

CHAPTER – VII

INPIT CRUSHING, INPIT COAL TRANSPORT, COAL HANDLING PLANT AND DESPATCH

7.1.0 Introduction :-

7.1.1 In the approved project report for Gevra Opencast Expansion (25 Mty) it was proposed to produce coal from lower Kusmunda seam (combined, top and bottom), upper Kusmunda Seam, Seam E and Seam F from three sections namely Eastern section, Central Section, Western Section.

7.1.2 In the approved project report for Gevra opencast Expansion (25 Mty) it was proposed to install 10 numbers (5 nos. in the central inpit and 5 numbers in South West inpit) of semi mobile crushing units consisting of primary sizing units, secondary sizing units, associated equipment for crushing of (-) 1000 mm size coal produced from LK seam to (-) 100 mm size lumps. These units will be installed on the floor of lower Kusmunda seam and will to be shifted to new locations as and when required so as to keep the lead distance of dump trucks used for coal transport within 2 km. The following inpit conveyor system was provided in the approved expansion report (25 mty.).

- Belt conveyor C1, C1A and C2, C2A in series were provided from contour level of (+) 170 m upto surface in central Inpit.
- Belt conveyor SW1, SW1A and SW2, SW2A in series were provided from contour level of (+) 150 m upto surface in south Western inpit.

The luffing conveyor provided in the semi mobile crushing unit will discharge the crushed coal on any one of the Inpit conveyors. The inpit conveyors will be laid along the floor in haul road for transport of coal to surface.

7.1.3 In addition to the existing CHP one more CHP was proposed to handle the coal and loading through silos in public rail wagons for dispatching to distant consumers. The CHP on surface will have the following facilities :-

- i) Surface belt conveyors
- ii) Overhead surge bunker 10,000 t. capacity
- iii) Transfer hopper TH2 – 500 t. capacity
- iv) Stacker-cum-reclaimer for making ground stoc of 100000 t. capacity

14/6/11
General Manager
गेवरा क्षेत्र
Gevra Area

- v) Two numbers of silos each of 4000 t capacity alongwith hydraulic swing chute with flow control gate
- vi) Creep controlled diesel engine for hauling a rake of wagons under the silos during loading
- vii) Truck loading arrangement
- viii) Truck receiving arrangement
- ix) Inter connection between existing CHP and the proposed new CHP
- x) Weighment of wagons on in motion weigh bridges
- xi) Automatic sampling system
- xii) Associated equipment and items

7.1.4 One number of mini CHP consisting of 2 nos. of semi mobile crushing units, associated belt conveyors, truck loading station (consisting of 4 x 100 t. capacity steel hoppers) was proposed on surface for handling coal produced from upper Kusmunda seam, E&F seams through NE flanks. Coal from hoppers will be transported to CHP or to the customers by means of trucks.

7.1.5 Two numbers of semi mobile crushing units were proposed on surface for handling coal produced from upper Kusmunda seam, seams F&F through SW flanks. Two numbers of conveyors SWF conveyor - 1, SWF conveyor - 2 were proposed for transportation of coal from the crushing units on surface upto the proposed CHP.

7.2.0 Proposed Expansion :-

7.2.1 The revised linkage of coal in the proposed expansion report will be as given below :-

NTPC, Korba	- 12.75 mty.
BALCO	- 4.15 mty.
ACB washeries	- 11.00 mty.
PRVUNL (RSEB)	- 6.50 mty.
CP & CBL Washery	- 0.60 Mty.

Total

35.00 mty.

7.2.2 In the expansion report (25 - 35 mty) an option was worked out to introduce surface miners for coal winning which can produce (-) 100 mm size coal. In that case the semi mobile crushing units may not be required for crushing of coal and some arrangement is required for receiving of coal from the trucks for loading on to Belt conveyors. Further there is some change in the linkage pattern, mode of transportation by the customers, increase in area operation, change in the over burden dumping pattern, constraints on surface. In view of the above reasons the provisions made for inpit transport system, Coal handling plant in the

approved report (25 mty.) needs some revision. The revision may need some additions, some deletions etc.

7.2.3 Details of the proposed changes in the provisions of 25 mty report for inpit system are as given below :-

Modifications due to the introduction of surface miner :-

- i) Procurement action of 14 nos. of semi mobile crushing units (10 numbers inside the mine, 4 numbers on surface) need not be taken up as the surface miner will produce (-) 100 mm size coal.
- ii) Provision of 12 nos. of truck receiving stations (8 numbers inside the mine, 2 nos. for SW flank, 2 nos. for NE flank) for receiving coal from the dump trucks and feeding to the out by conveyors. Each receiving station will consist of three numbers of 40 t. capacity overhead steel hoppers, vibratory feeders (400 tph), associated belt conveyor, other equipment, civil and structural works. These have been proposed for receiving coal from trucks in place of the semi mobile crushing units.
- iii) Deletion of surface belt conveyors SW1 and SW2 for carrying coal from SW flank to CHP because OB dumps are made along the conveyor alignment and it is difficult to install the conveyors over the O.B. dumps.
- iv) In the central inpit section, the existing alignment of J1/K1 conveyors will follow. Additional conveyors will be required for extension of belt conveyors upto + 50 m and some modifications to suit the existing mine conditions.
- v) Change in the specifications of the belt conveyors proposed in the south western inpit access trench to suit the existing and proposed dump layouts.
- vi) Truck receiving station near 'R' stream conveyor to receive coal produced through flanks.
- vii) Introduction of surface miner, construction of inpit conveyor system alongwith truck receiving stations will take some time so to meet the immediate coal crushing needs additional 3 numbers of feeder breakers (400 tph.) alongwith the power supply needs, civil structural works will be provided. These will be diverted to other mines of SECL after their utility in this project after the introduction of surface miner, truck receiving stations, inpit belt conveyors etc. are constructed.
- viii) Additional electronic weigh bridges for weighing raw coal and finished coal as per the directives of CIL.

7.2.4 Coal handling plant

- i) Provision of additional truck loading station consisting of 4 x 100 t. capacity steel hopper, V feeders, associated conveyor / equipment etc.
- ii) Minor modification in the system due to existing site conditions.
- iii) Addition of air blasters level indicators, temperature sensors, lining in RCC bunker for better operation and control.
- iv) Addition of two numbers of 100 t. capacity in motion weigh bridges for standby on load side of the railway track to act as standby.

7.2.5 Mini CHPs on surface for coal produced through flanks:

- i) Three (1 number for NE flank and 2 numbers for SW flank) more mini CHPs consisting of truck receiving stations, associated conveyors, 4 x 100 t. capacity steel hoppers, V, feeders, other equipment, associated civil and structural works will be constructed in addition to the one number provided in expansion PR (25 mty.) to meet the requirement.

7.3.0 Proposed system as per PR (25-35mty)

7.3.1 Inpit crushing and conveyor transport system :

- i) Crushing section – The cutter drum of the proposed surface miners cuts coal upto (-) 100 mm and leaves on the ground so semi mobile skid mounted crusher units provided for crushing of coal to (-) 100 mm size need not be procured. Hired pay loaders will load coal into the hired trucks of 10 t. / 20 t. capacity for transporting coal to the coal receiving stations.

i) Coal receiving stations :-

- a) Eight numbers of truck receiving stations (4 numbers in Central inpit and 4 numbers in South Western inpit) will be provided inside the mine (for LK seam only) for receiving coal from the tipping trucks of 10 t/20t capacity. The truck receiving stations will be shifted inside the mine periodically so that the lead distance of trucks inside the mine will be kept at 2 km. (minimum).

- b) Each truck receiving station will consist of 3 numbers of 40 t. capacity overhead steel hoppers for receiving coal from tipping trucks. Vibratory feeder of 400 +/- 20% tph. Capacity will be provided below each

hopper for reclaiming coal from the hopper and loading onto belt conveyor (D1/D8) of 1200 mm wide, 800 tph. Capacity. Out of the three vibratory emergency all the three feeders may operate. The belt conveyors (D1/D8) will be provided with a motorized two way chute with a flap gate at its discharge pulley so that coal can be loaded either of the two input conveyors.

- c) Out of the four receiving stations provided in C1 input and SW input three will be in operation and fourth one will be standby.

ii) Input conveyor system

- a) Two alternative alignments of input conveyors were studied for central input taking into consideration the parameters such as increase in mining area, change in the internal dump area etc. It was agreed that the alignments as existing will continue. The alignment of conveyors in south western input will be same as that provided in the approved expansion report (25 mty). The alignments are shown in the enclosed plan (Fig. 7.4).
- b) Central Input :- Two streams of belt conveyors i.e. J and K series will be provided for transporting coal from + 50 m (ultimate) level to surface. One of the streams will be in operation and the other standby. In each stream six numbers of belt conveyor (J1 to J6, K1 to K6) will be provided in series. All the conveyors of 1600 mm wide, 2300 tph. (nominal) capacity. The existing 1400 mm wide J1, J2, K1, K2 belt conveyors will be replaced by 1600 mm wide conveyors. Conveyor J1 will discharge coal in the proposed TH2 of 500 t. capacity and K1 will discharge coal on conveyor M1 provided in the proposed CHP. The existing conveyor C3 and C4 will be extended backward to receive coal from the TH2. In this way coal from central input can be transferred to existing CHP through TH2 and proposed CHP. The new conveyors J3 to J6 and K3 to K6 will be laid in line of the existing K2/ J2 conveyors
- c) South Western Input :- Two streams of belt conveyors P and Q series will be provided for transporting coal from 210 m level inside the mine upto surface. These will be laid parallel to the existing 'L' series belt conveyors. In each stream 3 nos. of belt conveyors

(P1 to P3, Q1 to Q3) will be provided in series. All the belt conveyors will be of 1600 mm wide, 2300 tph. (nominal) capacity. One of the streams will be working and the other standby. Conveyor Q1 will discharge coal in TH2 and conveyor P1 will discharge coal on conveyor M2 in the new CHP. In this way coal from south west inpit can be transferred to the existing CHP through TH2 and proposed CHP. A two way chute with a motorized flap gate will be provided at the discharge pulley of Q1 so that it can discharge coal in TH2 or on short conveyor which in turn discharge on R1 conveyor after its extension.

7.3.2 Coal Handling Plant (Fig. 7.1, 7.2)

Facilities provided in coal handling plant in the sanctioned PR of 25 mty. Will remain unchanged. Same are detailed out in paragraph no. 11.4.2. Facilities consist of overhead surge bunker 10,000 te. Capacity 2 nos. silos each of 4000 t. capacity, stacker-cum-reclaimer arrangement. Lay out of CHP was laid on the ground and discussions were held with the area officers. It was decided to shift the position of overhead surge bunker 10,000 t. capacity approximately 200 m towards the north. As a result there are certain modifications in belt conveyor layout with respect to sanctioned provisions. These modifications are as under :-

- i) Conveyors M1 and M2 will receive coal from inpit belt conveyors and discharge on to tripper conveyors M3 and M4 installed over the overhead bunker of capacity 10 000t.
- ii) Conveyors M5 & M6 will receive coal from under the OH Bunker and discharge into the Silo No. 3 or on conveyors M7 and M8. These conveyors will in turn discharge coal in silo No.4 . The other conveyors will remain unchanged.

7.3.3 Mini CHPs for upper seam coals :- (Ref. Fig. 7.3) Four numbers of mini CHPs (two for north Eastern side and two for south western side) will be constructed at suitable location on surface for handling the production from upper Kasmunda seam, E and F seams brought to surface through flanks. Each mini CHP will consist of a truck receiving station (details as given at para 7.3.1 (ii) above), 1200 mm wide elevating belt conveyor, conveyor with reversible drive, overhead steel hopper (4 x 100 t. capacity), vibratory feeders below the hoppers, other equipment, civil and structural works etc. The conveyor (E1/E4) from below the hoppers will elevate coal and discharge on a spreader belt conveyor (E5/E8) provided over the 4 x 100 t. capacity steel hopper. The spreader conveyor will have

reversible drive so that coal can be discharged at drive as well as at tail end. Vibratory feeders of 200 tph. Capacity will be provided below the hopper to reclaim coal from the hopper and load in the trucks for dispatch to local consumers or for sending to main CHP.

7.3.4 Weighment: The following facilities will be provided for weighment of coal:-

- i) Coal dispatches to NTPC through silos – By in motion electronic weighbridges (Existing).
- ii) Coal dispatches by public rail wagons loaded under silos – By in motion electronic weighbridges (to be provided).
- iii) Coal dispatches through wharf wall siding – By in motion weighbridges (Existing).
- iv) Despatches to washery through belt conveyors – Belt weighing machine, weigh bridges (to be provided).
- v) Coal depatches by trucks will be weighed on 50 t. / 100t. capacity road weigh bridges (to be provided)
- vi) Coal received from coal faces will be weighed on 50 t. weigh bridges provided near the truck receiving stations (to be provided).

7.3.5 Feeder breakers :- Additional three numbers will be provided to meet the crushing needs of the mine during intermediate period till the surface mines are deployed for extraction of entire coal.

7.4.0 Manpower:-

The manpower required for operation and maintenance of inpit conveyor system, CHP are shown at Appendix – B.

7.5.0 Capital requirement :-

7.5.1 The estimated capital requirement in approved PR 25 (mty.), for PR 35 mty. And additional provision in the expansion PR (25-35 mty) are given in enclosed Annexures – A.3.5, A.3.5.L, A.3.5.2, A.3.5.3 & A.3.5.4

7.5.2 Reasons for difference in capital requirement are due to the following

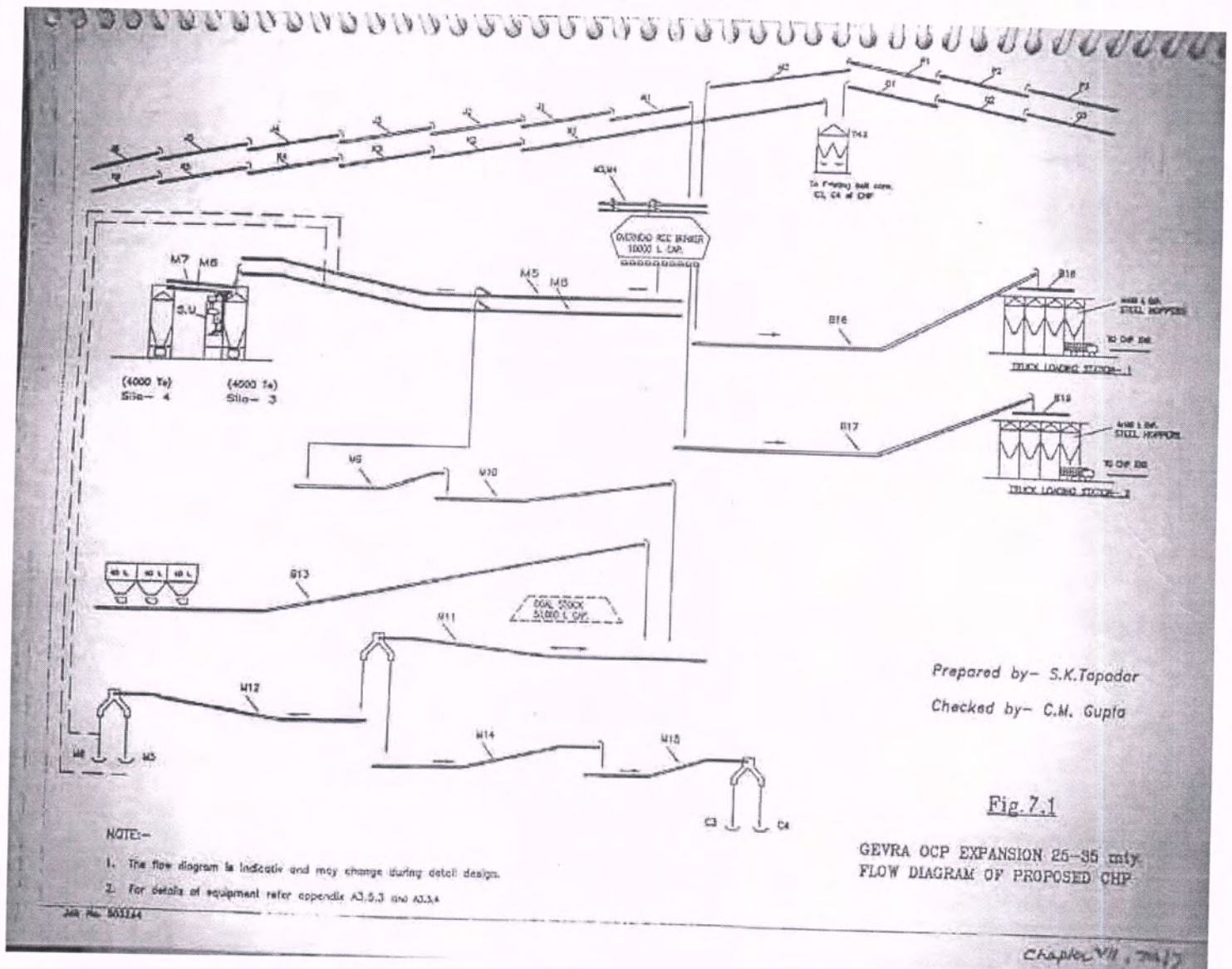
- i) Provision of 8 nos. of truck receiving station to receive Coal from trucks and feeding to out by conveyors
- ii) Provision of 3 numbers of feeder breakers alongwith associated Electrical, civil and structures

PR FOR GEVRA OCP EXPN.
(25-35 Mty)

- iii) Provision of weighbridges as per CIL guide lines
- iv) Provision of truck receiving station conveyor D9 for receiving coal to 'R' stream
- v) Provision of additional truck loading station in CHP
- vi) Provision of additional diesel Loco
- vii) Provision of additional wheel dozer
- viii) Provision of additional three numbers of mini CHPs on surface for handling coal from flanks
- ix) Provision of additional in motion weigh bridges
- x) Provision of air blasters in the RCC bunker
- xi) Due to change in system, specification of equipment Etc.

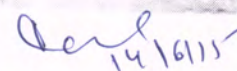

General Manager
गेवरा क्षेत्र
Gevra Area

14/6/15



14/6/15

महाप्रबंधक
General Manager
गेवरा क्षेत्र
Gevra Area



CHAPTER-VIII

RAILWAY SIDING

8.1.0 INTRODUCTION

The nearest railway station from where rakes will be supplied to this project is Gevra road Railway station. The Gevra road railway station is serving the needs of Kusmunda OCP, Gevra OCP and Dipka OCP. In order to meet the demand of rail despatches from these projects doubling of rail line between Korba and Gevra road railway station was completed by Indian Railways. Doubling of rail line between Gevra road Railway station and Gevra OCP (Junadih) is under construction. A single line between Gevra OCP and Dipka OCP has already been commissioned. ST-CLI coal washaries are loading coal at Dipka OCP in the rake of wagons by means of pay loaders at ST-CLI wharf wall siding. ST-CLI is contemplating to load coal in the rake of wagons under a silo (to be constructed by them) by means of rapid loading system.

8.2.0 EXISTING LINKAGES :-

The tentative linkage of the Kusmunda OCP, Gevra OCP and Dipka OCP on long term basis (as worked out by SECL) is as given below

i) Kusmunda OCP (15Mty)	
- Belt conveyor system to CSEB West bank power plant	- 6.1 Mty
- By rail to CSEB, east bank power plant	- 2.5 Mty
- To distant consumers by rail (MPEB, NTPC- Ramagundam, Cement plants, Sponge iron plants etc.)	- 6.4 Mty
Total	15.0 Mty
ii) Gevra OCP (35Mty)	
- Super thermal power station NTPC, Korba	- 12.75 Mty
- Balco, Korba	- 4.15 Mty
- Local washaries, to be despatched through rail	- 11.60 Mty
- Distant power stations through rail to be despatched by SECL (RSEB etc.)	- 6.50 Mty

iii) Dipka OCP (25Mty)

- Super Thermal power station, NTPC at Seepath	-	15.0 Mty
- ST-CLI coal washary which will dispatch coal by rail-		6.25 Mty
- Local washary to be despatched by rail/road (MSEB, Bhilai TPS)	-	3.40 Mty
- HECBIPL Washary	-	0.35 Mty
Total	-	25.00 Mty

The total despatches through rail from these mines will be approximately 32.00 Mty. In order to dispatch the amount of coal through rail wagons the rail line between Gevra OCP and Gevra road Railway lines needs to be doubled very quickly.

8.3.0 Existing arrangement at Gevra OCP

Railway siding at Dipka OCP is in operation. The existing siding at Gevra OCP consists of 4 numbers of wharf wall loading platforms suitable for loading of 58 Box N wagons. Out of the four wharf wall sidings three numbers have been leased to coal washarys for loading of washed coal.

Two numbers of silos each of 4000 t capacity were provided in the expansion report (25Mty) for loading of rail wagons at 5500 tph rate. Some modifications are required in the siding and the same were proposed in the expansion report.

8.4.0 Requirements in the expansion report (25 to 35 Mty)

In order to establish rake loading facility below the silos some modifications are required in the existing siding, wharf wall loading platform, additional line on load side, shifting of the existing in motion weigh bridges etc for which capital has been provided. After the commissioning of the silos, two numbers of the existing wharf walls at Junadih siding will be discontinued.

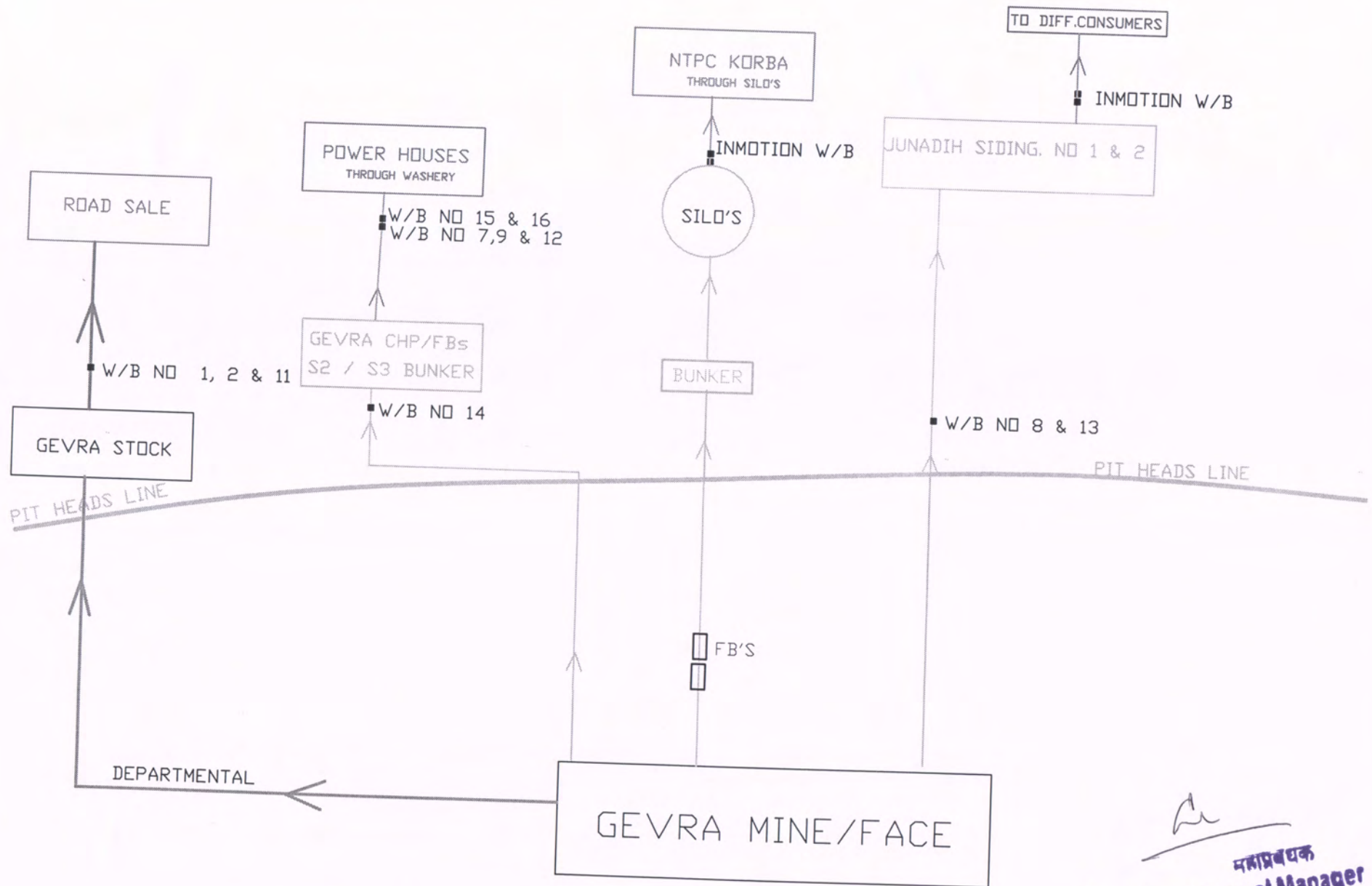
The existing wharf wall siding at the Gevra road railway station will continue to operate for loading of rail wagons.

8.4.5 Capital Requirement:

The capital requirement alongwith the details are shown in the appendix A.5.

SECL, GEVRA PROJECT

COAL FLOW DIAGRAM



14/6/11
General Manager
Gevra Area