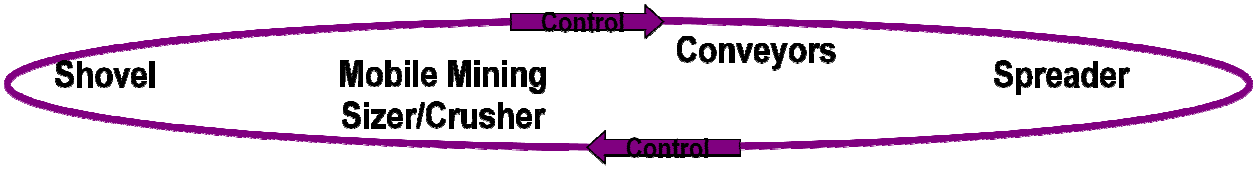
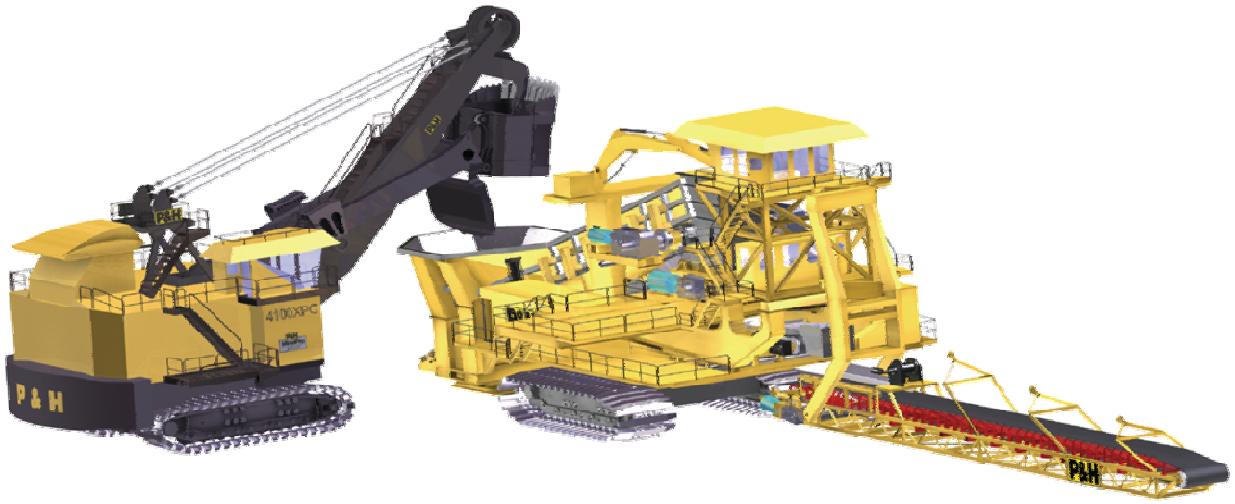
# *Mining & Processing — From Overburden Removal to Process of Diamond Recovery*

1. **Pre-stripping**: conventional earth-moving equipment strips sand and clay layers down to boulders/top of till.

2. **Overburden removal**: Electrical-powered IPCC (integrated in-pit crusher and conveyor system) removes overburden (till to top of kimberlite) and conveys it to the overburden pile located outside of the pit.




Shovel

Sizer

- 20,000 tonnes per hour capacity to remove overburden and waste rock
- 4 *electric-powered shovels* with 42 m³ capacity (including one spare)
- 4 fully *mobile electric crushers/sizers* (including one spare)
- 4 in-pit transfer *electric conveyors* (including one spare)
- cross-bench conveyors
- up ramp conveyors
- overland conveyors to stacker/spreader at overburden pile (one conveyor from Star, one from Orion South)

3. **Overburden pile**

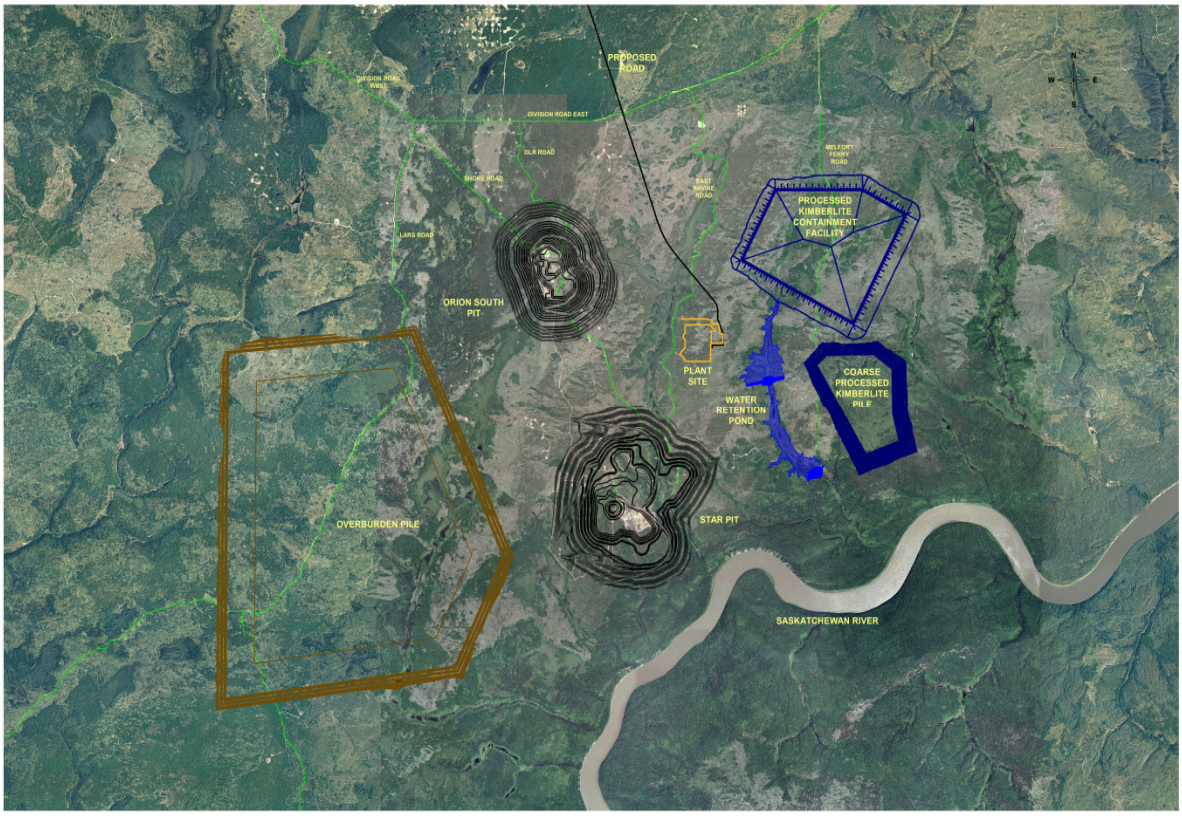
- hill from overburden approximately 912,000,000 m³
- approximately 60-80 m tall
- approximately 22 km²
- sloped, contoured with rise of three horizontal steps to one vertical
- can be planned/contoured for recreational use, e.g. ski hill, after mine closure
- some overburden may be diverted for use as hydroelectric dam fill or, in part, gravel for road building or maintenance

4. **Kimberlite removal**

- truck and shovel with semi-mobile crusher
- conventional electric hydraulic *excavators* remove 40,000 tonnes per day kimberlite which is loaded into:
  - → 136 tonne capacity *diesel haul trucks whic*h dump the kimberlite into
  - → mobile *electric crushers/sizers*, in-pit, which release *the kimberlite t*o
  - → in-pit cross-bench then up ramp and overland electric *conveyors*, which convey the kimberlite to
  - → the *processing plant* (except uneconomic, low-grade kimberlite ore, which goes to an unprocessed kimberlite pile and can be processed at end of mine life)

5. **Processing plant, processed kimberlite piles**

- 40,000 – 45,000 tonnes per day kimberlite processed
- 14.3 million tonnes per year kimberlite ore to be processed
- anticipated mine life of 20 years
- processing plant separates diamonds from kimberlite. The process is environmentally safe, using only water and iron-rich sand, free of hazardous chemicals or byproducts.
- processing plant has 3 outputs: diamonds, processed kimberlite (< 1 mm) and coarse processed kimberlite (1 mm-45 mm)
- *diamonds* separated from kimberlite and secured
- *processed kimberlite* goes to Processed Kimberlite Containment Facility (PKCF), eventual height approximately 55 m. Water is 70-85% of processed kimberlite material and would be removed/reused in processing. Processed kimberlite only; no hazardous chemicals or byproducts.
- *coarse processed kimberlite* goes to Coarse Processed Kimberlite (CPK) Pile, eventual height approximately 54 m. Processed kimberlite only; no hazardous chemicals or byproducts. May be reprocessed in future to extract diamonds.
- all piles, i.e. overburden, processed kimberlite and coarse kimberlite to be reclaimed/revegetated during and after mine life.



6. **Other infrastructure**

- access corridor (road, communication lines e.g. SaskTel fiberoptics link, TransGas 4" natural gas line): south from Highway 55, Shipman to site, 35.6 km to be paved, 10.6 km over existing grid, 25 km generally over existing forest roads. Provincial secondary highway grade standard. One river crossing over White Fox River.
- power line: 230 kV line, from the southeast, stepped down on site to 25 kV, estimated nominal and peak demand loads of 112.8 mW and 123.1 mW on site
- processing plant, including geothermal for most heating and cooling requirements, and associated buildings
- explosives mixing and storage facility
- fuel and lubricant storage and distribution facilities
- potential gravel screening and washing facility
- security structures, administration/changehouse building, maintenance and technical services building, warehouse and cold storage building, vehicle wash facility, warm-up shed, and fire and emergency response building
- waste management facilities
- 50 tonne per hour sample Dense Media Separation plant for exploration and audit purposes
- helicopter landing pad

7. **Pre-production capital costs:**

| | |
|---|---|
| • post-exploration and development work | $251 million |
| • equipment | $454 million |
| • processing plant, infrastructure | $833 million |
| | $1.538 billion |

8. **Potential timelines**

- construction — late 2011-2015
- production — 2016-2036