WATER USE AND CONTROL

MMK-A PLANT

HAVERHILL, OHIO

Water Use Overview

The major use of process water at the steel mill is cooling water makeup for loss from evaporation. Evaporation accounts for approximately 95% of water use in the steel mill. The balance of water use is for boiler water makeup, process rinse waters for operations in the Finishing Mill, and blow down from the contact cooling water system. These waters will be used to quench and cool slag and for dust control from the processing of slag. This arrangement is shown on Drawing No. AU-030 –WT01.

The Ohio River will be the major source of makeup water. The location of the river water intake station, makeup water line, and the Process Water Pond are shown on the Site Utility Plan, Drawing No.C-2. The Ohio River make-up water will be augmented with the collection and use of site storm waters as another source of makeup water. A description of the storm water collection system is provided in a following section.

Treated process waters from plant operations will come from blow down of contact cooling water systems and the discharge of treated water from the neutralization plant in the Finishing Mill. These treated waters will be utilized in the Slag Processing Plant which is to be built within the steel mill. The plant design is to reuse all treated process waters in the Slag Processing Plant at steady state operation of the steel making, steel producing, finishing mill, and slag processing facilities.

Effluent from the contact cooling water systems is minimized by tight control and segregation of contact cooling water systems, the in-process treatment of contact cooling water, and a high rate of recirculation of contact cooling water. Some of the makeup for contact cooling water systems will be the blowdown from the non-contact cooling systems. A description of the contact cooling water system is provided in the following section of this report.

The generation of process water from the finishing mill is minimized by the regeneration of process acids and acid rinse waters from the acid pickling lines and scrubbers for the acid pickling lines into fresh acid. The neutralization plant treats alkaline rinse water from the pickling/galvanizing line (PGL) and acid rinse waters to produce a neutral effluent. A description of the process water treatment system is provided in a following section of this report and the drawing entitled Finishing Mill Complex-Block Diagram, 070-030-WT14.

Treated process waters are discharged either directly to the Slag Processing Plant Pond or to the Process Water Surge Pond. The Process Water Surge Pond will provide makeup water for slag processing or for discharge of treated process waters to the plant outfall to the Ohio River. Based on the plant design, under steady state conditions of all plant facilities, the Slag Processing Plant will consume all of this water. There will not be any discharge of treated process water to the Ohio River. The Process Water Surge Pond will

also serve as a retention basin to temporarily hold water for slag processing or for further treatment, if necessary, should an upset occur.

Potable Water and Sanitary Sewage

Potable water will be provided by the City of Portsmouth municipal water system via an existing water main. Sanitary sewage will be discharged through a force main connection to the Scioto County sewage treatment system. The consumption of potable water and the discharge of sewage process are anticipated to be 30,000 gallons per day. The locations of the hookups to the existing public water main and force sewer main are shown on the Site Utility Plan. These are separate and isolated systems. Permits and approvals will be obtained from the City of Portsmouth and Scioto County in accordance with their respective requirements.

Contact Cooling Water Treatment

Contact cooling water is used in the continuous caster and in the hot mill. Contact cooling water is also used for condenser cooling in the vacuum oxygen degassing (VOD) system. Contact cooling water from these systems are collected in segregated lines, treated in process, and recycled.

Contact cooling water from the VOD condensers is filtered in the VOD condenser cooling water filters and recycled back to the Caster/Hot Mill contact cooling water tower.

Contact cooling water from the caster and hot mill cooling systems is collected in the caster flume and the hot mill flume. The flumes direct water flow into concrete interceptor pits for the caster and the hot mill. Water from these pits is pumped to concrete scale pits, which are rectangular primary clarifiers, where large particles settle and oil is skimmed off the surface.

The treatment for Caster and Hot Mill cooling water systems is similar. Water is pumped to a Scale Pit. Recovered oils are retrieved by an oil reclamation subcontractor. Solids are clammed out of the concrete scale pit with an overhead crane. Solids are placed on a concrete pad adjacent to the scale pits which is sloped for drainage of water back into the scale pits. The dried solids are hauled to a DRI/Mill Scale Silo for use in the onsite DRI facility.

From the caster and hot mill scale pits water is pumped to inline sand filters. A bank of sand filters is dedicated to each system. Filtered water is recycled back to the Caster/Hot Mill contact cooling towers and cold wells, which are concrete basins located directly underneath each tower. A small amount of this filtered water is removed from the system as blow down.

The inline sand filters are backwashed with water from the contact cooling water cold well. Backwash water is treated in a roughing clarifier and a polishing clarifier. Underflow from both clarifiers is dewatered in a filter press. Clarified and filtered waters are recycled back to the hot mill interceptor pit. Dewatered solids (iron oxide) are recycled back into iron production at the DRI facility. Reclaimed oil will be retrieved by an oil reclamation subcontractor.

Blow down from the contact cooling water will go to either the Slag Process Pond or the Process Water Surge Pond. Based on process design, all of this blowdown will be used in the Slag Processing facility during steady state production of the entire facility.

Process Waters

Spent pickle liquor and pickle rinse water are conveyed to the Acid Regeneration plant (ARP) where both are recovered and converted back into hydrochloric acid to be reused in the finishing operations. One hundred percent (100%) of the acid used for pickling and eighty (80%) of acidic rinse waters from the pickling/galvanizing (PGL) and push pull pickling (PPL) lines and scrubbers are converted to regenerated acid in the ARP plant.

The remaining acidic rinse water is used in the neutralization plant for neutralizing alkaline waters from the alkaline cleaning and rinse sections of the PGL line. These process waters are neutralized, oxidized and a flocculent is added to agglomerate the small particles generated for removal of soluble metals. Sedimentation occurs in plate clarifiers and the underflow is transferred to a thickener and dewatered in a chamber filter press. Filter cake is shipped off-site for disposal.

The clarified waters are given a final polishing filtration in a sand filter bank. The pH of the polished waters is adjusted as necessary. Treated process water is then pumped to either the Slag Processing Pond or the Process Water Surge Pond.

Based on process design, at full production of all plant facilities it is anticipated that 100% of treated process waters will be used in slag processing.

Storm Water Collection and Control

A description of the Storm Water Collection System can be found in Site Grading and Drainage Plan Drawings (DWG NOsC-3 and C-3-1 through C-3-9) and the Hydrologic Study and Report.

All process operations and raw material handling systems are in buildings and under roof and are not exposed to storm water. The exception is Slag Processing and Scrap Handling which is discussed elsewhere in this report. Liquids, such as oil and acids, will be stored inside or within secondary containment if stored outside. Storm water collected within such containment structures will be pumped to the Neutralization Plant or a scale pit for treatment.

The Main Storm Water Pond is located west of the processing area in the southeast corner of the plant. This Storm Water Pond collects drainage from a 128 acre area. The locations of the catch basins and storm water lines which drain to this basin are shown in the Site Grading and Drainage Plan C-3, C-3-7, and C-3-8.

Storm water drainage is collected from grassy areas, the plant road, and plant roofs on the west side of the Processing building. Storm water collected in this pond will be used for cooling water makeup.

This storm water basin has an outlet to the adjoining Process Water Makeup Pond. The Storm Water Pond will be used to minimize makeup water from the Ohio River. The

Storm Water Pond will drain into the Process Water Makeup Pond. A tele-metering system will cut back on process water intake from the Ohio River as storm water supply becomes sufficient.

If needed, the Storm Water Pond will overflow through a storm sewer line to grassy area north of the Process Water Surge Pond. The location of the storm sewer line and storm water outfall is shown on the Site Grading and Drainage Plan (DWGs.C-3,C-3-7,C-3-5, and C-3-3. The Storm Water Pond is not expected to overflow under normal rainfall conditions.

The Scrap Yard on the east side of Gallia Pike will be used for the storage of pre-qualified scrap for the steel mill. Rainfall in this area will be collected in an underground drainage system and pumped to the Hot Mill Clarifier/Scale Pit. The scrap yard will have a surface of crushed slag and will be underlain with a geo-textile synthetic liner. Water will be collected in perforated PVC pipe on top of the liner. The piping will drain to a collection sump and from there will be pumped to the Hot Mill Clarifier/Scale Pit (See DWG. C-3-D3)..

The Slag Processing Plant north of the Scrap Yard will be operated by a contractor. Storm water in the Slag Processing area will be collected in the slag dump station which is used for solidification and cooling of slag from the Melt Shop. Runoff from this area is collected in the Slag Processing Pond, which serves as the source of quench water for slag processing. A berm will surround the slag processing area to prevent stormwater from leaving the site.

The Barge Dock facility is a concrete slab which drains to the adjacent storm water basin. The location of this basin is shown on Dwg.C-3-3. This basin will overflow to a grassy area north of the storm water basin.

A storm water basin north of the plant substation will collect storm water drainage from the north central portion of the plant. Overflow from this basin enters a grassy area west of the storm water basin. The location of this basin is shown on Dwg.C-3-1.

Storm water runoff from the east side of the processing building is collected in a series of catch basins that drain to a drainage ditch along the railroad tracks on the east side of the property. The locations of the catch basins and storm water lines are shown on the Site Grading and Drainage Plan. Storm water drainage from this area is from the Processing Building roof, grassy areas, and two parking lots. The drainage ditch drains to a cove in the northeast corner of the property.

A Storm Water Pollution Prevention Plan (SWP3) will be developed in accordance with NPDES Permit requirements.