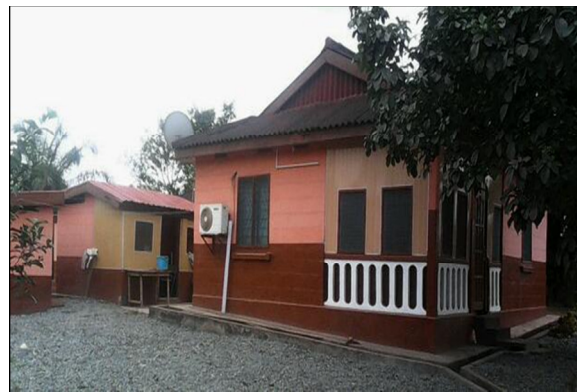


7.0 INFRASTRUCTURE IMPROVEMENTS – 2014

7.1 Nsuta Infrastructure

During the year under review, several infrastructural projects were undertaken. Four black-man bungalows were completely renovated for junior staffs leading hands. Each bungalow has its own toilet, bath and kitchen. The toilet has been modified into biofil. Wooden windows have been changed into louvers. The bathrooms have been tiled and the toilets and kitchens have been provided with sinks. Paintings of the buildings (internal and external) have been well done. The project was contracted to FAMPAQ. See plates 34 and 35 for the black-man bungalows renovated for junior staffs leading hands.



Plates 34 and 35: Showing Black-man bungalows renovated for Junior staffs leading hands

7.2 The Nsuta Hospital

The roof of the main and Senior Staff wards were changed and interior and exterior paintings were done. Windows and doors were changed to sliding, and burglar proofs were also fixed to the windows and doors to prevent thieves from entering. The rooms have been divided into four and each room has its own toilet and bath. Televisions and fridges have also been placed in each room of the Senior Staff wards.

In the Isolation ward only the roof and the mosquito net around the block were changed. The roof was changed in the Pharmacy and the swing doors were also repaired. Wooden shelves were similarly erected at the pharmacy store for storage of medicines.

The roof of the x – ray block was changed. Some changes were also made internally on plumbing and paintings. An additional air conditioner was fixed since the resident medical officer has in mind to use the x – ray block as a temporary theatre, due to the major renovation works the main theatre will undergo.

At the Out Patient Department (O. P. D), the roof was changed. The initial dwarf wall was continued up to roof level. Ceiling was provided, floor was tiled, sliding doors and windows were fixed and burglar proofs were also fixed behind the doors and windows to prevent thieves. Air conditioners were moreover fixed there. 20 pieces of three-in-one metal chairs were likewise put in place for out-patients. Both exterior and interior were painted. The Branch Union also provided a 32" flat screen television and multi television decoder at the O. P. D. Extension works were done at the injection and dressing rooms, but part of the extension was added to the laboratory, the waiting room for scrutinizing and a toilet for patients who are to give their urine and stool. The injection room and lab were also upgraded. All the renovation works were contracted to K. Kansco Enterprise, except the shelves at the Pharmacy. See plates 36 and 37, showing the refurbished OPD and Lab extension respectively.



Plate 36: Shows the Refurbished OPD



Plate 37: Shows Lab and OPD extension

7.3 New Office

In 2014 the company built a new administration complex. The new office project involves the construction and operation of a one storey building serving as the main Administration Block and other (single block) for Personnel, H/R, Public Relations and Pay Offices. These were completed and inhabited in 2014. The projects were contracted to Taysec Construction. See plates 38 and 39 underneath for the new Administration Blocks (New Office).



Plates 38 and 39: Showing the New Administration Blocks (New Office)

7.4 Junior Staff Residences

Block F comprises sixteen (16) sub blocks with a total of sixty-four (64) rooms. It has thirty-two kitchens, and a toilet and bath room has been provided to each of the thirty-two (32) occupants. This project was contracted to Track Vision Company. Initially the kitchens were compound type and the toilets and bath houses were also in a public use type. The buildings have been enclosed for each occupant to have his/her privacy. The already wooden windows were changed into louvers. Both exterior and interior paintings were done on each building. All toilets and baths were tiled, and kitchens provided with sinks. See plates 40 and 41, showing renovated and completed Junior Staff housing units.



Plate 40: Renovated Junior Staff houses



Plate 41: Completed Junior Staff housing units

7.5 Liquid Waste Dump

A liquid waste dump/septic tank have been excavated at Pit A, near the refuse dump. The size of it is 15m² and the depth is 10m. The Estate Officer in collaboration with the Environmental Co-ordinator deemed it best for the company to have its own liquid waste dumping site when the custodians of the Tarkwa Nsuaem Municipal Assembly liquid waste dumping site ceased the latter from using the place. For almost two months we had to close some of our toilets since they were full and had no dump site.

We had to wait until the ban was lifted before we could syphon our toilets. Management therefore approved the suggestion for the company to have its own site, thus the commencement and progression of septic tank. K KANSCO Company Limited is the contractor undertaking this project and is being closely monitored by the Estate Officer and the Environmental Co-ordinator.

7.6 Warehouse Development

In the year 2014, the warehouse was rehabilitated by Dutch & Co. It was done to prevent excessive dust on the floor, provision of new office at the top, reduction of effects of heat and extra heavy racks and shelves for storage of spare parts. Below are the developments which took place at the warehouse:

1. Epoxy coating for warehouse floor;
2. Extra wall from floor to roof (including side walls to roof);
3. Second floor extension from office to side walls including moving the stairs and extra railing;
4. Complete illumination plan;
5. Extra heavy racks and shelves (including good area);
6. Extra racks and shelves (fast movers/second floor area);
7. Shelf dividers and plastic stackable bins;
8. Clothing lockers;
9. Complete ceiling to reduce the effects of excessive heat.

See below in plates 42 and 43, the hitherto and current state of the warehouse correspondingly.



Plate 42: Shows old interior outlook of the warehouse

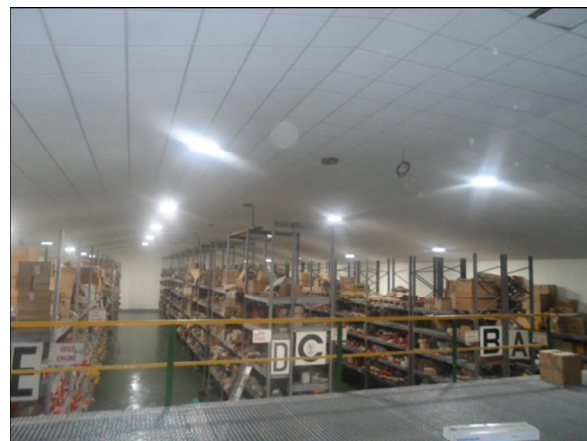


Plate 43: Shows new interior outlook

7.7 Exclusive Marketing Forum

The Exclusive Marketing forum was organised by the Service Providers and Mining Companies under the auspices of the Ghana Chamber of Mines at Goldfields Ghana Limited, Tarkwa. The platform offered both parties the opportunity to discuss a variety of issues with reference to the Mining Companies' requirements for quality products and services and challenges faced by the Suppliers. GMC was represented by staff of the Commercial, Environmental and the EME/LV department at an Exhibition which took place on 12th November, 2014 at the Goldfields Ghana Limited.

The forum allowed for direct interaction between Members of the Affiliates Committee of the Ghana Chamber of Mines and Senior Executives and Technical managers of member mining companies.

This one-day event limited participation to Chamber's affiliate members only. It was the second event in the innovative series organized by the Affiliates Committee of the Ghana Chamber of Mines aimed at encouraging partnerships between local businesses and the Mining Industry. See plate 44 showing Atlas Copco stand, and plate 45, Knight Piesold stand.



Plate 44: Shows Atlas Copco Stand



Plate 45: Shows Knight Piesold Stand

This initiative had as its theme: *Ensuring a sustainable win-win relationship between Service Providers and Mining Companies*. Following a successful maiden Exclusive Marketing Forum in 2012, this second Exclusive Marketing was structured to build on previous successes and allow for direct interaction between members of the Affiliates Committee of the Ghana Chamber of Mines and Senior Executives and Technical Managers of member mining companies. These included Heads of Departments, Supply Chain and Procurement Managers, Engineering, Mining and Processing Managers.

7.7.1 The Exhibiting Companies

AEL, Atlas Copco, ATS, DHL, Golder Associates, Greenline Logistics, Grundfos Pumps, Inesfly, Interplast, Kaltire, Knight Piesold, Maxam, Nexans Kable metals,. Panafrican Mining, Process & Plant and Liebherr Mining Ghana.

7.7.2 Participating Mining Companies

Anglogold Ashanti, Asanko Gold, Ghana Manganese Company Ltd, Goldfields Ghana Ltd, Golden Star Resources, Kinross Chirano, Newmont Ghana and Perseus Mining.

7.8 Civil Projects Undertaken in 2014

7.8.1 Weighbridge

In 2014 the company intended to construct a weighbridge to weigh truck hauling bulk manganese to the Takoradi Port in different trucks. The main objective is to check the gross weight of the vehicle on the road to ensure safety of the vehicle against the public and other road users.

7.8.2 Light duty washing bay

For efficient and sustainable use of water, the heavy duty washing bay was expanded in 2014 at the cost of US\$ 20,000 to cater for light duty vehicles washing as well. Unlike the heavy duty washing bay where water is recycled and used for washing, the existing facility has no integrated system for recycling. The project increased the capacity of the silt trap from 30m³ to 40m³ and also enables de-silting to be done easier and quicker by use of Komatsu WA500 front end loader. The heavy duty washing bay will help in effective utilization of the oil water/separation and can accommodate three vehicles at a time with a ramp for washing underside of vehicles. Other civil works are as follows:

- Silt trap: The structure was built at the end of the main drain where water from various activities and areas leaves the mine.
- Speed Ramp: The ramps were built to check speed on the roads and reduce accidents which will go a long way to increase safety on the roads for both pedestrians and vehicles.
- Road surfacing: The existing roads were resurfaced with bitumen seal to increase the lifespan of the roads on the mine.

See below plates 46 and 47 for the new light duty washing bay.



Plates 46 and 47: Showing Light duty washing bay completed for commissioning

7.8.3 Champion Oil filling station

In 2014 a new filling station was constructed by Champion Oil to replace the existing station near the mechanical workshop. The following were the reasons for this construction:

1. The sloppy nature of the existing fuel delivery point posing safety hazard to delivery trucks;
2. The increasing company's production level as well as fleet of equipment/vehicles which the existing fuel filling station could no longer cope;
3. The closeness of the old filling station to the workshops also poses safety hazard to the mine.

In view of these, Management thought as much to relocate the existing fuel station.

Bidding was done amongst Total Petroleum, Zen Petroleum and Champion Oil of which Champion Oil won and constructed a new and modern fuel farm for the mine's operations.

Three (3) logi tanks are installed and each has maximum capacity of 70,550 litres. Because of the hot nature of the Nsuta environment, the fuel can expand at a point so a space was left on top after calibrating making the capacity to be 69,000.

Loading and offloading bay was designed connected to Oil/Water separation system with a capacity of 13,500 litres which is assumed to be the biggest compartment in a bulk truck. Ramps are built to prevent oil spill into the external environment and also to control the speed of vehicles. The Pump House has three (3) pumps. One (1) light dispenser with an inbuilt pump; for discharging fuel into light vehicles, the other two pumps are used one at a time for dispensing fuel into GMC bowsers and also used for dispensing fuel from bulk tankers into farm logitanks . Each pump can dispense approximately 600 litres of diesel per minute for both loading and offloading. See plates 48, 49, 50 and 51 below showing the 3 logi tank installations, loading and offloading bay, GMC and Champion Oil staff and Champion Oil engineers inducting GMC managers respectively.



Plate 48: Shows 3 logi tank installations



Plate 49: Shows loading and offloading bay



Plate 50: Shows GMC and Champion staff during commissioning of the facility



Plate 51: Showing Champion Oil engineers inducting GMC managers during commissioning

8.0 ENVIRONMENTAL IMPROVEMENT PROGRAMMES DURING YEAR 2014

During the year under review, the following Environmental Improvement Programmes were carried out:

- The mine face was visited daily to ensure compliance with Minerals Commission and EPA regulations regarding pits and waste dumps. Pit dewatering pumps were also inspected to ensure that there were no oil leakages entering the external water body;
- The various workshops were regularly inspected and closely monitored to ensure good housekeeping;
- Various drains on the mine including “Essuabena”, Kawere and Tarkwa Bansa were regularly de-silted to improve drainage and surroundings regularly weeded to maintain a clean environment;

- Cracked bund walls around the used oil storage area were demolished and reconstructed to forestall oil spill into nearby water bodies in case of any eventuality.
- The oil/water separator, silt traps and siltation ponds on the mine were regularly desilted in order to reduce the amount of silt carried by storm water into the Kawere stream;
- The tailings dam toe drain was desilted and area cleared of weed to allow efficient flow of water;
- Oil contaminated soil at the volatilization pad was turned fortnightly to speed up the breakdown of oil;
- There was an investigation to ascertain the cause of exceedance in some of the mine's water quality parameters. Various mitigation measures such as regular desilting of the Kawere stream and improvements in the storm drainage systems have been commenced. As part of measures to improve the TSS value of the Golf course analytical results, eight (8) people from Akyem were contracted for six months to desilt the Kawere stream;
- To protect windrows and benches against erosion which could result in bench failure, pueraria seeds were broadcasted to serve as a vegetative cover;
- There was careful pruning of trees and bushes both on the mine and the residential areas. This was done to improve their aesthetic value, clear visibility for drivers, as well as avoid breaking/falling overgrown branches onto electrical wires in particular.

8.1 Environmental Programmes and Workshops

The following Environmental Programs and workshops were carried out during the year under review:

- Induction of newly employed personnel, employees resuming from annual leave including top and middle level management and third party contractors was carried out on a regular basis;
- The Environmental Policy and Standard Operating Procedures for management of environmental issues such as hydrocarbon management, waste management, noise and dust were presented, since this involve all stakeholders in pertinent environmental issues so as to achieve the company's environmental goals;
- The usual daily HSE morning meetings continued during the year to ensure consciousness of workers on safety and health issues whiles on the job;
- Management has instituted an Internal Auditing Team to ensure compliance with EPA Akoben Criteria and Minerals Commission Regulations (L.I. 2182) 2012;
- GMC was represented by the environmental department in the Chamber's Environmental and Social Committee (ENSOC) meetings throughout the year;
- Internal audits of the various workshops and all areas of environmental and safety interests were conducted during the year under review. The respective departments

responsible were rated; the best being green and the worst red. General improvement upon the previous month's performance was observed;

- The Environmental Coordinator made a presentation on effective dust suppression on mines at the University of Mines and Technology (UMAT) on 18th of October on behalf of the Ghana Chamber of Mines;
- As part of efforts made to put in mitigation measures to exceedances in some water quality parameters of the company's monitoring points, officials from SGS laboratory were invited to corroborate the sampling method used by the department;
- As part of the processes to issue water permit, Water Resources Commission Personnel visited the mine for the verification of the water use application submitted to the Commission;
- As part of measures to improve our current Akoben result, a meeting was held between the Mining and Environmental Departments to identify areas of concern for improvement;
- Education on the importance of waste segregation and colour codes has been intensified at the various departments. Dust bins depicting the appropriate colours have been placed at vantage points. The environmental department has pasted pictures of various wastes on the bins.

The Ghana-India Kofi Annan Centre of Excellence in ICT (AITI-KACE) in collaboration with the Ghana Chamber of Mines organized a three (3) weeks QGIS course in Accra for Geological survey and Environmental Professionals in the Mining Industry. This was dully participated by the Environmental Coordinator. The training is aimed at preparing individuals and the organizations with practical understanding of the key concepts, principles, processes and functions that enables successful IT service and to enable members to share GIS Resources, learn and understand the concepts and utilize the components of QGIS. The training programme gave participants the opportunity to benefit from hands – on training, examination advice and guidance certified mock examinations and supplementary handouts. Plate 52 below is a picture of participants for the workshop.



Plate 52: Shows Geologists, Surveyors and Environmental Professionals in the Mining Industry

8.2 Summary of Environmental Activities during Year 2014

- The oil/water separator was thoroughly cleaned; the four (4) siltation chambers connected to the oil/water separator were de-silted and regularly checked to ensure only water free of oil was discharged into surrounding streams.
- Various drains on the mine were regularly de-silted to improve drainage and surroundings regularly weeded to maintain a clean environment.
- Apart from regular desilting of various silt traps, siltation ponds and drains on the mine in order to reduce the amount of silt carried by storm water into the Kawere stream, general desilting and cleaning of the heavy duty washing bay and siltation ponds attached to the oil/water separator commenced.
- Oil storage areas including the filling station, the used oil store were also inspected. Cleanliness of area, absence of flammable materials, properly piled oil drums and general security of the area were monitored.
- A contract was awarded to Knight Piesold to prepare a Mine Reclamation and Closure Plan for GMC;

- A report on whether the reclamation site shows signs or conditions for the return of fauna and flora and baseline report on the types of terrestrial and aquatic species on GMC concession was carried out during the year ;
- Data for soil analysis conducted at the CSIR-Kumasi was received;
- Judicious pruning of tree branches was also carried out at residential areas to avoid accidents from broken off branches as well as improve their aesthetic values;
- Two flower beds, each at the sides of the Security Control Post 28 check point were prepared and hedges planted in for beautification purposes;
- Vettiver grass grown along the slope of the tailings dam to prevent erosion was brushed and weeds smothering the vettiver uprooted;
- Two pits (septic tank and soak away) which have been excavated at Hill A opposite the refuse dump area awaiting Civil construction to serve as final disposal site for sewage generated in response to the TNMA prohibition of the existing disposal site is ongoing;
- The tailings dam toe drain was desilted and area cleared of weed to allow efficient flow of water;
- Oil contaminated soil at the volatilization pad was turned fortnightly to speed up the breakdown of oil;
- Broken/damaged dustbins were replaced by new ones and others placed at other vantage points. In all, sixteen (16) dustbins were distributed to improve housekeeping within the mine;
- As part of measures to improve the TSS value of the Golf course analytical results, eight (8) people from Akyem were contracted to desilt the Kawere stream;
- The mine face was visited daily to ensure compliance with Minerals Commission and EPA regulations regarding pits and waste dumps. Pit dewatering pumps were also inspected to ensure that there are no oil leakages entering the external water body;
- Oil storage area was also inspected. Cleanliness of area, absence of flammable materials, properly piled oil drums and general security of the area were monitored;
- Various places like “ofram” and teak plantations, berms along the road between Pit C Central and the mine office, the palm plantation at Pit B and the carbox stockpile reclaimed site were weeded;
- Various drains on the mine including “Essuabena”, Kawere and Tarkwa Banso were desilted to improve drainage and to maintain a clean environment;
- The contaminated soil containers at the workshops were repainted black in accordance with GMC colour code;
- Various measures such as cutting of trench, planting of more trees and filling of gulleys with waste rocks were carried out on benches to ensure stability;
- Overgrown branches of trees in the residential areas, hospital and on the mine were pruned to improve their aesthetic value;

- The water storage chambers of the oil/water separator used for washing dump trucks were de-silted and thoroughly cleaned. The regular de-silting and cleaning of the separating chambers also continued within the year to ensure that only oil-free water is released into the external environment;
- Four (4) other siltation ponds/traps are being constructed to improve the efficiency of preventing/reducing siltation of the Kawere stream.

8.3 Visiting Groups

- The inspectorate Division of the Minerals Commission visited the mine as part of its monthly inspection schedules;
- The Environmental Protection Agency also visited the new fuel farm to assess its compliance to Environmental and Safety standards;
- From the 6th to 8th of October, 2014, the Mine Safety Audit team from the Minerals Commission visited the mine for the annual audit;
- As part of the processes to issue water permit, Water Resources Commission Personnel visited the mine for the verification of the water use application submitted to the Commission;
- As part of efforts made to put in mitigation measures to exceedances in some water quality parameters of the company's monitoring points, officials from SGS laboratory were invited to corroborate the sampling method used by the department;
- Students from the University of Mines and Technology embarked on several field trips to the mine to familiarize themselves with drilling methods notably changes from the RC Drilling to DD Drilling;
- Four (4) officers of the Minerals Commission visited the mine site to discuss the localization plan of the company. Mine familiarization tour was undertaken after the discussions;
- Nineteen (19) surveyors from the Ghana Institute of Surveyors paid a familiarization visit to the mine on the 21st of the month of November. They toured the mine to acquaint themselves with the mining processes of Ghana Manganese Company Limited.

12.0 CONCLUSION

GMC will continue to pursue policies, strategies and targets which will enhance environmental management in accordance with the Environmental Assessment Regulations 1999 (LI 1652).

The establishment, equipping and expansion of the environmental department is a sure indication that the company is obliged and motivated to ensure that all activities of the mine conform to the commitments made in the EMP throughout the life of mine (LOM). This commitment forms an integral part of GMC's Environmental Management System (EMS) and is subject to annual budget and management accounting systems of the operations.

The company will continue to allocate adequate resources available every year to ensure implementation of reclamation of decommissioned waste dumps and mined-out areas and at the same time ensures the smooth running of its mining operation.

The Community Assistance policy will be reviewed annually to assess the impact on recipient communities and with the view to improving their standard of living. In addition, management of GMC will ensure that its operations do not endanger the environment but rather maintain its obligations in respect of sustaining the environment.