WATER RESOURCE QUALITY

Water contamination

Sources of Impact

In RTNMC Assay laboratory, volumetric analysis is conducted by titration and instrumental analysis using Atomic Absorption Spectrometer in its daily operation. The primary wastes generated by the laboratory include liquid wastes from the chemical and instrumental studies. Typically, wastes are acidic and developed at an average rate of about 50 to 60 liters per day with an average pH of 2.2.

Therefore, measures are undertaken to eliminate the negative impact of these wastes on the environment. All liquid wastes from the analyses are directed to a waste tank (capacity = 12 m3). Neutralization is done so that the pH range of the liquid waste is maintained between 6 and 9. Regular pH monitoring of the wastewater inside the tank is conducted. If, at any instance, the pH is lower than 6, lime is introduced to raise the pH; on the other hand, if it goes up to more than 9, a sulfuric acid solution is introduced to lower the pH.

Sewerage/septic tanks for domestic wastes within the industrial plant and townsite area were installed to prevent contamination of the water resources and surface environment. The septic tank's effluent within the townsite goes to the treatment facilities located in Areas A and C before being discharged to the natural drainage. In the industrial plant, the septic tank's effluent goes to the siltation ponds considering that the volume is relatively much smaller than townsite.

Leachate from landfills may contaminate land and water resources. Presently, the leachate from the existing landfill is allowed to drain into the Tagpisa Siltation Pond, where dilution occurs, and any suspended solids, if any, are allowed to settle in the pond.

Product waste generated is used oils and, if not properly collected, shall also contaminate water resources and waterways. When accumulated and not correctly disposed of, wastes can get their way to contaminate water bodies.

The production of beneficiated nickel is sun-drying, dry screening, and crushing; thus, it does not employ process water, posing any threat. However, petrochemical spills such as fuels and lubricants may occur, causing isolated water and land contamination.

The existing mine operations do not apply any toxic chemicals that procreate poisonous substances such as tailings or acid drainage. Consequently, the only chance for contaminating the groundwater resources is from the unwanted spill of petrochemicals, oil and lubricants generated from maintaining the equipment used in the mining operation and discharge from sustaining the Assay Laboratory and waste disposals.

The leaching of potentially harmful heavy metals is also a notable concern that needs to be addressed besides the siltation of important waterways.

To mitigate and control the possible leaching of heavy metals, RTNMC employs and researches several Leaching Control Measures

Mitigating Measures:

Therefore, measures are undertaken to eliminate the negative impact of these wastes on the environment. All liquid wastes from the analyses are directed to a waste tank (capacity = 12 m3). Neutralization is done so that the pH range of the liquid waste is maintained between 6 and 9. Regular pH monitoring of the wastewater inside the tank is conducted. If, at any instance, the pH is lower than 6, lime is introduced to raise the pH; on the other hand, if it goes up to more than 9, a sulfuric acid solution is introduced to lower the pH.

In the primary drainage discharge at the Preventive Maintenance Services (PMS) wash bay, the wastewater mixed with oil and grease is let flow to the oil-water separators before the oil-free water is discharged to the drainage canals leading to the siltation ponds. The oil-water separator operates simply by the concept of difference in specific gravity. In a water-oil mixture, water being heavier separates, forming the lower layer while the oil floats over the water. The oil layer is decanted and stored in drums while the water flows through the drain pipe towards the drainage canal. The wash rack is with three (3) units of oil-water separators (OWS) and, overall, ten (10) units of oil-water separators spread out to areas where oil is to be discharged.

Used oil from the OWS is regularly collected and put in drums to store in a 20 m x 20 m restricted Temporary Hazardous Waste Storage facility while awaiting disposal to interested buyers along with the product wastes generated such as busted fluorescent lamps, used lead-acid batteries, Polychlorinated Biphenyls from an old power plant, among others. If not properly collected, these wastes shall also contaminate water resources and waterways. The product wastes are appropriately segregated and stacked in a crate for proper air ventilation. The concrete flooring is slightly slanted and provided with a gutter. The lowest point of the flooring is provided with one unit of a water-oil separator. Spilled oils are washed by rains and flow towards the separator unit.

Moreover, proper engineering design of waterways is likewise practiced, such as:

- Installation of charcoal gabions at the discharge point of Lower Togpon and Lower Kinurong Siltation Ponds was done to contain possible percolation of heavy metals in the area.
- Certain species of vetiver grass are placed at strategic locations to test the capacity of the plants to absorb heavy metals.

- A regulated amount of Ferrous Sulfate (FeSO4) is dosed at the inlets of central siltation ponds during the rainy season. This chemical compound reduces Hexavalent Chromium (Cr+6) level to the non-harmful Trivalent Chromium (Cr+3).
- The design of the significant siltation ponds is a countermeasure to the occurrence of heavy metals: the series of siltation ponds ensure that any volume of water carrying heavy metals is detained long enough and its velocity decreased to provide heavy metal precipitation.
- Regular desilting is conducted to ensure that all heavy metal precipitates are removed from the silt ponds and will not have a chance to re-oxidize into harmful aqueous cations.

The office in the plant site is equipped with septic tanks and sewerage systems that are regularly maintained to prevent contamination of adjacent water bodies. Meanwhile, the septic tank's effluent within the townsite goes to the treatment facilities located strategically before being discharged to the natural drainage. This is done by having the sewage water pass through the primary screening of a series of boxes containing charcoal then to the newly constructed secondary treatment facility that can accommodate 2000 cu.m. of discharge water per day.

Leachate from landfills may contaminate water resources. Presently, the leachate from the existing landfill is allowed to drain into the Tagpisa Siltation Pond, where dilution takes place and any suspended solids, if any, are allowed to settle in the pond.

Solid domestic wastes from townsites and industrial areas are appropriately disposed of. The Organization maintains that solid wastes are managed in an environmentally sound manner per the RA 9003. It emphasizes waste reduction thru recycling, reducing, refusing/rejecting and reusing programs. A No to Plastic Policy was implemented and continuously monitored to ensure that the employees and the whole RTNMC community adhere to the Policy. A Materials Recovery/Drop-Off Facility was established in RTNMC Town Site and received varied recoverable materials from the community. Disposable materials and used parts like metal shavings, used equipment parts, etc., are stored in designated scrap metal pile areas for eventual sale to scrap buyers. A Bioreactor was also established to process biodegradable wastes and convert them into fertilizer.

Meanwhile, the Company will also explore the possibility of processing PET bottles into reusable items. These efforts are geared toward minimizing wastes dumped to the Sanitary Landfill Facility located at GP-28 and co-operated with CBNC and LGU Rio Tuba. In this manner, it will extend the capacity and service life of the landfill.