

until the nozzle is cleared by the attendant, or the other exciter unit started up. The deflecting nozzles of the exciters are arranged for hand regulation for the exterior of the wheel case through worm gearing.

The contract for the entire electrical equipment has been awarded to the Westinghouse Electric and Manufacturing Company and includes the apparatus



Showing Dump at Coquitlam.

for the generating station and the sub-stations at Vancouver and Burnaby. The three 1,500-k.w. 60 cycle, 2,200 volt alternators for the power station are of the rotating field type, and are arranged for a movement of the external frame in a direction parallel to the shaft, to allow access to the windings.

For the control of the apparatus at the power station, the switchboard will contain nine panels, one for the induction motor and one for each exciter, three panels for control of the main units, and three for the control of the three sets of 550 kilowatt air cooled



Ventilating station at Coquitlam Heading.

transformers, with their motor blower sets, consisting of 20-horsepower motors and 110-inch Sturtevant fans.

The step up transformers, static interrupters, high potential switches and lightning arresters will be in-

stalled in a separate building located on the hill above and just back of the power house. As the static interrupters contain oil they will be separated from the main room and each other by brick partitions.

The machinery for the sub-stations includes the usual transformers, rotary converters, switchboards, etc., for the reception and distribution of transmitted power.

The route of the transmission lines to Vancouver is sixteen miles in length, and involves the crossing of a navigable arm of Burrard Inlet, with a span of 2,800 feet. On one side two steel towers 140 feet in height will be erected to support twelve 9-16 inch galvanized plow steel cables with wire centres, but on the opposite side there is high ground and the cables will be supported on poles.

Two independent transmission lines, each consisting of two 3-wire circuits, of No. 2 copper, will be constructed on the same right of way, to a point near Barnett. From here one line will be continued to Vancouver and the other to Burnaby.

A transmission line already exists between Burnaby and Vancouver, which will be reconstructed to carry 20,000 volts, the pressure to be used on the new lines, and a new line will be built from Burnaby to New Westminster, thus providing what is in effect a double transmission line over the entire distance between the power station and each of the sub-stations.

Mr. Wynn Meredith, consulting engineer of the Engineering Offices, of San Francisco, is directing the entire work, assisted by Messrs. Hermon & Burwell, civil engineers, of Vancouver.

Mr. R. H. Sperling, chief engineer of the B. C. Electric Railway Co., is supervising the work on behalf of the B. C. Electric Railway Co., whose shareholders hold the controlling interest in the Vancouver Power Co.

TREATMENT OF LOW-GRADE COPPER ORES.*

(By Dr. Edward Dyer Peters.)

INTRODUCTION.—In the introduction of Mr. Muir's paper reference was made to the fact that extremely low-grade ores are treated in the Lake Superior district of the United States of America, one of the mines actually finding it profitable to work an ore that contains only 0.65 per cent. of copper, or 13 pounds of the metal to a ton (2,000 pounds) of the ore.

It seemed to the writer that when making use of Lake Superior results, as a standard of comparison, in a paper on the treatment of sulphide-ores of copper, reference should be made to the fact that the conditions at Lake Superior are extraordinary, and unparalleled anywhere else in the world. It is, of course, well known to all who are interested in copper that this metal, in the Lake Superior veins, occurs in minute (and sometimes large) particles of pure metal, that only require a cheap washing process to be recov-

*From a paper read before the Institute of Mining Engineers.