SAKHALIN COAL PROJECT

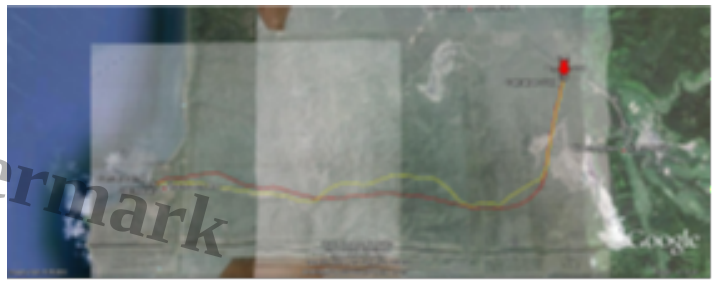
Description

Industry: Mining | Service: Feasibility Study

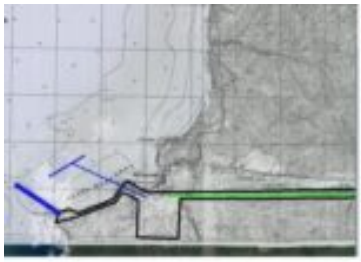
FEASABILITY STUDY

SakhalinCoal determined that the market for its coal at their mine on Sakhalin Island in Russia was abundant; however, increasing mine production to 5 MTPY with future expansion of 10 MTPY was met by challenges and limitations. These included:

- Consistency of mine production.
- Ability to transport coal efficiently from mine to port.
- Limit to size of ships in current port.









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Baran Industries and Infrastructure Ltd were commissioned by Sakhalincoal to perform the first stage of the mine upgrade project definition. Ahead of the expansion, Dos Santos was retained by Baran Industries as material handling experts to assist in the overland conveyor routing, conceptualization and engineering. Assistance was offered in planning, conceptualizing and engineering of the following:

- 1000 tph, 17 km overland conveyor
- Port storage facilities
- Yard conveyors
- Stackers and stacker reclaimers
- Dock layouts
- 4000 tph, 1.5 km marine conveyor to the new dock structure
- 3000-ton dock surge bin
- 4000 tph ship loader systems

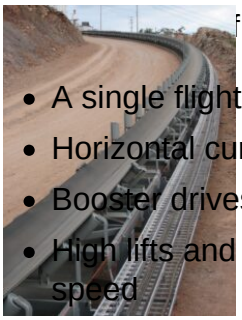
The first task was to identify and define the land area required for the overland conveyor and port facilities. This first required the investigation of alternate routes for the overland conveyor with the purpose of choosing the best route over a mountainous area. Accordingly, elevation and coordinate data was collected and tabulated using data from Google Earth and Geocontext software. The conveyor paths were each assigned pros and cons according to their overall length, variations in

elevation, obstacles that must be crossed, and necessity of truss spans to avoid rough terrain.

CONVEYING METHODS CONSIDERED

In the study, several methods and paths were considered to optimize cost efficient means of transport as well as storage options. In comparing different methods of handling, the study determined that a conventional conveyor will be the preferred option for the application at Sakhalin. Pipe conveyors, cable belts, and Rope-ConsÂ® were each considered, and could be beneficial in other applications.

However, the conventional troughed conveyor has the proven background and low-cost that made it the proper choice for Sakhalin.



f conventional conveyors at the Sakhalin application:

- A single flight conveyor can be as long as 20 km.
- Horizontal curves can be negotiated through the path
- Booster drives can be employed to reduce belt tension
- High lifts and high capacities are easily handled by proper sizing of equipment and setting of belt speed
- Replacement/upgrade parts are readily available on the world market

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INTERMEDIATE STORAGE

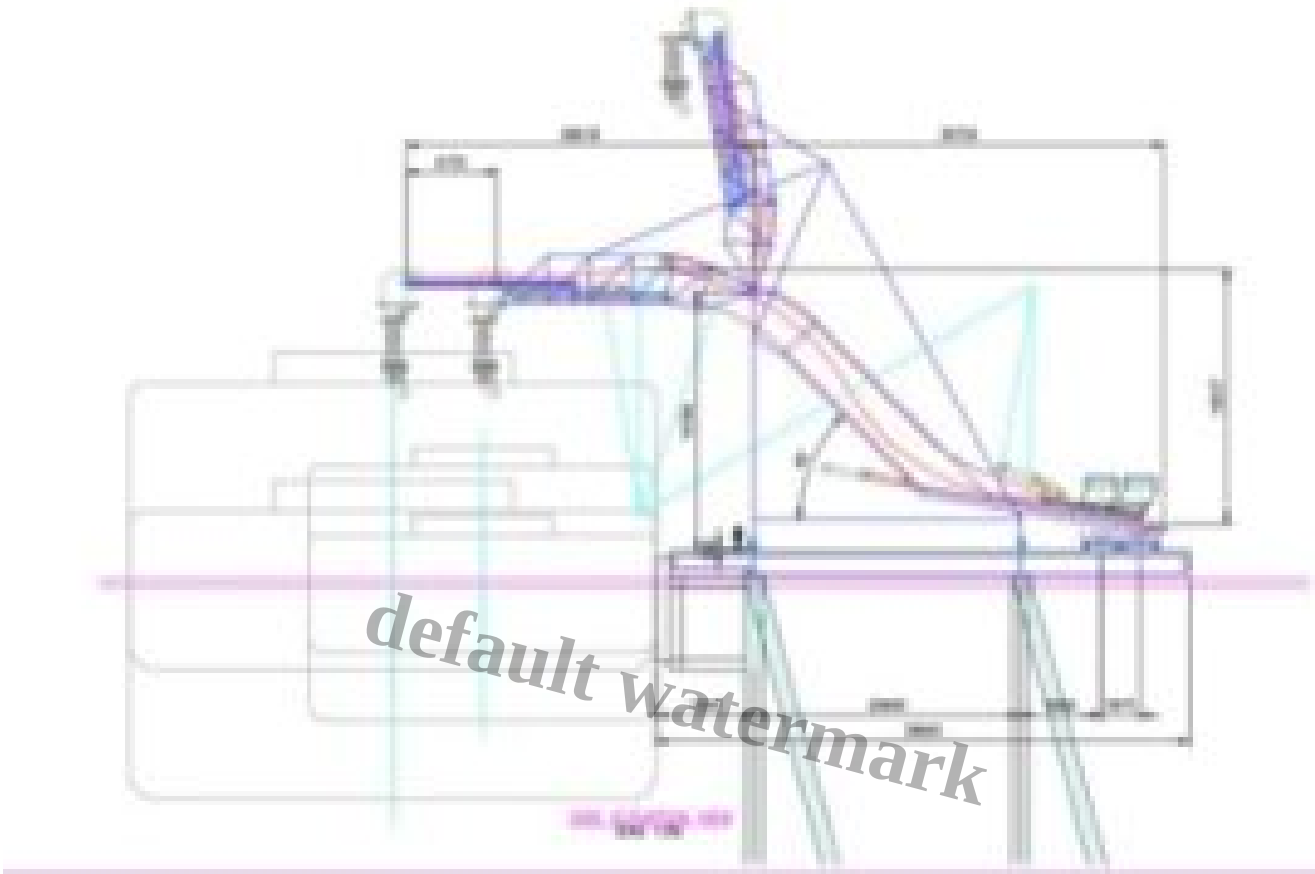
To meet the Sakhalin require



ıl storage is required at the mine and at the port. At the mine, the storage requirements are modest enough to buffer the mine production to ensure continuous loading of the overland conveyor. At the port the storage requirements are more significant. Enough coal must be stockpiled so that when several large ships arrive in succession the coal stockpiles will not be depleted. As a rule of thumb, for large vessels this will require a stockyard that can accommodate about 10% of the yearly throughput. The current stage of the study involved comparing the system with 1) coal storage at the port; 2) placing storage at the mine and; 3) loading the ships directly from the mine.



Stationary Ship Loader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DOCK

Dos Santosâ??s work revealed advantages in a high angle shiploader system to save dock cost. This arrangement allowed the new dock to be of a much smaller size than would be necessary if using a low angle conveying solution. Further, the loading arrangement at the dock was analyzed to determine the proper amount of surge capacity during the moving of a shiploader from one hold to another. As a result, a 3000-ton surge bin was designed into the flow, allowing approximately half an hour worth of material to back up during a shiploader transition.

SUMMARY

Using advanced data gathering and analysis techniques, Dos Santos was able to offer a comprehensive study for the SakhalinCoal company, assisting them in efforts to expand their operations more than five-fold. The materials handling engineering capabilities of the company were extremely valuable to the client in determining the optimal methods for this large expansion.

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Contact DSE to discuss high-angle conveyor engineering for your mine or industrial facility.

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