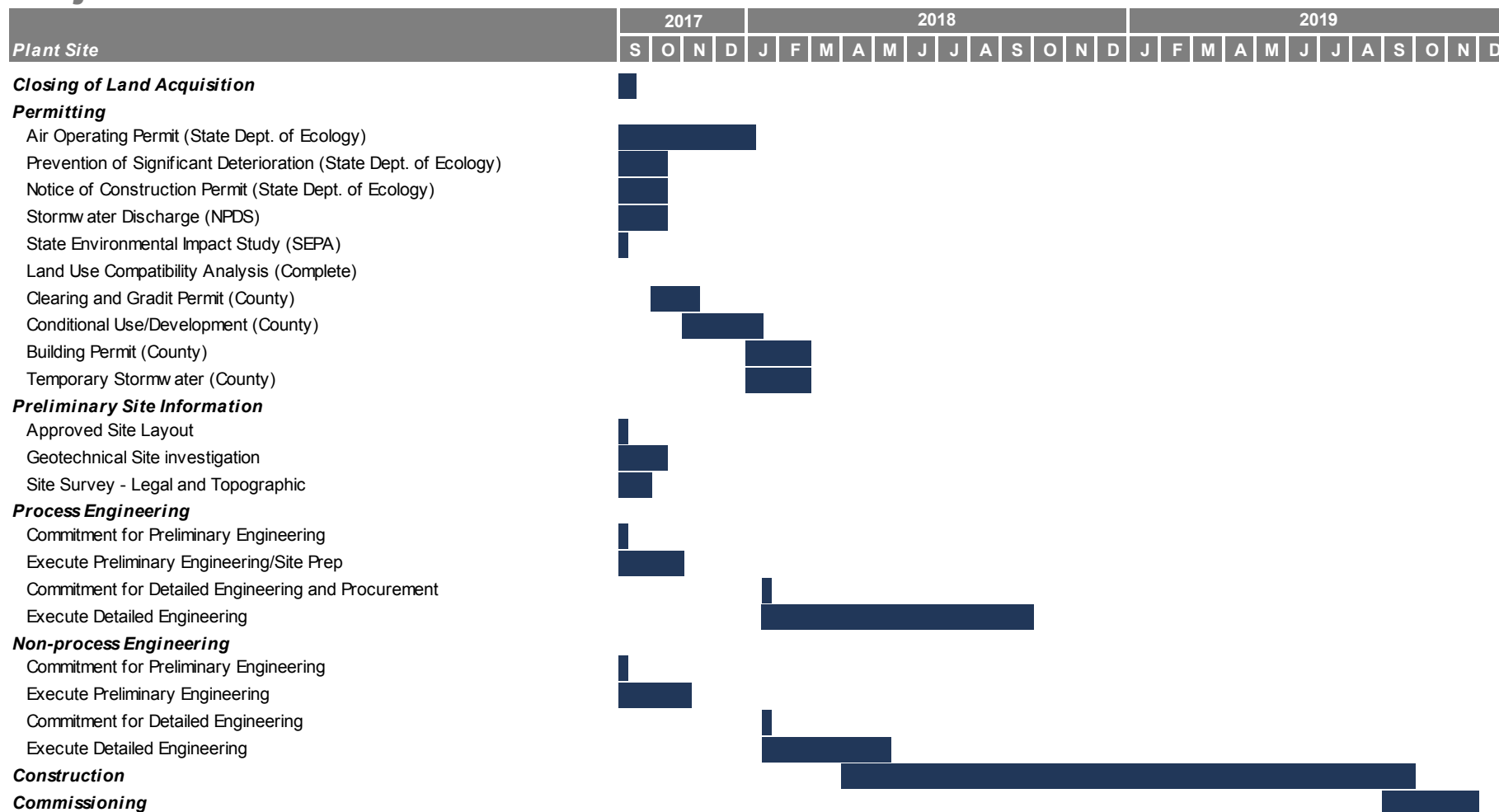


**Strong governmental support is enabling HiTest to compress its construction timetable**



# Project Overview


## Projected Timetable – Plant Site





# Project Overview

## Relevant Parties – Engineers, Contractors & Critical Vendors

Party	Vendor	Description
<b>General Contractor</b>		<ul style="list-style-type: none"> <li>With a combined staff of 6,000 employees, Turner/Clark completes over \$10 billion of construction on 1,500 projects each year in the U.S. and Canada</li> <li>With offices in Edmonton and Seattle, Turner/Clark offers HiTest the accessibility and support of a local firm with the stability and resources of a multi-national organization</li> </ul>
<b>Non-process Engineering</b>		<ul style="list-style-type: none"> <li>Sacré-Davey provides engineering services &amp; project management for mining, process industries, ports &amp; marine, oil &amp; gas, cleantech, chemicals, food &amp; beverage and pulp &amp; paper</li> <li>With a 31 year history and growing offices in Vancouver, Seattle, Calgary, Toronto and Montreal, Sacré-Davey has strong technical and local professional expertise to support multi-jurisdiction projects</li> </ul>
<b>Process Engineering</b>		<ul style="list-style-type: none"> <li>Ternova, a division of the Techint Group, provides the design and supply of equipment, technology and project services for the mining and metals industries, and has a global presence with over 3,200 professionals located in 24 countries</li> <li>Ternova Pyromet provides the design and supply of high capacity submerged arc furnaces and associated smelter equipment for the production of ferroalloys and base metals</li> <li>Techint Group, founded in 1945, has companies operating worldwide in steel and special piping manufacture, healthcare, engineering and construction and oil and gas, with 65,800 employees and annual revenues USD \$16 billion</li> </ul>
<b>Environmental</b>		<ul style="list-style-type: none"> <li>Comprised of 13,000 consulting engineers, scientists, designers and management consultants are committed to creating sustainable and long-term solutions for customers and society</li> </ul>
<b>Legal</b>		<ul style="list-style-type: none"> <li>Fasken Martineau is a leading international business law and litigation firm, founded through the merger of three regional Canadian icons in 2000</li> <li>Currently, Fasken Martineau has eight offices with more than 700 lawyers across Canada, the UK and South Africa</li> </ul>

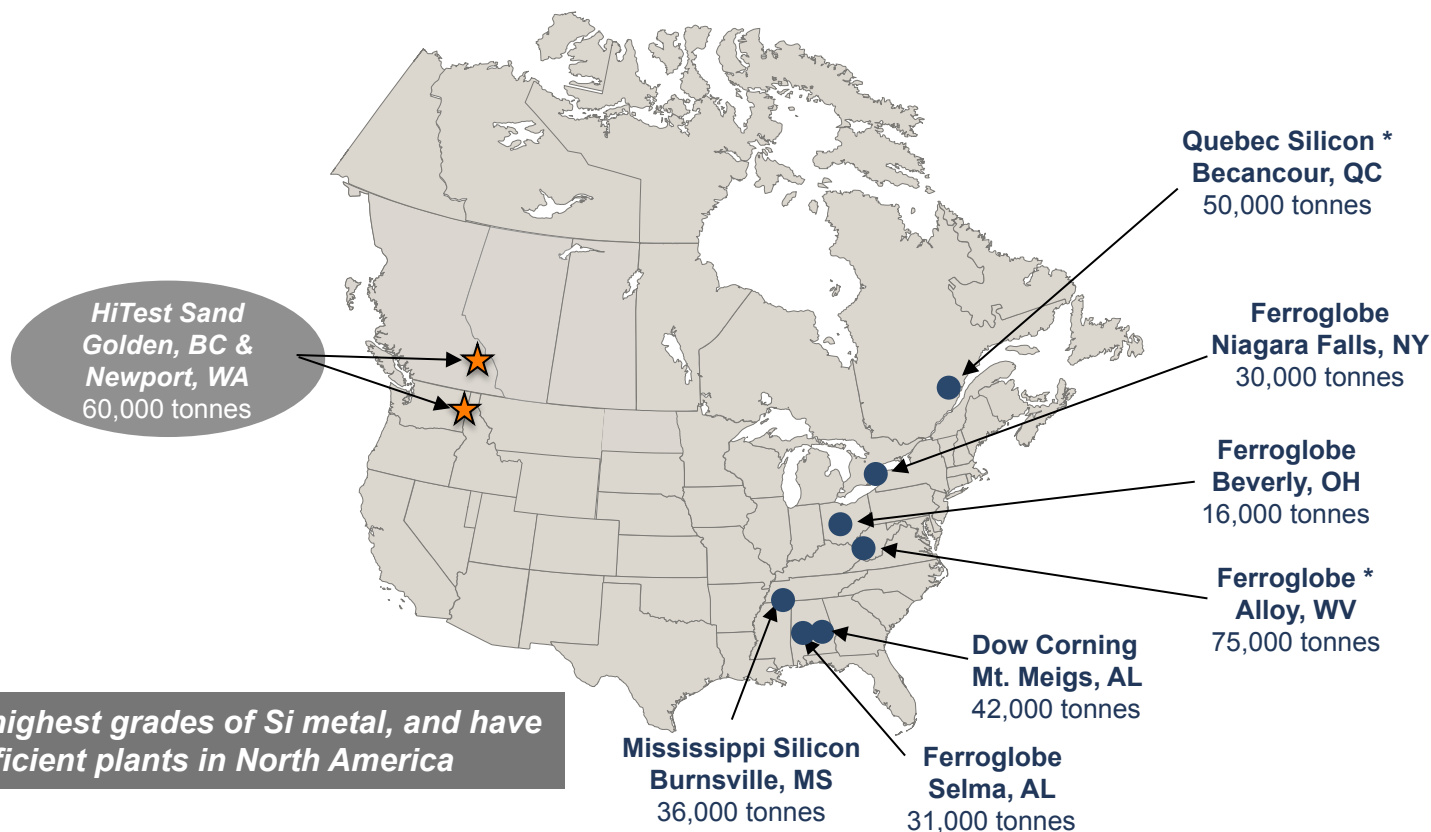




# Project Overview

## North American Silicon Metal Producers

- There are two primary producers of silicon metal in North America, as well as a third smaller producer in Mississippi Silicon that commenced production in 2013



\* Represents 100% of site capacity, including 51% interest owned by Ferroglobe and 49% interest owned by Dow Corning



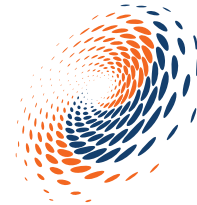


### III. Quartz Mine Overview

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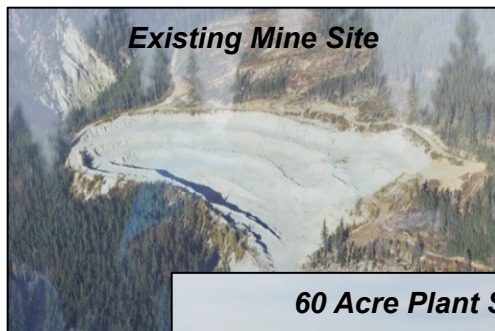




# Quartz Mine Overview

## HiTest Sand Golden, BC Project

- The mine site in Golden, BC is located on a 500+ acre perpetual lease with the government in British Columbia, and is strategically located to transportation outlets, including Highway 95 for trucking and the Canadian Pacific Railway



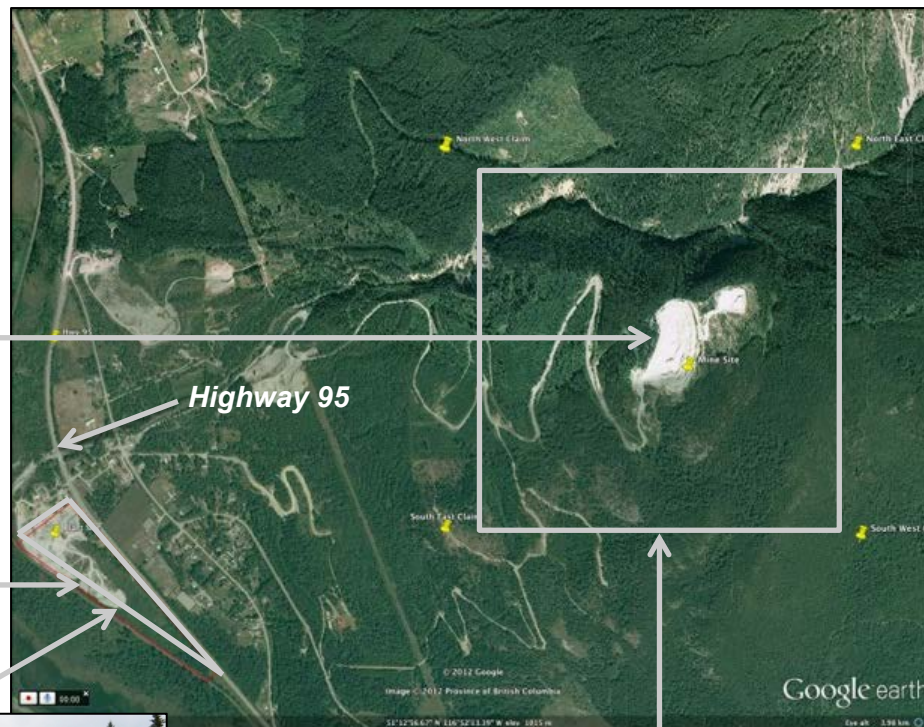
**Existing Mine Site**



**60 Acre Plant Site**



**Adjacent Rail Spur  
(Canadian Pacific)**



**Highway 95**

**Crown Lease for 555 Acres**

HiTest owns a fully permitted world-class quartz resource in Golden, BC, with approximately 81 million tonnes of proven and probable reserves, and is permitted for 800,000 tonnes of annual production

## **II. Company Leadership**

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# Company Leadership

## Company Leadership – Executive Management

**Jayson Tymko**  
*President, Director*

- Previously founder of Menex Technologies Inc., which designed and built artificial intelligence to optimize gas well production and monitoring services
- Formerly a Director and Partner of Regent Power and Compression and former Director and co-founder of Verdex Energy Solutions
- Currently Director and Partner of Nickel Financial, creator of the Native Gaming Act as well as ownership of two casinos in Alberta (complete project budget +\$300M)

**John Carlson**  
*Vice President, Director*

- Current President of Carlson Capital Corporation
- Co-founder of Verdex Energy Solutions (Oil & Gas finance and leasing), and formerly Director and Partner of Regent Power & Compression (natural gas compression and generation)
- Previously Senior Advisor with National Bank of Canada and 2007 National Bank Financial President's Club

**James B. May**  
*Chief Operating Officer*

- Previously was President and CEO Dow Corning Silicon Energy Systems, where he was responsible for product line, manufacturing and supply chain; Mr. May successfully grew Dow's Silicon metal business from \$50 million to \$300 million over a five-year period
- Chairman of Dalian Dow Corning Silicon Ltd, and Board Member of CBCC Silicon Brazil

**Michael Wilde**  
*Chief Financial Officer*

- Previously was VP of Finance for Jade Drilling, assisting to build and lead Canada's largest private drilling contractor, prior to acquisition by Trinidad Drilling
- Former Tax Manager at KPMG
- CA with Cooper and Lybrand

**Wayne Buck**  
*Chief Technical Officer*

- Dow Corning Corporation; Midland, Michigan 1972-2001, where he held titles of Silicon Process Engineering Supervision and Quality/Technical Team Leader
- Led silicon quality/technical team that worked with suppliers to improve silicon quality and reduce costs
- Developed new silicon process technology; completed economic evaluation of silicon plants and new technology
- Led quality/technical team responsible for supplier coordination and performance improvement; completed extensive economic evaluation of silicon smelters in U.S. in support of silicon procurement strategy development



# Company Leadership

## Company Leadership – Board of Directors

**John Carter FCA ICD.D**  
*Chairman*

- 30+ years of finance and accounting oversight, corporate governance and risk management as a corporate director of publically traded companies, as well as Crown corporations
- Ernst & Young, Atlantic Managing Partner 1994 – 2002
- Member of Canadian Partnership Board 1999 – 2004
- Current Board Chair of Nova Scotia Teachers Pension Fund Trustee Inc.

**Sunir Chandaria**  
*Director*

- Director, Conros Corporation, with oversight of investments and relationships in emerging markets
- President, LePage's 2000, Inc.
- Director, Ontario Lottery & Gaming (OLG), Member of the ARMC and IT Advisory Committee
- Member and Education Officer, Young Presidents' Organization (YPO), Toronto Chapter
- Queen Elizabeth II Diamond Jubilee Medal Recipient

**John Turner**  
*Director*

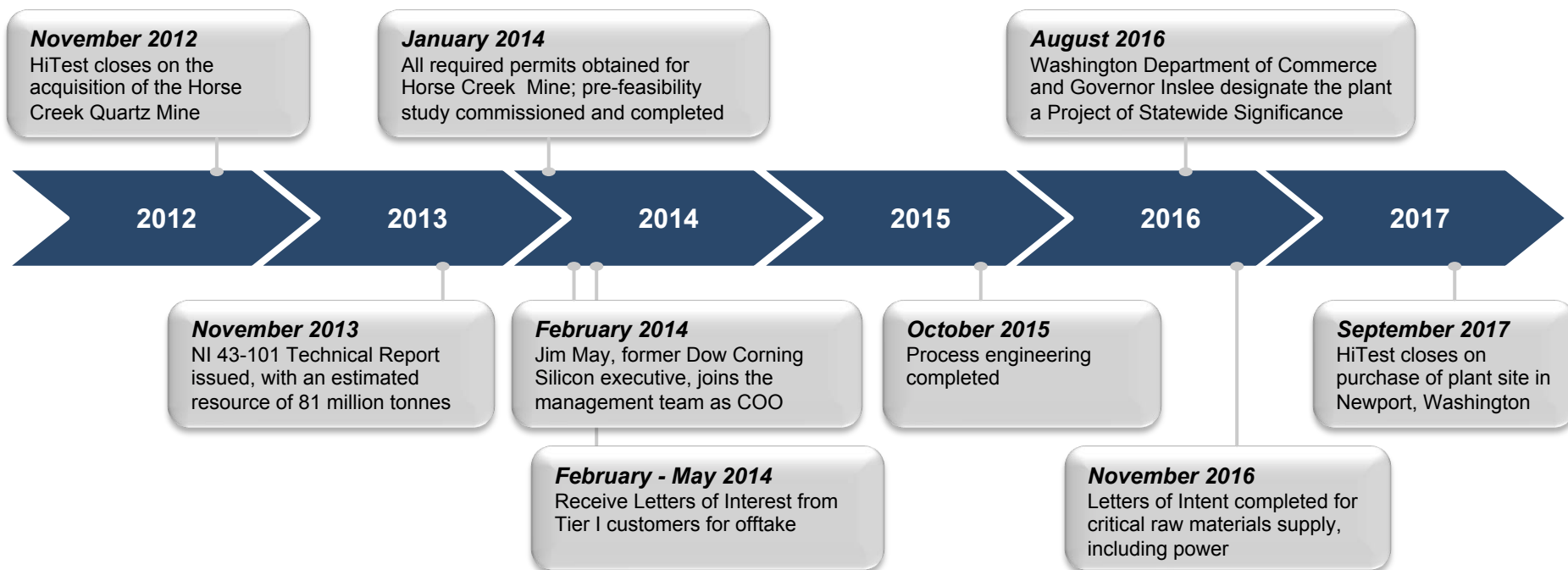
- Partner Fasken Martineau | Global Mining Group Leader
- Best Lawyers 2015 Natural Resources Law Lawyer of the Year in Toronto
- The Best Lawyers in Canada for Natural Resources Law 2006 - 2017 and 2017 for Mining Law
- Chambers Global 2012 - 2017 for Energy & Natural Resources: Leading Canadian Firms
- Chambers Canada 2016 and 2017 for Energy & Natural Resources: Mining
- Recipient, Queen's Golden Jubilee Medal



# Project Overview Milestones

## Project History – Significant Milestones

- Since the acquisition of the Horse Creek Quartz Mine in 2012, the Company has achieved several significant milestones on its path to develop the project, which is now turnkey
  - Management and co-investors have invested over \$20 million to-date in the project, including capital spent on reserve development and engineering, land acquisition costs and plant engineering



# Summary



## *Environmentally Friendly High Paying Jobs for Local Residents*

- Production process does not require or produce any heavy metals or hazardous chemicals as by-products
- All materials required during production process and consumed leave the plant as a saleable product
- Closed loop system for water, that only consumes 8,000 gal/day, plus sanitary water for workers
- Direct employment: 150+ workers
- Additional indirect employment: 750+ workers
- Two year construction period with \$325 million of capital remaining, requiring an estimated 250 - 400 construction workers

## *Committed and Invested Governmental Agencies*

- Local and state officials have been closely involved with and extremely supportive of HiTest's development, with the Washington State Department of Commerce designating the plant a Project of Statewide Significance
- Management has developed a relationship with the Governor of Washington, who has publicly recognized HiTest as a leading innovator in supporting a clean energy economy, providing hundreds of direct and indirect jobs for the local community while reducing the state's carbon footprint

## *Invested and Proven Management Team*

- The management team has extensive experience in the silicon metal market, with previous responsibilities leading process engineering, product development, quality and technical support, and supply chain management at some of the most recognized global silicon metal producers
- Management and its co-investors have invested approximately \$20 million in the business to date, including the acquisition of the quartz mine and funding project development and engineering for the silicon metal plant
- Accomplished Board of Directors has been assembled, with legal and financial expertise in the metals & mining sector obtained over decades of experience at recognized firms



# Contact Details

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HiTest Silicon Inc.  
5241 Calgary Trail Unit 601  
Edmonton Alberta T6H 5X8

B: (780) 328-6542

F: (780) 328-6543

Jayson Tymko

[jtymko@hitestsand.com](mailto:jtymko@hitestsand.com)

John Carlson

[jcarlson@hitestsand.com](mailto:jcarlson@hitestsand.com)