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D'APPOLONIA
ECMG

REPORT OF THE

**EXTERNAL COMPLIANCE
MONITORING GROUP (ECMG)**

**SECOND SITE VISIT
JULY 2007**

*Ahafo Mining Project, Ghana
Ahafo South Area*

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SUBJECT: SECOND VISIT OF THE D'APPOLONIA ECMG TO THE AHAFO MINING PROJECT, GHANA, JULY 2007

Introduction and Executive Summary

1. This report summarizes observations made during the second field visit (July 23 - 27, 2007) by D'Appolonia S.p.A., Italy (D'Appolonia), serving as the External/Independent Environmental, Health and Safety (EHS) Compliance Monitoring Consultant (referred to as the External Compliance Monitoring Group – ECMG) for the Ahafo South Mining Project, Ghana (“the Project”).
2. This External Compliance Report is broken down into three key subject areas, as follows:
 - Compliance with International Finance Corporation (IFC) Policies and Guidelines
 - Compliance with the Environmental and Social Impact Assessment (ESIA) documentation
 - Recommendations for Improvement based on D'Appolonia experience

ECMG observations that require action and will be reviewed in subsequent assessments have been collated in Table 1 – Follow-up Issues. Table 1 will be updated by ECMG following each site assessment. The ECMG also provided recommendations for improvement based on the collective experience and expertise of the team members. These recommendations are not considered compliance requirements and there is no onus on the operation for implementation. ECMG, however, encourages the Project to consider the usefulness of the recommendations and incorporate them, as appropriate, into management activities.

3. Newmont Ghana Gold Ltd. (NGGL), a wholly owned Ghanaian subsidiary of Newmont Gold Corporation (Newmont), is developing gold reserves with mining and milling operations located along a mineralized zone that extends approximately 70 kilometers (km) in the Brong Ahafo Region of central Ghana, West Africa. The Project is the construction of a greenfield open cast gold mine and associated facilities at current (January 2007) estimated capital cost of US\$588 million. Construction initiated in April 2004 and mining started in January 2006 with the pouring of the first gold pour in July 2006. Current operations have an expected mine-life of more than 20 years.

Mining is currently conducted in two areas, the Subika and Apensu pits. A third pit, Awonsu, is included in the Ahafo South Mining Project, but it is still to be opened. Approximately 1,340 NGGL staff is working on site and 1,570 contractor staff.

4. In January 2006, the IFC approved financial assistance in the form of a loan to NGGL to continue development of the Project, approximately the southern half of the overall Ahafo mineralized zone. NGGL committed to apply the IFC Social and Environmental Safeguard Policies and Guidelines (as applicable in 2006) to the design, construction, operation, and closure of the Project.

IFC involvement and financing require both pre-finance project due diligence and post-finance project assurance related to the various social, environmental, and health and safety IFC Safeguard Policies relevant to the Project, as presented in the ESIA, which was disclosed on August 29, 2005. NGGL has committed to external/independent social, environmental, and health and safety compliance monitoring to provide an additional level of transparency to the implementation of social, environmental and health & safety management programs¹. Social compliance is independently evaluated and reported by other external assessors² outside of the D'Appolonia ECMG organization.

5. D'Appolonia's scope of work is to conduct semiannual visits to the Project in order to:
 - Identify areas and degrees of compliance or non-compliance with IFC Policies and Guidelines:
 - IFC Operational Policy OP 4.01 Environmental Assessment
 - IFC Operational Policy OP 4.04 Natural Habitats
 - IFC Draft Policy on Safety of Dams OP 4.37
 - the World Bank Operational Policy Note 11.03 Management of Cultural Property
 - World Bank Pollution Prevention & Abatement Handbook (PPAH) General Environmental Guidelines; the World Bank Environmental, Health and Safety Guidelines for Mining and Milling - Open Pit
 - IFC Hazardous Materials Management Guidelines
 - IFC Occupational Health and Safety Guidelines;
 - Provide practical guidance and advice to Project's field teams; and
 - Identify specific Environmental, Health and Safety (EHS) issues and conduct follow-up and closure of issues.

The Focus Areas of the EHS reviews are the following:

- EHS Management performance;
- EHS compliance (vs. Ghanaian and International standards as presented in ESIA);
- Compliance with IFC EHS Safeguard Policies;
- Facility review;
- Biodiversity Management Plan performance;

¹ The General Terms of Reference for the external/independent social, environmental, and health and safety compliance monitoring are publicly available at <http://www.newmont.com/en/operations/projectpipeline/ahafo/docs/supdoc.asp>

² Mr. Frédéric Giovannetti and Ms. Tasneem Salam. The reports of their reviews are publicly available at www.newmont.com and www.ifc.org.

- Implementation of the Environmental and Occupational Health and Safety (OHS) Action Plans (as presented in ESIA); and
- Hazardous Material and Transportation Management.

D'Appolonia had not reviewed the associated facilities (i.e., the Volta River Authority's Kumasi-Sunyani Transmission Line) as it was understood that it was not included in their scope of work. The review of this component may be included as part of future ECMG site visits.

6. Specific activities conducted during this mission included:

- Evaluation of implementation of the commitments contained within the Environmental Action Plan (EAP) of the ESIA. Items addressed in the EAP include: air quality; surface and ground water resources; soil resources; natural resources (flora and fauna, including aquatic organisms) and wetlands; noise and vibrations at off-site receptors; waste management; and cultural resources.
- Evaluation of implementation of the commitments contained within the OHS Action Plan (OHSAP). Items addressed in the OHSAP include:
 - hazardous materials and transportation management, including cyanide;
 - occupational H&S monitoring, including noise and vibrations,
 - OHS statistics; and
 - bilharzias, malaria and HIV/AIDS programs;
- Evaluation of compliance with IFC Policies and Guidelines, as above;
- Visit to the sites of the Project facilities (including the Apensu and Subika Pits; Water Storage Facility; Tailings Storage Facility; the Processing Plant; and associated infrastructure);
- Meeting with the Project teams responsible for EHS compliance monitoring and review relevant plans, procedures and monitoring records;
- Conducting a closeout meeting with NGGL EHS and management personnel focusing on key findings, correction of any factual inaccuracies and possible corrective/upgrade actions.

7. The closeout meeting was conducted at the Ahafo Gold Mine on July 27, 2007 and the information presented in this meeting has formed the basis for this report. The information, observations, and opinions presented in this report are those of D'Appolonia and are independent of those of NGGL and the IFC.

8. The Ahafo South Project is in operation and its facilities appear to be designed, operated and maintained according to good industry practice. Although evaluation of design, construction and operations aspects is not part of the ECMG scope of work, the organization was found to competently operate the site, which is well maintained and equipped with good facilities, campsites, workshops, equipment and machinery.

The most fundamental observation made from the second visit is that construction and operations continue to be at a more advanced stage than the EHS Plans and Procedures, which are often still in draft version, although both the environmental and HSLP organizations are working to finalize their procedural framework. The current environmental and HSLP management structure is consistent with ESIA commitments and the key managerial positions are filled. Substantial improvement was noted with respect to the Project's ability to react to emergency situations, although training is still considered incomplete and the emergency response planning documents should still be strengthened.

From an environmental standpoint, NGGL is generally working towards achieving acceptable environmental and natural resource management programs. Ambient air is being monitored, as well as workplace noise. Surface water and groundwater monitoring is continuing, but may need to be expanded based on the preliminary results of groundwater modelling that indicate that dewatering from the open pits may possibly impact community wells and local wetlands. An infiltration and ARD kinetic testing program has been undertaken and the results to date indicate that ARD should not be a significant long-term environmental issue. The concentration of cyanide in the Tailing Storage Facility (TSF) decant pond continues to be below 50 ppm Weak Acid Dissociable (WAD) cyanide guideline, but the influent is persistently higher than this limit, on average 80 ppm WAD cyanide. NGGL is in the process of constructing a tailings wash facility that is expected to reduce the cyanide concentration of the influent to the TSF below 50 ppm WAD cyanide. The TSF is operated as a “zero discharge” facility.

Topsoil appears to be adequately recovered in the mining area, and a comprehensive soil survey is currently ongoing in association with the University of Ghana to complement the ESIA data. These data will be important in defining what procedures are most suitable for the long-term management of the large quantity of topsoil that is being stockpiled. A thorough and well-designed approach to natural resources management in the Project vicinity has been developed and continues to be implemented. The Biodiversity Management Program is still to be fully defined and implemented, but it is understood that the finalization of this Plan will need to be based on results and observations from the work that is ongoing.

EHS auditing is being inconsistently implemented, especially with respect to contractors and subcontractors, and corrective actions should be expedited. Substantial effort should still be implemented to meet appropriate standards for waste management. Noise and vibrations from blasting is being monitored under the requirements of the Social Action Plan, and found to be within Project and IFC standards. A deficiency with ongoing activities is that NGGL has not yet undertaken archaeological surveys as part of their Cultural Resource Management (CRM) program.

The Tailing Storage Facility (TSF) appears to be competently designed and is being constructed within the established design criteria. Reviews of the tailings dam design provided by an independent reviewer for NGGL demonstrate that the probability of the failure of the tailings dam is very low, given its design, but do not provide details on the basis of the hazard classification of the facility. An Emergency Action Plan still needs to be prepared for this facility.

Table 1
Follow-up Issues

Mission/ Issue No.	IFC Policy / ESIA Compliance	Opening Date	Closing Date	Description	Status	Comments
M1.1	IFC	Dec 06		Although it is acknowledged that, according to the Ghanaian EPA environmental permit (EPA/EIA/143), NGGL is required to finalize and submit an Environmental Management Plan within 18 months after commencement of operations (January 2006), NGGL should finalize all EHS related plans and procedures as soon as practical.	Pending	The final EMP was submitted to the Ghanaian EPA for comment in mid-April 2007 and was re-submitted in July 2007, but no comments have been received by NGGL. An additional situation is that NGGL is in the process of converting from its 5-Star EHS program to compliance with ISO 14001 and OHSAS 18001 by the end of 2009. One of the consequences is that a limited number of current plans and procedures have been modified since the last ECMG mission, although an action plan is in place to have the Management System procedures completed by the end of September 2007 in time for an external auditor gap analysis of the new management system.
M1.2	IFC	Dec 06		Incorporate the contents of the applicable IFC Guidelines into the plans and procedures under finalization. The applicable and relevant IFC Guidelines are presented in Section 1 of the ESIA.	Pending	This has not been undertaken for the reasons described above. IFC parameters are being used in the field as the standards to be achieved, but the plans and procedures have not been finalized to reflect these standards.
M1.3	ESIA	Dec 06		Monitoring and assessment of compliance with ESIA commitments is an important part of the Project. A specific procedure should be developed and implemented as soon as practical, including the monitoring of contractors and subcontractors involved during Project development. It is recommended that levels of non-compliance be clearly defined based on potential or actual threat, damage or irreversible impact to a sensitive or important resource. An EHS non-compliance register should be maintained by the Environmental and HSLP Departments.	Pending	NGGL is maintaining an incident register, but this is not the same as an EHS compliance register, where non-compliant conditions are defined in anticipation of a corrective action.

Mission/ Issue No.	IFC Policy / ESIA Compliance	Opening Date	Closing Date	Description	Status	Comments
M1.4	IFC	Dec 06	July 07	Ensure that periodic workplace air quality monitoring is undertaken, meeting relevant IFC requirements (World Bank Environment, Health and Safety Guidelines Mining and Milling - Open Pit, August 1995), is in place.	Pending	Workplace ambient air quality measurements have been made. However, data show calibration problems. The item will be closed if calibration problems are corrected or clarified through appropriate quality control.
M1.5	ESIA	Dec 06		Develop a mitigation plan for the community water resources or else provide additional sustainable sources of potable water to the affected communities. Develop a comprehensive monitoring plan applicable to mine dewatering activities. Develop a mitigation plan for potential impacts to wetlands caused by the dewatering.	Pending	The description has been slightly modified from the original M1.5 to reflect the results of preliminary groundwater modeling that indicates that drawdown from dewatering the pits could have the potential to impact community water supplies and local wetlands. Further modeling and studies are needed and it is anticipated that this situation may require the development of a plan to mitigate this impact and the development of a comprehensive monitoring program.
M1.6	IFC	Dec 06		The Ghana Project Sediment Control Manual applies to all NGGL activities in Ghana, and therefore it should be used as a technical base to document current sediment control practices and develop the Ahafo Erosion and Sediment Control Plan. The plan should be site-specific, comprehensively discuss all measures applicable to the site, present their location and features in tools such as maps, identify maintenance, monitoring and reporting actions, and define responsibilities within the NGGL departments. The plan is required by the IFC and should be developed as soon as practical.	Closed	This Plan has been prepared and made site-specific to the Ahafo project.

Mission/ Issue No.	IFC Policy / ESIA Compliance	Opening Date	Closing Date	Description	Status	Comments
M1.7	IFC	Dec 06		Develop the Closure and Reclamation Plan per the EPA requirements and deadline, and ensure that it is updated up on a three yearly basis and that IFC requirements are included. (World Bank Environment, Health and Safety Guidelines Mining and Milling - Open Pit, August 1995). This is an important compliance tool that should be detailed, and available to ensure successful and consistent closure and reclamation activities. Species selected for revegetation, topsoil management, revegetation cover objectives (e.g., percent of cover to be obtained in a set period), revegetation aftercare, monitoring, and maintenance protocols and methods are important aspects to be addressed in detail in the Closure and Reclamation Plan. Ensure that revegetation and monitoring are based on quantitative and/or replicable techniques and are well documented, indicating the amount of obtained cover, actions conducted, used fertilizers and other soil conditioning techniques.	Closed	A final Reclamation Plan has been prepared and submitted to the Ghanaian EPA, but as of yet no comments have been received. This document does include the requirements of the draft IFC Guidelines for precious metal mining. It should be noted that there are some QA/QC aspects of this report that still require revision. It was presented to the ECMG as a final report, but the header and footer of the report still indicate that it is a draft document and the footer information is that it is a 2005 document, not January 2007.
M1.8	ESIA	Dec 06		Ensure that the committed noxious weed monitoring and control plan includes alien invasive plant species and ensure that any revegetation activities conducted as part of site reclamation are carried out with native species and non-invasive species relevant to the identified final land use. Develop the plan as soon as practical, taking into account that reclamation activities are already ongoing.	Pending	Reclamation activities have started in the sense that a topsoil management program has started in anticipation of the reclamation that will eventually take place and there has also been some minor greening/beautification of areas on the mine lease. Invasive species are beginning to appear where topsoil has been removed and on topsoil stockpiles. The Reclamation Plan does not address what will be done should invasive species/noxious weeds be encountered, but notes that “the weed <i>Chromolaena odorata</i> [an invasive species] also dominates much of the landscape.”

Mission/ Issue No.	IFC Policy / ESIA Compliance	Opening Date	Closing Date	Description	Status	Comments
M1.9	IFC	Dec 06	July 07	Conduct formal EHS audits of the off-site waste disposal facilities and waste management contractor practices for sewage sludge, food scraps and recyclable waste.	Closed	<p>EHS audits have been completed by NGGL at the Kumasi Landfill: Although it is recognized that the facility is relatively well designed and probably represents the only landfill available in the area, significant problems in the management of the facility were observed during the ECMG visit. The issue is closed, but new action items have been opened on waste management to address the findings of this visit.</p> <p>An EHS audit was also completed at the Presank workshop, the Contractor in charge for the management of hazardous waste. The site was found well managed and properly operated.</p>
M1.10	ESIA	Dec 06		Finalize the site-specific Waste Management Procedure/Plan.	Pending	Although it is understood that waste management practices are not dependent on the finalization of the Waste Management Procedure/Plan, the actual procedures being followed are not fully compliant with IFC standards and the document should be finalized with procedures that are compliant with IFC standards.
M1.11	ESIA	Dec 06		Conduct stack emissions testing at the existing on-site incineration facility.	Closed	The use of the on site incinerator has been discontinued. If a decision is made to reactivate this unit, stack emissions monitoring will be required.
M1.12	IFC	Dec 06		Expedite the finalization of all plans and procedures related to the management of hazardous materials.	Pending	Documentation is reported to be nearing completion and good practice with respect to the handling of hazardous materials was observed in the field.

Mission/ Issue No.	IFC Policy / ESIA Compliance	Opening Date	Closing Date	Description	Status	Comments
M1.13	IFC	Dec 06		Expedite the implementation of the recommendations identified in the research and risk assessment of Ghana road transportation and periodically review the risk assessment based on current transport conditions. Ensure that hazardous materials transport monitoring and control inside and outside the Project boundaries are adequately conducted and recorded in a specific register.	Pending	Cyanide transport follows a transportation plan developed by the cyanide transporter While it is expected that the transportation of cyanide follows this procedure, the findings of ICMC Operations Audit indicated that the issue of cyanide transportation is “pending” a code audit of the cyanide transported as advised by the supplier (Orica). Shell was able to demonstrate during this audit that good practice is being followed for their transportation of fuels.
M1.14	IFC	Dec 06		Expedite the finalization all plans and procedures related to cyanide, as they are critical documents needed to be followed during the current operations phase.	Pending	Operational procedures are in place based on the results of the ICMC Operations Audit, but the Cyanide Management Plan still needs to be finalized. In the field, cyanide was observed to be correctly managed.

Mission/ Issue No.	IFC Policy / ESIA Compliance	Opening Date	Closing Date	Description	Status	Comments
M1.15	IFC	Dec 06		Prepare a site-specific ERP that can serve as a complete guide to emergency management, from a risk assessment to identify vulnerabilities to detailed procedures to respond to a full range of situations, ranging from small spills to natural disasters. Include maps to identify access and escape routes, muster points, as well as the risk "hot spots" and sensitive receptors where particular care is required to manage emergency situations.	Pending	Some improvements have been made to the Emergency Response Plan, but it is still not a document consistent with "best practice". In particular, the document is weak with respect to hazard identification and does not define the extent of possible hazards or provide response scenario maps. Consequently, the procedures given in the ERP are in most cases general, not related to specific site/operation hazards and do not provide precise information to both the ERT and site personnel. Other specific deficiencies include: <ul style="list-style-type: none"> - Actions in case of liquid fuel fires are not provided; - The responsibilities and roles in case of emergency are not clear; - Emergency exits and Evacuation Assembly Points are not clearly defined; - Flash flood areas in case of severe weather or natural disasters are not identified on maps.
M1.16	IFC	Dec 06	Jul 07	Conduct noise surveys of the various workplaces and verify that the PPE assigned to the workers is appropriate for their noise environment	Closed	NGGL has procured equipment and has started workplace monitoring. Appropriate PPE was observed.

Mission/ Issue No.	IFC Policy / ESIA Compliance	Opening Date	Closing Date	Description	Status	Comments
M1.17	IFC	Dec 06		Verify that Project activities do not adversely impact the local communities from the standpoint of noise and vibrations that could originate from Project activities other than those associated with blasting, such as from Project-related vehicular traffic. Ensure that compliance with applicable and relevant standards is monitored	Pending	Blast monitoring/vibration is a subject that is essentially an ongoing situation as long as mining activities continue. NGGL is able to demonstrate that conservative standards have been adopted and that community monitoring is taking place. Nevertheless, there are many community complaints such that NGGL has formed a joint blast committee with local communities and brought in an external research institute to evaluate the situation. It is understood that there is no obvious relationship between blasting and building cracking, but some claims may be valid. Although it is likely that noise measurements show compliance with applicable standards, it is not practical to distinguish project-related noise from background noise or noise from other sources based on the data presented.
M1.18	IFC	Dec 06		Include archaeology reconnaissance survey within the scope of the cultural resource management surveys that should be undertaken as part of environmental baseline surveying.	Pending	Archaeological reconnaissance surveys are still not being conducted. This is inconsistent with OPN 11.03 where the policy of preserving cultural resources is defined and where cultural resources are defined to include archaeological sites. It is understood that an archaeological program will be established and planned for Q4 2007.
M1.19	IFC	Dec 06		Prepare an Emergency Action Plan (or Emergency Preparedness Plan) for the potential failure of the TSF that clearly defines potentially affected areas based on potential release scenarios as determined on the basis of a risk assessment and contains notifications and chain-of-command procedures. Environmentally sensitive areas and receptors should also be identified on the maps of areas with potential impact.	Pending	IFC Operational Policy 4.37 has a requirement for the preparation of Emergency Preparedness Plans. This Plan still needs to be prepared. The text of the description of this issue has been modified from the September 2006 ECMG report to reflect that the consequences of all potential TSF failures, such as could be associated with situations not involving catastrophic failure, should be addressed as appropriate.

Mission/ Issue No.	IFC Policy / ESIA Compliance	Opening Date	Closing Date	Description	Status	Comments
M2.1	IFC	July 07		The multi-taxa biodiversity monitoring program should be developed and made available.	New	It is strongly recommended to expedite the process.
M2.2	IFC	July 07		Discontinue the use of the Kumasi facility unless associated with capacity building or facility improvements.	New	The landfill is no longer being used for the disposal of non-hazardous solid waste, but is still being used for the disposal of sewage sludge and possibly other wastes, like oily rags. The Kumasi Landfill is non-compliant with IFC standards for waste disposal.
M2.3	IFC	July 07		On-site trench disposal of non-inert waste (putrescible waste) is not best practice and lacks leachate management in compliance with WB standards. Re-evaluate this option and consider compliant alternatives, such as the development of a dedicated landfill with an appropriate leachate collection system, composting, maceration and disposal through STPs, or some other compliant solution. In addition, NGGL has not properly tracked their hazardous waste stream and needs to amend their register to accurately reflect quantities of waste generated and their ultimate disposal processes.	New	It is recognized that the problem with the disposal of food waste is not a flaw of NGGL's policy, but caused by a failure of the incinerator system to handle the high moisture content of the putrescible waste stream. Nevertheless, it is necessary to point out that the current solution involving on-site trench disposal of non-inert waste (putrescible waste) is non-compliant due to the lack of leachate management. The Pollution Prevention and Abatement Handbook indicates that leachate from solid waste disposal sites should be sampled and tested monthly, using strategically located sampling points. The problem with the waste register is that it indicates that hazardous waste is being disposed at the Kumasi facility, which is reported not to be taking place. The waste register needs to accurately reflect actual final disposal.
M2.4	IFC	July 07		Ensure that the standards used for workplace noise are at least as conservative as those adopted in the IFC Occupational Health and Safety Guideline	New	Workplace noise monitoring is ongoing, but NGGL should ensure that results are compliant with applicable IFC guidelines.

Mission/ Issue No.	IFC Policy / ESIA Compliance	Opening Date	Closing Date	Description	Status	Comments
M2.5	ESIA	July 07		Conduct (and update) a complete risk assessment (i.e., not limited to potential impacts to wildlife) to evaluate all processes associated with the construction and operations of the TSF to all environmental and human receptors	New	NGGL is committed to conduct a site-specific risk assessment to determine the level of risk posed by the design and operation of the Ahafo South Project. Risk assessment should be updated annually. The only formal risk assessment which appears to have been conducted is relevant to potential impacts to wildlife.

1 EHS Management

1.1 Plans and Procedures

Project Strategy:

NGGL EHS and social commitments are contained in the disclosed documents: ESIA, the Resettlement Action Plan (RAP) and the Public Consultation and Disclosure Plan (PCDP).

The Environmental and Social Action Plan (ESAP), presented in Section 5 of the ESIA (available at www.newmontghana.com), is an integral component of Ahafo South Mining Project's overall planning, design, budget, and implementation. It identifies the Project management programs and specific mitigation measures expected to reduce potentially adverse impacts to acceptable levels. The ESAP includes a requirement for environmental monitoring to verify the effectiveness of mitigation during all phases of the Project. The ESAP also specifies institutional responsibilities, an implementation schedule, and cost estimates. The Plan provides for modifications over time if information shows that changes should be implemented. An ESAP update was published in April 2006.

NGGL has committed to achieving the highest standard of performance in areas of Community and External Relations, Environmental Stewardship, and Health, Safety and Loss Prevention (HSLP) through responsible management of activities throughout various stages of the Project.

At the time of the December 2006 audit, the Newmont Mining's Five Star Management System, a global management system developed in-house by Newmont, was being applied at Ahafo to monitor implementation of the social, environmental, and health, safety, and loss prevention action plans. This program is being phased out in anticipation of certification under ISO 14001/18001, scheduled for the end of 2009.

In addition, Newmont has committed to implement the International Cyanide Management Code (ICMC), a voluntary industry program for companies involved in the manufacture and transport of cyanide and the production of gold. The ICMC covers the lifecycle of cyanide management and defines a series of principles and objectives that cover production of cyanide, transportation, handling and storage, operations, decommissioning of facilities, worker safety, emergency response, training and communications with the public.

Observations:

At the time of the December 2006 audit, the Five Star System at Ahafo was in its initial development and implementation stage. At that time, five Integrated Management System Procedures were approved by senior management and 14 were in draft form. Following a Corporate commitment that all Newmont Operations will be certified to ISO 14001 for Environmental Management and OHSAS 18001 for Health and Safety Management in early 2007, a gap analysis of all site procedures was underway to ensure they meet the requirements of these International Standards

in addition to the Corporate Five Star standards for ESR and a new set of corporate standards for HSLP.

There are still 19 Integrated Management System procedures and of this group five are final, with the gap analysis on an additional five completed and with the management team for comment and approval. All management system procedures are scheduled for completion by the end of October 2007. An external Gap Analysis of the site Integrated Management System was scheduled for October for ISO 14001 and November for OHSAS 18001. Of the 57 associated Standard Operating Procedures (SOPs), 12 still remain to be finalized including topics such as Record Management and Emergency Control Management. The approved Incident Reporting procedure is under revision.

A general comment to the manuals and procedures that are considered final is that the document control procedures should be strengthened. Documents indicated to be in use to the ECMG, such as the Reclamation Plan, are provided without indication of an approval process or indication of revision. The Ahafo Sediment Control Manual does not have a date of issuance.

All of 15 HSLP procedures (i.e., Occupational Health and Hygiene, Hazardous Materials, Surface Ground Control, Surface Fire Prevention, Energy Isolation, Mobile Equipment, Electrical Safety, Work Permit Systems, Machine Guarding and Conveyors, Explosives, Light Vehicles and Road Safety, Working at Heights, Pressurized Systems, Cranes and Lifting Equipment, and Medical Programs) are still in draft form. Of the 22 associated SOPs, the same nine are finalized as previously encountered in December 2006. All of nine Environmental Management System Procedures (i.e., Hydrocarbon, Chemical, Cyanide, Tailing, Waste Rock, Waste, Water, Air Quality, Closure and Reclamation Planning) are still in draft form.

Because most of the plans and procedures have not been modified since the December 2006 audit, the issue of incorporation of the applicable IFC guidelines remains the same as previously reported. Specific information and training on these guidelines and Project commitments do not appear to be consistently provided to the staffs of both departments.

NGGL is working towards ensuring that Ahafo operations are in compliance with the ICMC, as discussed in Section 2.7. The ICMC Operations Audit conducted in June 2007 indicates NGGL to be in "substantial compliance" with the ICMC. Deficiencies were documented in terms of the lack of a specific ICMC audit of the contractor Barbex for the transportation of cyanide, which at the time of the ECMG audit was currently planned for, and because WAD cyanide at spigots exceeds 50 ppm limit approximately 65% of time, with an average level of 80 ppm WAD cyanide.

Some EHS management tools, including non-compliance and change management registers, are still not found to be available to the staff. NGGL has indicated their belief that non-compliances are captured in the Accident and Incident reporting process, but this is only partially correct. A non-compliance register should encompass situations that could develop into incidents, as well as the actual incidents themselves. For example, if an NGGL auditor found that waste oil was not being properly contained and managed by a subcontractor, but the oil had not yet spilled, the situation would represent a non-compliance requiring a corrective action, but it would not be reported as an incident.

An environmental incident register was available that included the list of all spills reported on site relevant to different substances, and the relevant amounts of contaminated soil cleaned. Since the December 2006 ECMG visit, eighteen spills have been recorded and classified according to a scale of severity levels from 1 (least significant), to 5 (most significant): fifteen level 1 incidents and three level 2 incidents, two associated with oil spillage and one associated with spillage of processing slurry. The register was found to be reasonably detailed and the incident closure status now appears to be consistently reported.

Change Management is one of the NGGL Management System Procedures for the Ahafo Project. A positive component of the Management of Change (MOC) Procedure is that there are requirements for consideration of environmental, social and health and safety factors within each change and there are requirements for both workforce and community communications when the change has the potential to affect people. Detriments to this process are that the criteria for defining the degree of change are not well established. Also, there are no requirements for Lender notification or approval for changes that represent major changes to a NGGL commitment. As an example, the changing of a pump in the processing plant might represent a low-level MOC process that should be an independent decision made by NGGL, whereas the change to a commitment made for effluent standards, adding a new tailings facility, or adding some other major infrastructure, could represent major change that should be associated with notification or approval by the Lenders. The MOC Procedure has requirements for follow-up, but it was not apparent that the changes are being maintained in a register such that the environmental, social and H&S staff can continue to track those changes within their ranges of responsibility.

In general, the environmental documentation, information and data were found to be easily retrieved by the staff. Monthly environmental reports are submitted to the Ghana Environmental Protection Agency (EPA) in accordance with the EPA Act 490. An environmental permit register is in place.

IFC Policy Action Items

- M1.1 NGGL should finalize all EHS related plans and procedures as soon as practical.
- M1.2 Incorporate the contents of the applicable IFC Guidelines into the plans and procedures under finalization. The applicable and relevant IFC Guidelines are presented in Section 1 of the ESIA.

ESIA Action Items

- M1.3 Monitoring and assessment of compliance with ESIA commitments is an important part of the Project. A specific procedure should be developed and implemented as soon as practical, including the monitoring of contractors and subcontractors involved during Project development. It is recommended that levels of non-compliance be clearly defined based on potential or actual threat, damage or irreversible impact to a sensitive or important resource. An EHS non-compliance register should be maintained by the Environmental and HSLP Departments.

Recommendations for Improvement (updated from recommendations provided in December 2006):

- i) An MOC process is in place, but several aspects could be improved:
 - Maintain an MOC register such that the EHS staff can track the implementation and consequences of the change, as well as close-outs of the actions as appropriate,
 - Ensure that efforts are made to identify whether a proposed change has potential EHS (and social) implications,
 - Ensure that the EHS organization screens all changes; the current Procedure requires EHS review, but documentation was not provided that this procedure is actually being followed,
 - Include engineering and procedural (e.g., standards) changes as part of the process, not just physical changes,
 - Assess and document the potential impacts of the change, consistent with the ESIA process,
 - Assign a change class and define notification procedures based on the assigned class; it is recommended that major changes involve Lender notification and/or approval,
 - Ensure that the MoC process is transparent and auditable.
- ii) Develop a table comparing IFC Guidelines requirements and their means for implementation within NGGL procedures and include it in the Project documentation.
- iii) Make sure that the EHS staff has all appropriate management tools in addition to the environmental incident register (non-compliance registers, MOC registers, etc.) and ensure that they are consistently completed and maintained.
- iv) Strengthen the document control process such that the status of a document in terms of its revision status, originator, approval process, and date of issuance are consistently reported and readily identifiable on the documents.

2 Environment

2.1 Environmental Organization and Staffing

Project Strategy:

The Ahafo Environmental Department and Management Structure has essentially remained at the same level as observed during the December trip with most of the positions at management and superintendent level covered. A General Manager for Environmental and Social Responsibility (ESR), responsible for compliance with Ghanaian and corporate environmental requirements, is still in place and he is supported by each Department manager accountable for maintaining their respective areas of responsibility to comply with applicable environmental standards. The ESR General Manager reports to the Regional ESR Director, who in turn reports to the Regional Vice President. The Environmental Manager, supported by three superintendents, respectively for Compliance, Monitoring, and Reclamation, is in place and reports directly to the ESR General Manager.

Observations:

The current environmental management structure is consistent with ESIA commitments and the key managerial positions are filled. Since the December 2006 audit there has been some restructuring, but the key positions are filled.

The Environmental Department organization includes three Superintendent positions, respectively for Compliance (position filled), Monitoring (position filled) and Reclamation (to be appointed).

No changes in the Compliance team were observed with four Environmental Officers still in place and an environmental technician still to be appointed. The Monitoring team is staffed with seven Environmental Officers and one technician, with one position for laboratory monitoring yet to be filled. The Reclamation team is the most complex and numerous based on the organization chart. A Coordinator is in place, as well as two Reclamation Supervisors, who report to him. A Reclamation Officer is to be appointed, who will be in charge of short term laborers (40 people). The positions in the two teams under the two Supervisors are partially filled, with hydro-seeder operators, technicians, and "lead hands" operators. Twenty-four reclamation workers are within each team.

The environmental training is ongoing through a different department within NGGL, although the ESR Department supports it. Approximately 80 percent of the environmental staff has reportedly completed their training. It was reported that an environmental training module has been developed for the workforce, including the contractors. For example, competency training on Air/Noise Quality Management has been started for NGGL employees by the environmental department.

IFC Action Items

Nil

ESIA Action Items

Nil

Recommendations for Improvement:

- i) The Superintendent Reclamation position should be appointed as soon as practical, as mining operations are ongoing.
- ii) Training is ongoing, but it is still recommended that a training matrix should be developed focusing on environmental topics and better documenting the status of training of key positions in both NGGL and main contractor's staffs.

2.2. Air Quality*Project Strategy:*

The environmental control measures indicated by the ESIA refer to the management and mitigation of both fugitive dust emissions and gaseous emissions. Fugitive dust is associated with mine operations including blasting, ore and waste rock hauling, dumping, grading, and backfilling actions, as well as from processing plants, particularly from transfer points on conveyor systems, grinding, milling and stockpiling, and from increased vehicular traffic in the area. Gaseous emissions are

generated from operation of mine equipment, combustion sources, and vehicular exhausts.

The control measures to mitigate fugitive dusts include watering or use of other surface binding and/or wetting agents, reclamation and revegetation, vehicular speed control, road maintenance, and use of dust suppression sprays or dry dust collection systems on ore crushing circuits and transfer points at the processing plant. Gaseous emissions are mitigated through proper operation and equipment maintenance, as well as specific end-of-pipe treatments, including scrubbing of emissions from the carbon regeneration kiln at the processing plant.

The Project has committed to implement dedicated air monitoring programs for both dust and gaseous emissions control.

Observations:

In September 2006 a preliminary point and fugitive air emission sources survey was conducted by the Project to identify all point sources and non-point sources of emissions from operations to the ambient air. The baseline monitoring survey identified the main emission sources and air pollutants of concern associated with the NGGL operations at the Ahafo South and Ahafo North concessions including mining, processing plant, residential facilities, sanitary and other areas.

Two methods are reported to be employed for dust emissions monitoring: dust deposition gauges and PM₁₀ dust samplers. From the data made available to the ECMG, ten (10) permanent ambient dust monitoring points have been established: five (5) dust monitoring gauges are located within or nearby the Ahafo mine operations area (Ntotoroso Township, Rank Camp, Kenyase Town, Plant Site, and Senior Staff Village), while the other five (5) are positioned in the nearby villages (Yamfo Core Shed, Yamfo Town, Rubi Village, Adrobaa Township, and Terchere Nursery). Monthly average results for thirty (30) day sampling were provided for 2007. Dust samples are tested at an off-site accredited laboratory (SGS) for the following parameters: total solids, ash, soluble solids, insoluble solids, and combustible matter. A specific SOP for air monitoring, in draft form in December and planned to be reviewed in early 2007, is still not available.

Monitoring of ambient dust concentration includes PM₁₀ air quality measurements. Available results of samples recently collected at the Ahafo South Rank Camp and at the Senior Staff Village show values generally below the guidance limit of 70 µg/m³, assumed by WB/IFC General Environmental Guidelines as reference concentrations immediately outside the project property. Exceedances of the limit were reported in the February and March sampling. Although PM₁₀ samples should be collected on a weekly basis according to the Environmental Monitoring and Measurement Schedule for 2007, the results provided were not always in compliance with this schedule due to equipment breakdowns.

Dust suppression activities in the mining area through watering were observed to be extensive and generally well managed. Dust suppression was also reported to be undertaken at the loading points, the crushers and the conveyor discharge points as well as along some selected community and public roads.

A number of air monitoring workplaces have been established throughout the Project including mining, processing plant, residential facilities, sanitary and other areas. A

new 350 TESTO gas emissions analyzer is now in use for the measurements to integrate the CROWCON multi gas detector previously adopted. Point source emissions testing for sulfur dioxide, nitrogen oxide, and carbon monoxide have been performed and results from the July sampling were provided. Although the results provided did not show any air quality issue, the monitoring results seem to indicate some problems with the equipment calibration (i.e. concentrations below 0 are reported).

Stack emission testing, planned for first quarter 2007, has not yet started.

IFC Policy Action Items

M1.4 Ensure that periodic workplace air quality monitoring is undertaken, meeting relevant IFC requirements (World Bank Environment, Health and Safety Guidelines Mining and Milling - Open Pit, August 1995).

ESIA Action Items

Nil

Recommendations for Improvement:

- i) Complement the ongoing dust and PM₁₀ monitoring with gaseous pollutant measurements at project boundaries and locations of sensitive receptors.
- ii) Develop a dust deposition / ambient air quality / emissions monitoring data register, consistently presenting all results obtained from direct measurements and laboratory testing (repeat recommendation).
- iii) Develop an air quality and point/fugitive emissions monitoring procedure/plan, including existing sources (e.g., carbon regeneration kiln, existing non-hazardous waste incinerator if operational) and planned ones (e.g., new hazardous waste incinerator).
- iv) Ensure that locations of monitoring points are consistent with results from an updated air pollutant dispersion model including both point and fugitive emissions sources.

2.3 Surface and Groundwater Quality

Project Strategy:

The ESIA defines the need for the Project to construct a water storage facility (WSF), several environmental control dams (ECDs) designed for sediment and erosion control, some waste rock facilities, and a tailings storage facility (TSF). Aquifer characterization in the mine pits, pit-lake studies, and geochemical analyses of potential acid generating rocks have also been identified as necessary studies to be conducted. No releases of effluents containing cyanide or other chemicals to the environment will be allowed, except possibly under accidental/emergency conditions. A water/chemical solution recycle strategy is adopted by the Project.

Surface water control ditches are constructed as necessary to intercept and divert potential run-on water from flowing into mine pits, the TSF, or onto waste rock disposal facilities and ore stockpiles. These channels divert uncontaminated run-on water back into natural drainage downgradient from disturbed areas or into ECDs. Surface water control ditches have been designed and constructed to accommodate a 100-year, 24-hour precipitation event. Target release criteria for the sediment control system are 50 milligrams per liter (mg/l) total suspended solids (TSS).

As Project policy, no discharge to the environment will occur if applicable standards are not met. In particular, target release criterion for Total Suspended Solids (TSS) at the ECDs is set at 50 mg/l (World Bank Environment, Health and Safety Guidelines Mining and Milling - Open Pit, August 1995). No water discharge is allowed from the TSF.

Water quality monitoring plans include the sampling of the surface water streams in the surroundings of the mining operations, at the ECDs and any other Project water management structures. Twenty three surface water monitoring points have been selected, including locations at the ECDs and WSF. Water quality monitoring also includes the installation and periodic sampling and testing of nineteen groundwater monitoring points located upstream and downstream of the Project area, and eleven wells located in the surroundings of the TSF. The groundwater monitoring points are nested wells at two different depths: shallow (around 30 to 35 meters deep) and deep wells (around 85 to 90 meters deep). Testing includes water table elevation data and a large set of physical and chemical parameters to fully characterize water quality. Pump-back wells are planned around the TSF as an additional measure to control potential accidental impacts to groundwater.

The following table summarizes the ongoing surface and groundwater monitoring.

Table 1 – Ongoing Surface and Groundwater Monitoring

Type of Monitoring	Number of Locations/Points	Frequency per month
Surface Water -Ahafo South	23	23
Groundwater Monitoring - Ahafo South	19	19
Dewatering Wells	24	21
NGGL Potable	6	6
Community Potable Wells	20	20
TSF Piezometers	9	9
TSF wells	11	11
STP	2	60

Water from mine pit dewatering will be not discharged from the site, unless it meets water quality standards and conditional to Ghana EPA approval. Dewatering wells are anticipated for the pits and the plan is for the dewatering water to be discharged to the WSF. Potable water testing is planned for both raw water and treated water. Twenty community wells are included in the sampling plan.

Observations:

At the time of the December 2006 ECMG visit, NGGL was in the process of updating the calculation of the Tano River water balance such that the pumping requirements to maintain the WSF could be determined. To date, a total volume of 6,086,553 m³

water has been abstracted from Tano River, although it has not proved necessary to operate the Tano River abstraction point since October 2006. One of the reasons why it has not been necessary to extract water from the Tano River has been the need to dispose of water pumped from both Subika and Apensu Pits, which totaled 2,643,080 m³ by the end of the second quarter according to the Water Use Summary Report sent to the Water Resources Commission for April – June 2007.

An Acid Rock Drainage (ARD) kinetic testing program was being conducted at the time of the December 2006 ECMG visit to geochemically characterize waste rock drainage and pit-lake conditions, and to confirm the results from the static tests that indicate ARD will not adversely impact local surface and groundwater. The test results provided to the ECMG for the kinetic testing program confirm that the waste rock should not be expected to represent an ARD problem.

Six piezometers have been placed in the WSF dam (WS_1 through WS_6), and three piezometers (TFS1 through TFS3) have been located in the TSF dam. These piezometers are aimed at monitoring water level and seepage in the embankments and along the banks of the two storage facilities and confirm the normal performance of these structures. The monitoring wells in the area of the TSF and around the Ahafo South area do not suggest any adverse impact to local groundwater conditions resulting from Project activities.

Exceedances of the WHO guidelines continue to be consistently detected for calcium and magnesium at nearly all locations, including the water supplies for the camps, although the camp water is otherwise within WHO standards. Results from samples collected at some community wells in 2007 showed values mainly within WHO guidelines for potable water, although some microbiological contamination was detected, as well as some metal concentrations slightly above the relevant guidelines at some locations. One well at Ntoroso (KDBH-1) exhibits anomalously high nitrate values. Cadmium appears to be occasionally present in excess of WHO standards at some locations, but there is some inconsistency in the reporting (e.g., the summary table of groundwater quality provided by NGGL indicates an average cadmium value of 0.01 mg/l for Well BH3, which is more than the WHO limit of 0.003 mg/l, whereas the individual results for BH3 indicate that cadmium is consistently below 0.01 mg/l).

As noted above, the dewatering of the Apensu and Subika Pits has already started. Groundwater modeling studies have been reported in a preliminary manner by Geomatrix in a memo dated June 5, 2007 and indicate that the groundwater drawdown may possibly affect local community wells and could also impact some local wetlands. NGGL is in the process of evaluating mitigation measures to the possible effects of the long-term groundwater extraction associated with dewatering of the mining areas.

IFC Policy Action Items

Nil

ESIA Actions Items

M1.5 Develop a mitigation plan for the community water resources or else provide additional sustainable sources of potable water to the affected communities. Develop a comprehensive monitoring plan applicable to mine dewatering activities. Develop a mitigation plan for potential impacts to wetlands caused by the dewatering

Recommendations for Improvement:

- i) Finalize a Water Management Plan that includes all of the components that will be required for surface and groundwater monitoring, especially taking into account the probability that the pit dewaterings may have an impact to community wells and surface water.
- ii) Verify the sustainability of maintaining the WSF with meteoric inflow from its watershed and provide sufficient water to the processing plant over the mine life, or whether additional water sources will be needed, such as continuing with Tano River withdrawals. As noted in December 2006, in the latter case, an environmental assessment of the new scenarios on the regional water resources should be developed; the local communities should be consulted; and a specific change management procedure should be implemented.
- iii) Provide the local authorities and communities with the water quality results when samples from community wells are collected, particularly when WHO guideline exceedances are found.

2.4 Soil Resources*Project Strategy:*

The ESAP defines the measure to prevent and mitigate the impacts on soil resources. Potential impacts of concern include reduction of topsoil fertility and increased erosion due to surface disturbance, vegetation removal, and lack of adequate reclamation. NGGL is committed to implement actions to protect and preserve the topsoil in the mining area, and to reuse it during reclamation. Other important actions are related to erosion minimization through temporary and permanent erosion control measures in disturbed areas. These will include sediment traps, fences and barriers, and stormwater management through drainage collection structures, including berms and other drainage, the most important of which are the four Environmental Control Dams (ECDs 2, 3, 5 and 6). The ECDs have been designed and constructed to accommodate a 10-year, 24-hour precipitation event and minimize potential erosion and sedimentation downstream of the mining area, collecting, settling, infiltrating, and evaporating run-on/run-off water from areas disturbed by mining operations.

NGGL is committed to reclaim all surface disturbances in accordance with applicable Ghanaian regulations and Newmont's Standards for closure and reclamation of mining facilities. A Reclamation Plan was finalized in January 2007 and a reclamation team is in place. Concurrent reclamation will be implemented during mining operations to control sediment and erosion and return the land to a beneficial use as soon as practical. The strategy of salvaging topsoil during surface mining activities will be complemented by a monitoring and control plan to ensure that

reclaimed areas are protected from noxious weed invasion. Access roads, drill pads, sumps, and trenches and other temporary facility areas or disturbed land will be reclaimed as soon as they are no longer needed by the Project.

A responsibility of the reclamation team is to conduct and monitor the soil resource protection activities. As part of its commitments, the NGGL environmental team will conduct periodic inspection of all reclaimed and revegetated areas, as well as of all the stormwater collection points and the ECDs, to monitor success of the reclamation activities and minimization of erosion and sedimentation impacts. Vegetation monitoring, including visual inspection, noxious weed identification and annual sampling for plant community characteristics, is expected to continue for three years after final reclamation. Soil surveys are also included to ensure adequate information to support reclamation and closure activities.

Observations:

Topsoil stripping operations were observed in the field and the overall process appeared to be well managed and the soil carefully stockpiled. NGGL has involved the University of Ghana to conduct research to evaluate the viability of the topsoil under the current storage conditions and also the best methods to use vegetation as part of an erosion and sediment control system. The results of test pits show that anaerobic conditions are developing as a function of burial depth. NGGL should ensure that the end result of the research is the development of procedures that will allow for the soil to be still viable at the time it is reinstated (~15 – 20 yrs).

A comprehensive soil survey for both Ahafo North and South areas has been prepared by Geomatrix that defines the characteristics of soil pedons at locations distributed throughout the area of concern; the results of sampling and analysis of physical and chemical properties of representative profiles, including parameters such as pH, Organic Matter Content, Effective Cation Exchange Capacity, Exchangeable Bases and Base Saturation, and Nutrient Content (nitrogen, phosphorus, potassium); describes the variability of soil types; and establishes appropriate map units. This work has been conducted in association with the Soil Research Institute of the Council for Scientific and Industrial Research of Ghana and appears to represent an adequate baseline from which the soil as a resource can be defined.

Erosion and sediment control is addressed by NGGL with the Ahafo Project Sediment Control Manual, which has been upgraded from the Ghana Project Sediment Control Manual reviewed during the December ECMG mission. This document presents the contents and discussions that are needed for an erosion and sediment control plan as defined in the IFC guidelines for open pit mining and milling (World Bank Environment, Health and Safety Guidelines Mining and Milling - Open Pit, August 1995).

In January 2007³, NGGL finalized the Reclamation Plan for the Ahafo South Mining Project in compliance with requirements of the Ghanaian EPA. This plan is expected to evolve with time, as NGGL will provide updates to the reclamation plan as mine development proceeds and improved procedures are developed based on the results of the ongoing research for topsoil management, etc.

³ This document also has similar quality assurance / quality control problems as the Sediment Control Manual. For example, the date in the footer of the document is 2005.

IFC Policy Action Items

- M1.6 The Ghana Project Sediment Control Manual applies to all NGGL activities in Ghana, and therefore it should be used as a technical base to document current sediment control practices and develop the Ahafo Erosion and Sediment Control Plan.... *This item is considered closed.*
- M1.7 Develop the Closure and Reclamation Plan per the EPA requirements and deadline, and ensure that it is updated up on a three yearly basis and that IFC requirements are included.... *This item is considered closed*

ESIA Action Item

Nil

Recommendations for Improvement:

- i) NGGL should ensure that the research results being undertaken by the University of Ghana are incorporated in their management plans, as appropriate. If the results suggest that different management procedures than those that are currently followed should be implemented to assure that the soil will be viable when reinstatement activities are undertaken, NGGL should integrate these recommendations in their procedures. It is recommended that the research also include identifying lessons learned from other projects with similar topsoil management problems.
- ii) Conduct monitoring in the pilot revegetation area to establish adequate monitoring procedures and integrate this pilot effort into updates of the Reclamation Plan.

2.5 Natural Resources and Ecological Management*Project Strategy:*

The ESIA presents a discussion of the potential impacts to flora, fauna, wetlands, aquatic organisms, and forest reserves associated with project activities in the Ahafo South Project area. Potential indirect and cumulative impacts are also discussed. The Project's ESAP outlines a series of commitments, environmental control measures and additional actions for flora, fauna, forest reserves, wetlands and aquatic organisms. These control measures (e.g., noxious weed monitoring and control plan, fencing around mine pit rims, policies for employees and contractors, reclamation of certain facilities, and sediment and surface water control and management) are primarily designed to address direct impacts. Some additional control measures are also presented in Chapter 2 of the ESIA (e.g., conservation education programs for local communities, education programs for the work force, and replanting of an area equal to that disturbed by the Volta River Authority (VRA) 161 kV distribution line).

NGGL has strived to build alliances with local communities and with non-governmental organizations (NGOs). As part of this effort, the Project has entered into a biodiversity partnership with Conservation International (CI), an internationally recognized NGO and leader in global conservation (referenced in this report as the NGGL-CI Partnership). As a result of this Partnership, the Project has developed a Biodiversity Management Plan (BMP), which outlines both direct and indirect mitigation measures for impacts incurred to natural resources.

Observations

An update on biodiversity-related actions was provided by the Project since the first ECMG field visit in December 2006. Baseline and additional studies are ongoing with CI for most of the components (soil, flora, fauna, wetlands, aquatic organisms) and the first preliminary results in the form of a dedicated database are scheduled to be in place December 2007. A significant accomplishment is the development of the Project's BMP. An outline of the BMP was provided in Chapter 4 of the ESAP and included the following four components: 'On-Site Biodiversity Management', 'Off-Site Biodiversity Management'; 'Biodiversity Partnership' (with CI); and the 'Biodiversity Partnership Work Plan'. The actual BMP appears to be in draft format (dated June 2007, no revision number provided) and contains information on all four of these topics. Note that the observations made in this section are based on a document review only as the ECMG's biodiversity specialist was not able to attend the second site visit.

The BMP contains the following information: reference to IFC requirements (although OP 4.04 [Natural Habitats] is not specifically called out in the text); an outline of a Biodiversity Action Plan, which contains a Species Action Plan and a Habitat Action Plan; reference to the biodiversity offset pilot projects; reference to the biodiversity baseline studies, including indicators and the rapid biodiversity assessments; invasive species management; direct mitigation measures (e.g., noise management, bush fire control, monitoring of abiotic parameters such as sediment control measures, air quality, dust, water quality); and information on the biodiversity education and capacity-building activities and the NGGL-CI partnership.

Other accomplishments realized as part of the NGGL-CI Partnership include the following:

- Biological baseline data collected for the Agyenua Bepo, Mamang, Atewa, and Nyinahin forests;
- Baseline data collected on community biodiversity use;
- Biodiversity Conservation Action Plan for District Assembly reportedly completed⁴; and
- Establishment of a nursery for revegetation purposes.

As currently written, the BMP suffices to serve as a guideline, but it is not sufficiently detailed to track biodiversity-related actions that will be implemented as part of project operations. The overall objective or goal of the document is unclear and should be stated. Section 1.1, *Importance of Biodiversity Management Plan*, contains general information of the importance of biodiversity conservation, but this section does not present the objective, scope, or goal of the document.

While the BMP presents a good start to planning biodiversity-related conservation efforts in the project site, it appears to need further refinements and specifications, as it may be expected since the plan is still in draft. For example, regarding the Species Action Plan (Section 1.3.1) and the Habitat Action Plan (1.3.2), many important questions remain (e.g., which species/habitats are being targeted? What measures will be implemented, and what is the timeline?) At the end of the document, there is a

⁴ Although the ECMG has not received a copy of this.

short section (5.2.3) on the white-necked rockfowl that contains some interesting and useful monitoring measures for this species, but the section is disjointed from the rest of the document. It is not clear if this section is part of the Species Action Plan, and what is its purpose in the document.

It is difficult for the reader to assess the status of most tasks included in the BMP. The document reviewed does not include an overall logistical framework for all on-going and upcoming biodiversity related activities; the logistical framework should present targets, outcomes, and indicators for monitoring each task. Lastly, a monitoring and evaluation framework is not included. This information may be included in Appendix 1 of the BMP, *Action Plan for the Biodiversity Management Plan*, but this document was not provided to D'Appolonia.

Offsets are discussed in two sections of the BMP: in Section 1.4, *Biodiversity Offset Pilot Project*, and in Section 5.2.1, *What are Biodiversity Offsets?* Section 1.4 describes the importance of biodiversity offsets, in general, and references the Project's development of a nursery for revegetation, outreach to local communities to assess their priorities regarding biodiversity conservation, pilot projects to preserve or create ecologically functional habitat for biodiversity conservation, and compensation. ESIA Chapter 4/page 4-67 states that "*Biodiversity offsets will be developed specifically for the Ahafo Project should future foreseeable actions result in disturbance to Forest Reserve areas near the Ahafo Project.*" Based on the document review, the ECMG knows of no such disturbance to forest reserve areas from the Ahafo South project itself⁵. While the ECMG strongly supports the development of a nursery for revegetation, this is typically considered a direct mitigation measure, rather than an offset. Although Section 1.4 mentions 'compensation,' it is not clear to whom (presumably to the local users of natural resources) and how this compensation is being determined. Lastly, outreach to local communities is means to establishing a proper offset, but it is not an offset in and of itself.

In D'Appolonia's previous report for the first field visit (December 2006), it was stated that, "*One important aspect that appears to be missing from the Biodiversity Management Program is a long-term, multi-taxa biodiversity monitoring plan in the Project vicinity.*" This task is mentioned in Section 5.2.2, *Scope of Work* [for the NGGL-CI partnership] of the BMP, as part of a list detailing activities that will be pursued as part of the 'next phase' of CI's and NGGL's collaboration. No further information is provided. A number of other very useful activities are also listed in Section 5.2.2 (e.g., develop and implement improved biodiversity restoration/rehabilitation plans; develop critical species management plan; etc.), although the timeline and scope of these activities are not yet defined.

In D'Appolonia's December 2006 report it was recommended that the Project should "*Reevaluate the wetland control measures given realistic worldwide experience on successful wetland creation,*" and, specifically, that the Project should "*consider conducting a feasibility study, and subsequent action plan, if necessary, to determine if functionally equivalent wetlands could indeed be created in compensation for lost wetlands; or, develop an offset mitigation component in compensation for the lost wetlands, such as sponsoring a related investigation that may promote wetland or watershed conservation in the Project vicinity*". No response was provided by the Project on this topic and the results of the groundwater monitoring indicates that

⁵ This statement refers only to the Ahafo South project site, not the Associated Facility (VRA distribution line).

wetlands might be impacted by the drawdown of groundwater. Section 3.6 in the BMP states that water quality samples collected from the water storage facility 'generally complied' with EPA guidelines, but this is not evidence that the water storage facility will eventually replicate ecosystem functioning and the hydrological regime of a naturally-occurring wetland.

D'Appolonia also recommended developing a conservation education program for project workers to be included as part of the Project's 'Environmental Training Program' in line with ESIA commitments (page 2-54 of the ESIA; the Environmental Training Program is described in Section 5 [page 5-31] of the ESIA), but this does not appear to be included in the BMP.

It is understood from discussions with CI that they believe that it will be best if the BMP is not finalized until sufficient additional baseline data are gathered and evaluated.

IFC Policy Action Items

Nil

ESIA Action Items

- M1.8 Ensure that the committed noxious weed monitoring and control plan includes alien invasive plant species and ensure that any revegetation activities conducted as part of site reclamation are carried out with native species and non-invasive species relevant to the identified final land use. Develop the plan as soon as practical, taking into account that reclamation activities are already ongoing.
- M2.1 The multi-taxa biodiversity monitoring program should be fully developed and made available.

Recommendations for Improvement:

- i) The June 2007 version of the BMP is in draft format. Although it is understood that the BMP will not be finalized until sufficient additional baseline data are gathered and evaluated, it is recommended that NGGL develop a final version that contains, at a minimum, the following: an overall objective or goal; further details on the implementation of each task; roles and responsibilities; a timeline for implementation; a logistical framework containing targets, outcomes, and monitoring indicators; and monitoring and evaluation mechanisms.
- ii) The planning and implementation of the long-term multi-taxa biodiversity monitoring program (one that lends itself to inferential statistics) should be expedited.
- iii) It is recommended that the BMP contain a section that summarizes all biodiversity related baseline studies and rapid assessments (i.e., provide a list of all the baseline studies/rapid assessments performed). The Project has dedicated a significant amount of time on these efforts, and it would be useful to have a comprehensive and accurate list of these assessments, where they took place, and their overall objective referenced in the BMP document.
- iv) Section 1.4, *Biodiversity Action Plan*, in the BMP should be fully developed and finalized.

- v) It is recommended that the 'creation of a nursery' is not included in Section 1.4 of the BMP as an offset measure.
- vi) The reference to 'compensation' in Section 1.4 of the BMP should be clarified, providing sufficient details to implement this measure.
- vii) The wetland control measures should be re-evaluated, given realistic worldwide experience on successful wetland creation:
 - Consider conducting a feasibility study, and subsequent action plan, if necessary, to determine if functionally equivalent wetlands could indeed be created in compensation for lost wetlands; or,
 - Develop an offset mitigation component in compensation for the lost wetlands, such as sponsoring a related investigation that may promote wetland or watershed conservation in the Project vicinity (*repeated recommendation*).
- viii) A conservation education program for project workers should be considered to be included as part of the Project's 'Environmental Training Program' in line with ESIA commitments (*repeated recommendation*).

2.6 Waste Management

Project Strategy:

According to the ESIA, "Non-hazardous waste disposal will be conducted in accordance with Ghanaian requirements and NGGL's waste disposal protocols. NGGL will monitor waste generation and disposal conditions during construction, operation, and closure. Should conditions warrant, NGGL will implement additional waste minimization, treatment, and disposal measures beyond those currently identified".

A draft general Waste Management Plan (WMP) has been developed by the project which includes the minimum requirements for the management of hazardous, non-hazardous wastes, and wastewater generated at NGGL Ahafo Operations. The manual applies to Newmont and Contractor wastes associated with Ahafo Operations. Responsibilities/accountabilities, as well as procedures for wastes identification, classification, segregation, temporary storage, and disposal are also provided. A number of SOPs including "Landfill Management", "Inert and Putrescible Waste Disposal Management", "Sewage Treatment Plant and Waste Management", "Desilting of Washing Bay and Interceptors", and "Medical Waste Procedure" are also currently available, although still in a draft form.

Current project practice for the collection and onsite disposal of inert wastes is to use an inert waste dump trench. Food/putrescible waste, previously sent to the Kumasi Metropolitan Landfill, is now also disposed in onsite trenches. According to the information provided, the practice of using the on-site incinerator to process wet food waste, foreseen by the WMP, has been suspended since September 2006. A potential future disposal option through composting is under evaluation.

Because of the lack of offsite infrastructure to treat and dispose of hazardous waste in Ghana, the need for a hazardous waste management plan was identified in the ESIA. The Project acknowledged the need to develop a waste minimization program and a draft version of a hazardous waste management plan is now available. The current practice for some hazardous waste, including contaminated soil, involves the collection, temporary storage at the onsite hazardous waste shed, and offsite disposal through a Contractor at the Kumasi Metropolitan Landfill. Waste oil and lubricants

are temporarily stored at the Shell/Storage Yards, and disposed offsite for reuse through a Contractor.

Under normal operations, medical wastes are reported to be processed through an on-site incinerator, while offsite incineration is used under emergency situations or when the on-site plant is non-functional.

Two permanent packaged Sewage Treatment Plants (STPs) are installed at the main camp and at the SSV. The treated effluent is currently disposed at the TSF. Excess sludge is currently sent offsite to the Kumasi Metropolitan Landfill through a Contractor, although the option of dewatering and reuse in composting for land rehabilitation is reported to be under evaluation by the Project.

NGGL has committed to monitor solid and liquid waste generation (including wastewater) and disposal conditions throughout the life of the Project. A number of forms to classify, monitor and track the different waste streams were provided during the visit.

Observations:

Overall, the waste management practices appear to be improved since the first visit in December 2006, although further improvements are still needed. A project-wide waste management plan and different standard operating procedures, although in a draft form, have now been developed and available.

Solid and Liquid Waste Management

The onsite inert waste trench was visited during the survey. The site is supervised and trucks are reportedly inspected for contents before being allowed to dump. According to a sign posted at the facility, only cardboard, waste paper, packing, plastics, ceramics, scrap air filters, glass, scrap steel, light vehicle tires, and uncontaminated storage containers can be disposed. An inert waste trucking register is now available to record waste sources and amounts and data were provided for the last several months. Soil cover is reportedly placed on a daily basis and at the time of the visit disposed waste was observed to be covered. Heavy vehicle used tires are currently stored in a dedicated area with a final disposal solution not yet defined. The option to recycle them in South Africa through a specialized contractor is under evaluation, although the option of disposal by burying them in rock disposal area appears to be the preferred one.

As noted above, food/putrescible domestic waste was incinerated at the onsite incineration facility located at the main plant site, but this practice stopped in September 2006 due to technical difficulties with the incinerator. All putrescible wastes were subsequently transported to the Kumasi landfill, which was audited by NGGL and considered well engineered with sufficient management/monitoring systems in place and operated with adequate staff on site. Only recently the use of the Kumasi landfill for food waste disposal has been discontinued and wastes are reported to be buried in a trench onsite.

The Kumasi facility, located at Dompase within the Kumasi urban area, was visited by the ECMG. According to the information provided, the landfill was constructed as part of a World Bank financed project. The plant is currently managed by the Kumasi Metropolitan Assembly and operated by a private company with a staff of 38 people reported to work on site. The facility, in operation since 2004, was designed for 1000

metric tons/day with a 15-year lifespan to dispose of the waste generated within the urban area. The facility occupies 40 hectares and currently includes one pit for domestic waste disposal, one borrow pit area, one area for burning flammable waste, a waste stabilization pond system for sewage disposal, and some ancillary facilities including a guard house with a weighbridge, office/welfare buildings, washing bay, garage for landfill equipment, and a diesel fuel storage tank. During the visit it was reported that a second pit is planned in the future. The current cell is provided with a composite liner of compacted clay and geomembrane (HDPE), a gravity leachate collection system connected to the treatment ponds, and a gas collection system with perforated pipes and monitoring wells. A plan for produced gas collection and use to generate electrical power is reportedly under evaluation. The waste stabilization system includes lined treatment ponds that receive both sewage and the leachate from the landfill. The sludge from the ponds is periodically removed, dried and landfilled. Although the option of re-using the sludge as compost is under evaluation, from what was observed during the visit, this practice appears to be far from a realistic implementation.

Observations from the site visit are the following. Screening of the incoming sludge appears to be poor and many plastic bags were noted in the primary ponds. The treated effluent is disposed of into the Oda River, 3 km downstream the discharging point. No leachate recycling and no system to divert the treated effluent were reported to be available. According to the information provided during the survey, analyses of the liquid effluent are performed every six months in compliance with EPA requirements, but the actual schedule and results were not made available, except to report that effluent often exceeds the limits for BOD, pH and metals. Three groundwater monitoring boreholes, one upstream and two downstream the landfill, are reported to have been monitored a single time since starting operation. The results were reported to be in compliance with relevant standards, although no documentation was provided.

Although it is recognized that the Kumasi landfill is relatively well designed and probably represents the only modern disposal site available in the area, problems in the management of the facility were observed during the visit, as noted:

- A large part of the pit had exposed waste, although it was reported that daily/weekly cover is routinely placed.
- No control on vehicles accessing the facility was noted during the visit. Trucks entering the site, during the ECMG visit, were not weighted and no check of the material transported was performed, although waste trucking forms were available at the site and control on vehicles accessing the facility was reported to be performed. Control and management of the waste and sewage dumping procedures do not appear to be followed.
- Poor segregation was observed at the site.
- Open burning of flammable waste including oily contaminated waste appears to be a common practice, although in a designated area within the facility. Non-flammable wastes were also observed in this area and no air emission controls are available.

- Poor safety measures and lack of PPE were observed for the workers within the facility.
- The presence of many scavengers was noted around the pit.
- No measures to control odors appeared to be adopted, although sprays were reported to be used when complaints from local communities leaving nearby the facility were received.

During the audit, NGGL reported that the use of the Kumasi Metropolitan Landfill for disposal of food/putrescible waste has already been discontinued and only sewage sludge and only relatively limited waste streams, like oily rags, continue to be disposed from Ahafo at the facility.

As noted above, the current practice for the disposal of putrescible waste is dumping in a trench located in an area that will ultimately be covered by a waste rock dump. On-site trench disposal of putrescible waste is not considered as best practice due to the lack of leachate management, which, according to the WB Pollution Prevention and Abatement Handbook, “requires that leachate from solid waste disposal sites should be sampled and tested monthly, using strategically located sampling points”. As this is not possible with simple dump sites, this option is non-compliant with IFC standards and should be discontinued as soon as practical. Alternative options, such as composting of putrescible waste for agricultural application, currently under evaluation by the Project, should be explored and implemented as soon as practical.

The general requirements for the management of hazardous material are outlined in the Ahafo hazardous waste storage protocol and in the waste management plan. The hazardous storage facility under construction during the December visit is now completed and fully operational. The site was visited and appears to be well designed and properly operated. The Mantract, Liebherr, and Shell workshops were also visited during the audit. High standards of hazardous waste management were achieved with good housekeeping, segregation, and organization observed. All containment sites are provided with paved and bounded areas connected to water/oil separators for spill and washing waters collection. Oil spill kits were found to be available as well as the implementation of measures to prevent potential spills. Only a few observations for further improvement can be made, including the provision of roofs for the lubricants storage area at the Shell workshop and at the fueling area to minimize the amount generated and the need for treating potentially contaminated rainwater.

A bioremediation/volatilization pad was reported to be under construction in an area already selected to treat oily contaminated soil. According to the information provided, the plant, expected to be in operation by the end of August, will reduce the amount of oily waste currently sent to the Kumasi Metropolitan Landfill.

The final disposal of hazardous waste is managed by a Ghanaian certified Contractor (Presank). In response to an ECMG observation from December 2006, NGGL conducted an audit of Presank and the results of this audit were provided to the ECMG during this visit. The Presank workshop was also visited by the ECMG during this mission and the facility was found to be well designed and operated with waste truck registers to record the waste streams and amounts collected. Two concrete bunds to temporary store used oils/lubricants containers and chemicals,

respectively, are present. Three oil/water separation sumps collect the rainfall from paved areas and potential spills. Oil spill kits as well as fire extinguishers were found to be available and evidence of internal training was provided. According to the interview with the facility management, segregation of the incoming waste is performed: used oil is reportedly sold to manufacturing companies in Tema and Aura for use in firing steam boilers, while used batteries are recycled.

The apparent good management practices being followed by Presank are contradicted by the information provided in the Hazardous Waste Tracking Register, which indicates that the ultimate disposal site for much of the hazardous waste stream (~ 28 tons of solid hazardous waste and ~ 68,000 liters of spent oil and grease in the first half of 2007) is the Kumasi landfill. It is understood that the Waste Tracking register is incorrect, but it is apparent that waste tracking procedures will need to be improved. This will be a subject that the ECMG will pursue during upcoming visits.

According to the waste management plan and the medical waste standard operating procedure, medical waste should be incinerated at the on-site facility. The plant, previously used to also treat wet food, dry food, and other combustibles has not been operable since January 2007 and it has been necessary to treat medical wastes in an offsite incinerator. Incinerator emission and ash tests are not available.

Wastewater Management

NGGL operates two sewage treatment plants (STP), one located at the site plant and camp and another unit for the Senior Staff Village (SSV). The camp STP was visited and found to be well maintained and operational, as observed in the previous visit in December 2006. According to the data provided, both STPs appear to be sufficient to treat current demand and consistent effluent monitoring is performed. From the results of daily effluent tests provided, the effluent discharge quality usually complies with the Ghana standards for mining and minerals processing guidelines for both plants. Although exceedances of total coliforms, E. coli, conductivity, BOD₅, and COD were registered in March, April and May, recent data are in compliance with the relevant legislation (although with some exceedances limited to few occasions), and treated effluent is not discharged to surface water or soil, but, after testing, conveyed to the TSF, where the water is mixed with the decant water from the tailings and recycled for processing.

Although anticipated in the original design, the use of leach fields for effluent discharge was suspended due to the clayey nature of the local soils, which prevented adequate infiltration of effluent.

As discussed above, sludge from both STPs is currently hauled from Ahafo to the Kumasi Metropolitan Landfill. In order to eliminate disposal at Kumasi, potential future sludge disposal options are under evaluation by NGGL including dewatering and reuse in composting for land rehabilitation and/or agricultural activities. The alternative of dewatering the sludge and disposal by onsite incineration is also being considered.

IFC Policy Action Items

- M1.9 Conduct formal EHS audits of the off-site waste disposal facilities and waste management contractor practices for sewage sludge, food scraps and recyclable waste. *Item considered closed*
- M2.2 Discontinue the use of the Kumasi facility unless associated with capacity building or facility improvements.
- M2.3 On-site trench disposal of non-inert waste (putrescible waste) is not good practice due to the lack of leachate management in compliance with WB standards. Re-evaluate this option and consider compliant alternatives, such as the development of a dedicated landfill with an appropriate leachate collection system, composting, maceration and disposal through STPs, or some other compliant solution. In addition, NGGL has not properly tracked their hazardous waste stream and needs to amend their register to accurately reflect quantities of waste generated and their ultimate disposal processes.

ESIA Action Items

- M1.10 Finalize the site-specific Waste Management Procedure/Plan.
- M1.11 Conduct stack emissions testing at the existing on-site incineration facility. *Item considered closed, since the on-site incinerator has been discontinued. If a decision is made to reactivate this unit, stack emissions monitoring should be conducted.*

Recommendations for Improvement:

- i) Consider reactivating the on-site incinerator and evaluate the possibility of its use for medical waste, and food-contaminated waste (paper, etc.), as stated in the waste management plan. If putrescible waste with a high moisture content is removed from the waste stream to be incinerated, it may be practical to effectively operate an on-site incinerator.
- ii) Instead of on-site trenching of food/putrescible waste, actively develop the composting option (or other compliant option) and also consider its application for sewage sludge treatment.
- iii) Consider the option of the on-site dewatering of sludge and subsequent disposal through incineration.
- iv) If offsite incineration is implemented for Project streams (e.g., medical waste), ensure that the facility is well operated and sufficient safeguards are implemented, according to applicable and relevant regulations.
- v) Continue to work on developing a centralized waste management system, including a waste segregation and treatment facility, a bioremediation facility, and a non-hazardous waste engineered landfill to satisfy Project requirements, present needs and expected growing demand.
- vi) Consider the provision of roofs for the lubricants storage area at the Shell workshop and at the fueling area to minimize the amount of potentially contaminated runoff generated at these two sites.

2.7 *Hazardous Materials Management*

Hazardous Material Transport, Storage, Use and Disposal

Project Strategy:

The basic procedures developed by NGGL for the management of hazardous materials are outlined in the ESIA under the title of "Material Handling" specific to chemicals and other materials located on NGGL properties and cover the following materials and activities:

- Cyanide transportation, storage, handling and mixing;
- Caustic soda transportation, storage, handling and mixing;
- Sodium hypochlorite transportation, storage, handling and mixing; and
- Explosives and accessories handling, storage and use.

Specific procedures developed with regard to material handling, include the following:

- Spill response actions;
- Disposal of shipment containers;
- Emergency evacuations;
- Mixing and usage precautions;
- PPE requirements;
- First-aid procedures; and
- Labeling of materials and posting of Material Safety Data Sheets (MSDSs).

The NGGL training programs cover the management of hazardous materials.

The ESAP defines an additional goal of hazardous materials management associated with community safety to be "reduction in conflicts during transportation of hazardous materials on roads; increase in safety of public and workers during transport of materials."

The applicable and relevant IFC guidelines are the following: World Bank Environment, Health and Safety Guidelines Mining and Milling - Open Pit, August 1995; IFC Hazardous Materials Management Guidelines, December 2001; and IFC Environmental and Social Guidelines for Occupational Health and Safety, June 2003.

Observations:

Within the HSLP organizations, the plans and procedures relative to the management of hazardous materials are not yet finalized, a situation which was already observed by the ECMG in December 2006. Nevertheless, the handling and storage of hazardous materials at the area of the processing plant continues to appear to be satisfactory. A significant improvement was the addition of a roof over the area where hydrochloric acid is being stored. Work areas where hazardous materials could be present within the processing plant and also in the truckshop/workshop areas were found to be consistently clean and well managed.

IFC Compliance Action Items

M1.12 Expedite the finalization of all plans and procedures related to the management of hazardous materials.

M1.13 Expedite the implementation of the recommendations identified in the research and risk assessment of Ghana road transportation and periodically review the risk assessment based on current transport conditions. Ensure that hazardous materials transport monitoring and control inside and outside the Project boundaries is adequately conducted and recorded in a specific register.

ESIA Action Items

Nil

Recommendations for Improvement:

- i) Sort out the differences in what is expected from the HSLP and environmental groups such that their different responsibilities are clearly defined (*repeated recommendation*).

Cyanide Management

Project Strategy:

Cyanide is the means for extracting gold from the mined ore. The ore is first subject to crushing, grinding and milling and then processed with carbon-in-leach cyanidation, which is then followed by elution and refining for gold recovery. There is a secondary gravity flotation circuit for collecting gold concentrates for intense cyanidation and electrowinning prior to refining and gold recovery. Cyanide is delivered to the site as solid sodium cyanide in a truck-mounted isotank for solid-to-liquid sparging, which allows the cyanide supplier to mix the solid sodium cyanide with water at the site to achieve the required 30-percent strength for offloading in a designated mixing tank. The cyanide solution is conveyed from the mixing tank in use to storage tanks for delivery to the processing circuit. The cyanide solution conveyances are within double containment and pumped within instrumented and monitored pipelines.

NGGL has an operational Ahafo Cyanide Management Plan (May 2006) that describes the measures that the Project will implement to minimize the risks to employees, communities and the environment from its use of cyanide, as well as NGGL's commitment to programs for employee safety and training and its plans and procedures for responses to cyanide exposures and releases. The Plan also includes NGGL's commitments to the public disclosure of cyanide-related information.

On October 4, the pre-operations phase of the Ahafo Project was certified under the International Cyanide Management Code (ICMC) based on an external third-party audit conducted on August 23, 2006. The ICMC, also known as the Cyanide Code, is a voluntary industry program for the gold mining industry to promote:

- Responsible management of cyanide used in gold mining;
- Enhance the protection of human health; and
- Reduce the potential for environmental impacts.

Companies that become signatories to the Code must have their operations audited by an independent third party to demonstrate their compliance with the Code.

Observations:

During the December 2006 visit, the basic plans for sodium cyanide management were reviewed. During this visit interviews were held with the NGGL H&S individuals responsible for the management of cyanide. Also, the ECMG was supplied with the results of an audit conducted by Golder Associates on 25 to 29 June 2007 to evaluate compliance with the International Cyanide Management Code (ICMC). All items have been classified as having 'Full' or 'Substantial' compliance. This audit confirmed that the cyanide supplier Orica was certified as fully compliant with the ICMC in June 2007, except for transportation as noted below. A certain number of recommendations for improvement were made by the auditors related mainly to emergency equipment and procedures.

Cyanide transportation is currently being undertaken with the transportation plan provided by the cyanide transporter (Barbex Technical Services Ltd). A Sodium Cyanide Transportation Protocol, developed by the transporter for NGGL and dated 27 June 2006, was supplied by NGGL during this visit. The Protocol covers the approved transport routes, the hiring and training of drivers, packaging and labeling, the safety and security during transport, and emergency response. The last survey of the transport routes was implemented on June 2006. It is understood that a Cyanide Code audit of cyanide transportation has been carried out as requested by Orica, but the results were not available to the ICMC auditors and were not provided to the ECMG.

As noted in the ECMG report from December 2006, the various plans and procedures associated with the management of cyanide are draft documents associated with the construction phase. A relatively large number of plans and procedures still remain to be finalized for Operations, including the Cyanide Management Procedure. NGGL has its own cyanide transportation plan that was based on a transportation risk assessment: "Transport Management Plan for Sodium Cyanide Product" – July 2005 – and the "Research and Risk Assessment of Ghana Road Transportation" – July 2005, both of which were reviewed by the ECMG in December 2006. The ICMC certification was assigned the Ahafo Project based on pre-operational conditions.

During this visit, a cyanide truck was performing unloading operations. The presence of an escort vehicle consistent with the Transport Protocol was observed. An Emergency Response Team (ERT) vehicle for fast intervention was present at the unloading site. The personnel involved in the cyanide unloading were found to wear the prescribed PPE.

IFC Policy Actions

M1.14 Expedite the finalization all plans and procedures related to cyanide, as they are critical documents needed to be followed during the current operations phase.

ESIA Action Items

Nil

Recommendation for Improvement:

- i) NGGL to consider implementation of the observations made in the 2007 Audit report, mainly relevant to improvements in emergency equipment and procedures.

- ii) The Transportation Protocol should be verified and updated for any modification to the approved routes (last route survey on June 2006).

TSF Cyanide Management

Project Strategy:

After completion of the processing, the cyanide within the tailings is recycled using a tailings wash circuit to achieve acceptable wildlife and livestock contact concentrations (Weak Acid Dissociable cyanide concentration <50 mg/l) in the Tailings Storage Facility (TSF), where the tailings are piped. The Project has committed not to discharge cyanide contaminated water into any stream within any receiving water body. The tailings water is decanted and conveyed back to the process facilities for re-use. As defined by the IFC guidelines (World Bank Environment, Health and Safety Guidelines Mining and Milling - Open Pit), measures to prevent access by wildlife and livestock are required for all open waters (including tailings impoundments) where WAD cyanide is in excess of 50 mg/l. A hydrogen peroxide (H₂O₂) cyanide destruction unit is available on-site for emergency use.

Observations:

The Tailings Management Procedure is still a draft document. Nevertheless, the cyanide management aspects of the tailings facility continue to be carefully monitored. Since the ECMG visit in 2006, the concentration of cyanide in the TSF decant pond has been less than about 5 mg/l, with only one anomalous excursion approaching 20 mg/l Weak Acid Dissociable (WAD) cyanide, still significantly less than the applicable and relevant limit of 50 mg/l for wildlife and livestock protection. The WAD cyanide concentration has ranged from 0 to 102.9 mg/l in spigot grab samples with approximately 75% exceeding the value of 50 mg/l.

NGGL has installed guns to automatically shoot blanks to scare birds away from the TSF. This system was observed in the field to be operational.

NGGL is in the process of constructing a tailings washing plant to recycle cyanide that would normally go to the TSF, back into the plant. Tailings washing would allow that WAD cyanide levels are below 50 mg/l at the spigot. NGGL indicated that the projected date for operation of this plant is the end of 2007.

<i>IFC Policy Action Item</i>

Nil

<i>ESIA Action Item</i>

Nil

Flammable Materials Management

Project Strategy:

Flammable Materials (fuels and lubricants) are used at the site for vehicle supply. These materials are transported to the site from the Tema refinery (distance approximately 400 km). Fuel is stored in two tanks in a dedicated area managed by Shell. In the same area a storage area for storing of drums of lubricants is present.

The operations of transporting, unloading and distributing the fuel to the users are under the responsibility of Shell.

Observations:

The fuel and lubricant storage area was visited by the ECMG and found to be equipped with containment bunds and a concrete floor to contain spills. Portable extinguishers are provided around the area. Due to the Flash Point of the materials stored, no fixed firefighting system is needed, according to the design standards adopted. If necessary, the foam truck operated by NGGL ERT can intervene.

The Shell HSE procedure "Road Transport of Goods, Equipment and Products" dated November 2003 was provided to the ECMG. This procedure covers the organization and responsibilities for road safety, the hazards and effects management process for road transport, and road safety planning.

According to the information given by the site manager, driving is allowed during daytime only, and a maximum speed of 60 km/h is allowed. Only trained drivers are allowed, with training by the "Friends of the Driver" association. First aid and equipment for a containment of small spills are provided with each truck. In case of an emergency, the Tema refinery will be alerted, which in turn alerts the emergency center closest to the accident location.

A typical "Driver Journey Plan" was also provided to the ECMG. The Journey Plan documents the vehicle and driver involved, indicates the route to be taken, as well as areas requiring special caution (black spots) along the route.

A Site-Specific Operating Manual detailing the Emergency Plan was reported to be available.

<i>IFC Policy Action Item</i>

Nil

<i>ESIA Action Item</i>

Nil

3 Occupational Health and Safety

3.1 Occupational Health & Safety Management

Project Strategy:

The Project policy was described in the first visit report, as follows:

"NGGL currently maintains and actively manages an extensive occupational health and safety program ("Loss Control") at the Ahafo South Project site. The program, including appropriate training and monitoring procedures, will continue once operations commence to ensure high standards of health and safety are maintained."

The policy and principles as evidenced in the first visit have not been modified and are still valid. The HSLP (Health, Safety, Loss Prevention) organization in place at the first visit time is still operational. As noted in Section 1.1, NGGL is planning to obtain certification under the OHSAS and ISO14001 standards, which will replace the current Newmont Five Star system.

Observations:

A new HSLP Manager has recently been appointed. Under the new management actions to improve HSLP department functionality, identifying priorities and performing a gap analysis (planned for late 2007), are being implemented. The staffing of HSLP department has been increased from the December 2006 visit and now totals 43 people, 11 of which are senior staff. The concerns expressed in the December 2006 about the understaffing of the HSLP department and the lack of an Industrial Hygienist function have now been addressed and substantially resolved.

An accident register and investigation procedures are in place, and a new procedure to improve accident investigations including action tracking is being prepared and is expected to be issued shortly. At present, accident investigations are performed by area supervisors with assistance from HSLP, and these are tracked by HSLP staff who monitor the completion of investigations and the follow-up of corrective actions identified.

The updated Incident/Accident Register was made available to ECMG; a total of 185 incidents classified as 'HSLP' (i.e. including events causing Property Damages, Injuries etc.) have been registered since January 2007 (including both NGGL and Contractors employees). Only one of these accidents is classified LTI of Severity 5 (the most severe), one is classified in Severity 4 (all these involved Property damage and no injury), three are classified under Severity 3. Seven accidents required medical treatment or first aid.

According to the HSLP Department management and data provided, light vehicle use is the major cause of incidents.

A generally widespread use of appropriate personnel protective equipment (PPE) was observed. General housekeeping appears to be good both in NGGL and in contractors' areas, with significant evidence of firefighting equipment testing. No unsafe acts were observed during the visit. Some minor deviations from good practice were observed and discussed with NGGL HSLP staff during the visit.

Although procedures were followed in the workplace and the overall attitude to the HSLP programs was consistently positive, the HSLP department still lacks final technical procedures and standards, as identified during the first ECMG. It is understood that the efforts of HSLP Management have been directed towards covering the most critical gaps with staffing, training and developing good work practices. The next milestone for the HSLP department will be the finalization of an appropriate set of procedures including monitoring and compliance with IFC guidelines.

A Training Management System is present, and training is coordinated by the Learning and Development (L&D) department for both NGGL and Contractor employees. Training is given on general induction, processing induction, cyanide

safety, and other safety-specific issues in English and in local language according to the needs.

A database of training records (People Development Center, PDC, database) is maintained showing the percentage of completion of each individual training program (that includes mandatory courses for all personnel and specific courses according to their function). The courses that need to be attended when changing position or associated with promotions are defined in a 'Competency Flowchart'.

The training program appears to be complete. The ECMG examined in detail the material used for the training on 'Chemical Awareness,' which was found to be adequate.

<i>IFC Policy Action Items</i>

Nil

<i>ESIA Action Items</i>

Nil

Recommendations for Improvement:

- i) HSLP technical standards and procedures should be finalized to cover the most important concerns in Ahafo operations.

3.2 Emergency Preparedness and Response

Observations:

The Emergency Preparedness and Response (ERP) Plan was found to present several deficiencies during the first monitoring visit, in particular related to the lack of appropriate assessment of potential emergency scenarios and lack of a specific risk assessment to support operations. Also, procedures to compare an emergency situation were not given and maps to help in the management of emergencies were not present. Furthermore, the training of ERT and equipment available was found to be insufficient.

In general, the ECMG observed in December 2006 that the HSLP organization was just starting to develop capabilities and that the Emergency Response system was still not adequate to promptly and effectively respond to a serious emergency.

During the second visit, the ECMG was provided a revision to the Emergency Response Plan. This plan, which is still in a draft form, now includes cyanide accident management procedures and does present an update in terms of the individuals involved with the notification process. However, it still presents the same deficiencies found in the first visit. In particular, no hazard identification appears to have been done to assess the hazards that are specific to the site and operations, and, therefore, the content of the ERP is of a general nature and lacking precise information to deal with an emergency at the Ahafo site. As an example, certain hazards that should be considered (e.g., liquid fuel fires) are not described at all in the report. Also, general statements such as "Keep personnel and equipment out of possible flash flood areas" or "Initiate measures to abate the release if this can be done safely" are given, but there is no indication or maps to indicate where the

possible flood areas are located and no indication of means and procedures to abate and contain a release is presented. The recommendations and suggestions given in the first visit report on this subject are effectively all still valid, and it is recommended that they be considered further to improve the quality and effectiveness of the ERP.

The staffing and equipment of the ERT was reviewed. Training of the ERT staff has now started and they are now considered capable to deal with a general emergency. The equipment provided has been improved and now includes a fire truck, a spill emergency trailer, a general emergency truck, a water truck, and an ambulance. Construction to enlarge and improve the ERT areas, with provision of additional facilities for people and equipment, is in progress.

These observations show that HSLP management is working towards improving the ERT capabilities, giving priority to the training of personnel and the provision of equipment. From the observations and the documentation received, the ERT capabilities are significantly improved with respect to the first ECMG visit, but the deficiencies found with the ERP still exist. The new revision of the Plan does not answer many of the major points raised during the first visit.

IFC Policy Action Items

M1.15 Prepare a site-specific ERP that can serve as a complete guide to emergency management, from a risk assessment to identify vulnerabilities to detailed procedures to respond to a full range of situations, ranging from small spills to natural disasters. Include maps to identify access and escape routes, muster points, as well as the risk "hot spots" and sensitive receptors where particular care is required to manage emergency situations.

ESIA Action Items

Nil

Recommendations for Improvement:

- i) Continue to focus on practical training of the Emergency Response Team.

3.3. Noise and Vibrations

Project Strategy:

Sources of noise and vibrations include machinery, generators, the overall processing plant, vehicular traffic and blasting. Given that noise and vibrations can adversely affect both community and workplace environments, there are requirements for monitoring within the Project social staff, as well as with the HSLP department. The ESAP and ESIA indicate a requirement for noise and vibrations monitoring only within the context of the potential impact to the local community. Noise and vibrations are, of course, a normal part of industrial hygiene in the workplace and the HSLP department has SOPs related to noise management and exposure guidelines.

The applicable and relevant IFC guidelines are the following: World Bank Environment, Health and Safety Guidelines Mining and Milling - Open Pit, August 1995; and IFC Environmental and Social Guidelines for Occupational Health and Safety, June 2003.

*Observations:*Community Monitoring

Noise and vibrations from blasting are being monitored under the requirements of the Social Action Plan. The Project has established limits for vibration compliance to be compliant limits of 5mm/s peak particle velocity (ppv) and 115 dB for the air blast. As described in greater detail in the December 2006 ECMG report, these standards are very conservative in terms of what constitutes best practice.

Blast monitoring data up to July 2007 were reviewed and found to be within Project standards, except for a few slight excursions of the measured air blast, which exceeded the Project standard, but were still within IFC guidelines.

A set of noise monitoring data from January to May 2007 (measurements mainly concentrated during May) done on six locations in the surroundings of the Ahafo site was given to the ECMG. Sound levels (Leq, in dBA) are found to be highly variable; values between 32 and 106 dBA during daytime have been found in Kantinka Ville, while in the other locations the values reach maximum levels between 68 to 97, and minimum levels between 20 and 50 (daytime). No data are available to distinguish the contribution to noise from NGGL operations from background noise sources or other activities.

Workplace Monitoring

As noted in Section 3.1, an Industrial Hygienist position has been added to the HSLP department, starting in March 2007. A process area survey was done on January 2007 and the results of the survey were made available to the ECMG. As a result of the survey, a map of the process plant site, showing the areas where ear protection is mandatory, has been issued. These areas are designated within the plant. During the ECMG survey, the process plant was shut down so no direct observation of the use of ear protection by personnel was possible. The information provided to the ECMG indicates that occupational noise is being addressed and that appropriate actions are in place to control the working environment.

IFC Policy Action Items

- M1.16 Conduct noise surveys of the various workplaces and verify that the PPE assigned to the workers is appropriate for their noise environment. *Item considered closed*
- M1.17 Verify that Project activities do not adversely impact the local communities from the standpoint of noise and vibrations that could originate from Project activities other than those associated with blasting, such as from Project-related vehicular traffic. Ensure that compliance with applicable and relevant standards is monitored.⁶
- M2.4 Ensure that the standards used for workplace noise are at least as conservative as those adopted in the IFC Occupational Health and Safety Guideline⁷.

⁶ Note that it is possible that this objective has been achieved, but it is not practical to make this assessment with the data as presented. Therefore, the item is not closed. A specific evaluation of data should be developed and/or an ad-hoc campaign, designed to distinguish conditions associated with Project activities in the closest community receptors and background conditions, should be conducted.

⁷ IFC Environmental and Social Guidelines for Occupational Health & Safety, June 24, 2003.

<i>ESIA Action Item</i>

Nil

3.4 Occupational Health

Project Strategy:

NGGL has principles for occupational health and hygiene that are well established at the Corporate level within their Five Star Program, specifically the HSLP Standard 30 titled "Occupational Health and Hygiene," which has the stated intent "*to anticipate, recognize, evaluate, and control occupational exposures to levels which potentially eliminate occupational disease by minimizing occupational health risk.*" This intent is reflected in the procedures defined in the ESIA, in particular for malaria and HIV/AIDS.

The applicable and relevant IFC guidelines are the following: World Bank Environment, Health and Safety Guidelines Mining and Milling - Open Pit, August 1995; and IFC Environmental and Social Guidelines for Occupational Health and Safety, June 2003.

Observations:

As noted in Section 3.1, the position of industrial hygienist has been filled since March 2007 and the expectation is that this person will be supported by an additional staff member before the end of 2007. The provision and staffing for an industrial hygiene (IH) function, together with the provision of specific IH goals, demonstrate a commitment by NGGL to maintain a healthy working environment.

Under the supervision of the Industrial Hygienist, a Baseline Health Risk Assessment was prepared by NGGL and International SOS on March 2007 to identify areas of concern from the point of view of Occupational Health. This Baseline study has adopted a semi-quantitative approach using a Risk Assessment Matrix and considering also Ghana Legal requirements. The risk sources considered include dusts, chemicals, noise, microbes, and heat.

The survey has identified a number of recommendations, summarized in the Baseline Study Executive Summary and has identified dust and noise exposure as the highest risks. Different dust protection masks have been identified as providing a better protection. A detailed analysis per process area to assess the adequacy of PPE provided has also been developed.

Malaria is recognized as one of the main endemic health risks throughout Ghana. A malaria control program led by an entomologist had been initiated at the time of the first ECMG visit, which was found to be enforced during this second visit. Malaria control is under the responsibility of HSLP Manager with the assistance of the International SOS clinic.

A baseline study was conducted by International SOS in November 2006 that led to 64 recommendations to minimize the risk of contracting malaria. A follow-up table updated 5 June 2007 was provided to ECMG that documents the status of implementing these recommendations.

Specific measures are taken to avoid presence of mosquitoes and avoid contracting malaria within a “control zone” defined as 500 meters from the Ahafo site fences, including larval control by larvicide, covering tires of mine trucks with plastic sheets to avoid their becoming breeding sources, house screening and bed nets in all Ahafo site accommodations, and indoor spraying. Information posters are also provided throughout the site buildings to provide information on correct behavior to reduce the risk of contracting malaria.

A Malaria travel pack is provided to all visitors upon arrival to the Ahafo site.

In addition to the activities dedicated to the control of mosquitoes, education activities are also done in the nearby communities, mainly to educate in the use of bed nets and other safe behaviors against mosquitoes. NGGL also cooperate with the Ghana government program aimed at increasing the use of bed nets.

The presence of mosquitoes is determined by traps set every month to monitor the population.

The statistics show that in the period January to June 2006 an average 424 malaria cases per month were reported. In the period June to July 2007, an average 200 cases per month were reported. These cases are mostly due to employees contracting malaria outside the “control zone”, in Accra or at the villages. This high rate of occurrence suggests that the malaria control measures developed on site may be adequate to reduce risks. Additional control measures may also include reducing the possibility of mosquitoes breeding in the ECDs located outside the Ahafo site.

HIV is another health concern in Ghana. An HIV/AIDS program, mainly addressed to community education and distribution of condoms to prevent the spread of HIV/AIDS, has been developed as part of NGGL’s community health program.

Although the general hygiene in the site was not evaluated in detail during the visit, the ECMG observed good housekeeping and clean conditions in common areas, including canteen, pub, etc..

<i>IFC Policy Action Item</i>

Nil

<i>ESIA Action Item</i>

Nil

Recommendations for Improvement:

- i) NGGL needs to make sure that the statistics reflect the different groups working on site (nationals and expatriates) to evaluate the effectiveness of malaria control procedures (*repeat recommendation*).
- ii) The Project should collect data and provide scientific evidence that the ongoing operations and associated facilities do not create breeding grounds for mosquitoes and other disease vectors (*repeat recommendation*).

4 Cultural Resource Management

4.1 Cultural Resource Management Surveying and Planning

Project Strategy:

The ESIA defines NGGL's commitment for cultural resource management to be World Bank Operational Policy 4.11, *Safeguarding Cultural Property in an IFC-Financed Project*. Actually, the title of OP 4.11 is "Physical Cultural Resources" and the appropriate reference is OPN 11.03 "Management of Cultural Property in Bank-Financed Projects", which is an international best management practice that requires developers to identify and preserve archaeological (prehistoric), paleontological, historical, religious resources, and unique natural features. The IFC currently supplements OPN 11.03 with Performance Standard 8, Cultural Heritage dated April 30, 2006. As part of the ESIA preparation process, a survey entitled "Newmont Ghana Gold Limited, Cultural Heritage Survey at Ahafo, Ahafo Gold Project, Reference – B333, Version 1.0 dated March 2005" was prepared by SGS Environment. The survey identified 18 sites including cemeteries, shrines, water bodies, a tree, and a hill. Subsequent to this survey, a Cultural Resource Management Plan dated August 2006 was prepared. This document references IFC Performance Standard 8.

Observations:

The December 2006 ECMG report identified a deficiency in terms of the evaluation of cultural resource management. Cultural resource management has been conducted to the point of identifying sacred sites of community significance (e.g., cemeteries, religious shrines, sacred landmarks, etc.), but archaeological surveys were not conducted as part of the baseline surveys. This situation has not changed, although topsoil stripping activities are ongoing. Archaeological resources are essentially unknown in the site area. Nevertheless, archaeological resources may be present and their potential discovery through an adequate baseline could substantially enhance the cultural record of Ghana and end up as a positive contribution by the project, if appropriate actions are taken.

The Cultural Resource Management (CRM) Plan prepared in August 2006 provides general guidelines for the identification of cultural properties and indicates that work will stop and appropriate procedures followed if chance finds are encountered. This document provides basic procedures for the management of cultural resources. There is a general requirement for archaeological follow-up, stated as follows: "*The CRM will ensure that all archaeological collections and associated records are processed, maintained and preserved. The CRM will negotiate a curation agreement with a national repository, museum, university, or other approved facility for final curation of artifact collections and associated records removed from land controlled by NGGL. Contracts for conducting archaeological surveys or excavations will include a provision for curation of collected artifacts.*"

The requirements for archaeological baseline surveys prior to ground disturbing within the CRM Plan is as follows: "*Prior to any ground disturbing activities an inventory of all cultural heritage sites and exclusion zones will be located using GPS equipment and photographed (when permissible).*" This requirement is appropriate as a general commitment, although it omits defining the work that would be required of archaeologists prior to making an inventory.

As a basic observation, the lack of an archaeological baseline survey is a significant deviation from what is considered to be “best practice” and with IFC policy. Archaeologists should be involved as soon as practical, considering that new regional environmental baseline studies are ongoing. Archaeology is a standard component for baseline studies for any major development project.

From the information provided, it is understood that archaeological baseline surveys will commence in the 4th Quarter 2007.

IFC Policy Action Items

M1.18 Include and implement archaeology baseline survey within the scope of the cultural resource management surveys that should be undertaken as part of environmental baseline surveying.

ESIA Action Item

Nil

Recommendations for Improvement:

- i) The CRM plan should cover the types of archaeological materials that might be encountered and what workers should look for, field procedures for chance archaeological finds, notification protocols, procedures for inventory, excavation, interpretation and curation, and reporting requirements.
- ii) Consider to obtain resources for archaeological programs from the University of Ghana, which has an archaeological department.

5 Tailings Storage Facility (TSF)

5.1 Design and Construction Update

Project Strategy:

The TSF was designed by Knight Piésold Pty Ltd (KP) in 2004. The design of the tailings pumps, pipework and return water system were carried out by Lycopodium Engineering Pty Ltd (Lycopodium). Construction management is currently being conducted by Knight Piésold.

The TSF has been started as a single main embankment at the south end of the Subri River (South Embankment). The upstream limit to tailings deposition is the Water Storage Facility (WSF) dam (North Embankment). The facility is planned to ultimately comprise a four-sided main embankment constructed in annual stages over 11 years utilizing mine waste rock and, if necessary, fill from designated borrow areas. The plans for final completion of the TSF are not yet finalized, pending decisions yet to be made for mining associated with the Ahafo North area. The TSF is operated as a “zero discharge” facility, with all water returned for use in the ore processing circuit, and no water discharged to the environment.

The basic design characteristics of the TSF are tabulated in the December 2006 report and are not repeated here. The applicable and relevant IFC guideline is the OP 4.37 (draft) on Safety of Dams (September 1999).

Observations:

The tailings dam appears to be designed and constructed within the established design parameters. As noted in the December 2006 report, the design criteria are based on the hazard classification of the TSF, which is classified as “significant” according to ICOLD (International Committee on Large Dams) Guidelines, where there are three classifications: low, significant and high. Dams assigned the significant or medium hazard potential classification are those dams where failure or mis-operation results in no probable loss of human life, but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns. The basis for the “significant” classification for the Ahafo TSF is not provided in either the ESIA or the Operating Guidelines for the TSF, and should be clarified, since the designation of the degree of hazard for the impoundment has significant implications in terms of what is considered to be “best practice” for design and operations.

The explanation provided by NGGL with respect to the basis of the dam classification is that fewer than 100 people live downstream of the dam such that the dam does not to be considered as a high hazard facility. The ECMG notes that the ICOLD classification does not consider how many people live downstream who could be adversely affected and NGGL has not provided any maps such that the potential number of affected individuals can actually be determined.

IFC Policy Action Items

Nil

ESIA Action Items

Nil

Recommendation for Improvement:

- i) It is strongly recommended that NGGL comprehensively justify the hazard classification of the TSF. A best practice approach should involve an evaluation to determine the potential human and environmental impacts of a dambreak event. See also recommendations for emergency action planning (*repeat recommendation*).

5.2 Operations and Maintenance Planning*Project Strategy:*

At the time of the December 2006 ECMG visit, a document entitled “*Ahafo Project, Tailings Storage Facility, Operations Manual*” had been prepared for the TSF, as required by the IFC guideline OP 4.37 on Safety of Dams. This manual described the design in detail and presents operational and emergency procedures for the management of the facility. This document has been supplemented by a revised document entitled “*Ahafo Mine, Tailings Management Plan*” dated March 2007, which overlaps with the “*Operations Manual*.”

Observations:

The Tailings Management Plan was presented to the ECMG as a pre-draft document, but it does cover the basic requirements for tailings management as previously noted in the ECMG December 2006 report, including:

- Measuring water content and particle size distribution of the tailings;
- Freeboard measurement of the dam wall, and water level measurement at the spillway or the decant tower;
- Monitoring rainfall and evaporation;
- Frequent periodic measurements of pore pressure in the dam, documentation of dam movements with instrumentation/measurements;
- Quantity of tailings deposited and volumes of water decanted; and
- Periodic (at least annual) of the wind and water erosion of the tailings facility.

In terms of fulfilling the requirements of an Operations Manual, the Tailings Management Plan is consistent with good practice and IFC requirements.

It is common that the management of a tailings facility be founded on the basis of a quantitative risk analysis. In the ESIA, Chapter 2 it is indicated that “*NGGL will conduct a site-specific risk assessment to determine the level of risk posed by the design and operation of the Ahafo South Project.*” The risk assessment for the deposit (failure modes, effects and sensitivity analysis) was carried out in 2005 and the Tailings Management Plan indicates that the risk assessment should be updated annually at the time of the annual audits in open forum with mine management present. All mitigation measures should be recorded in the incident or objectives list with nominated forum at time period specified. The only information provided to ECMG (provided during the December 2006 mission) is that the only formal risk assessment has been conducted for potential impacts to wildlife.

<p><i>IFC Policy Action Items</i></p>

<p>Nil</p>

<p><i>ESIA Action Items</i></p>

<p>M2.5 Conduct (and update) a complete risk assessment (i.e., not limited to potential impacts to wildlife) to evaluate all processes associated with the construction and operations of the TSF to all environmental and human receptors.</p>

5.3 *Emergency Action Planning*

Project Strategy:

The Project description for the TSF states the following commitment: “*The tailing storage facility will be state-of-the-art using rotational, subareal tailing deposition and designed, constructed, and operated in accordance with Newmont’s Standards for Tailing Management and relevant sections of the Ghana Minerals and Mining Law, 1986, Ghana Mining Environmental Guidelines, Final Draft, 1994; State of Nevada (U.S.) Administrative Code Chapter 445A, which governs design, construction, operation and closure of mining facilities; and IFC Operational Policy 4.37.*”

Observations:

It is recognized that the TSF has a very low probability of failure, but “good practice” procedures require consideration of the consequences of the release of tailings as also generally defined by IFC requirements.

The typical means to determine the contents of an Emergency Action Plan (or Emergency Preparedness Plan) is to conduct a risk assessment to identify potential failure modes and then determine the potential consequences of the failure(s). The results should be the identification (on a map) of potential human and environmental receptors that could be impacted. Should the results indicate that the human or environmental consequences are potentially severe, it may be necessary to revisit the hazard classification of the TSF.

IFC Policy Action Items

M1.19 Prepare an Emergency Action Plan (or Emergency Preparedness Plan) for the potential failure of the TSF that clearly defines potentially affected areas based on potential release scenarios as determined on the basis of a risk assessment and contains notifications and chain-of-command procedures. Environmentally sensitive areas and receptors should also be identified on the maps of areas with potential impact.

ESIA Action Items

Nil

Recommendations for Improvement:

- i) Involve the HSLP group with the emergency planning for the TSF facility (*repeat recommendation*).

List of Acronyms and Abbreviations

ARD: Acid Rock Drainage
BAPP: Biological Acid Production Potential
BBOP: Business and Biodiversity Offsets Program
BMP: Biodiversity Management Plan
BOD: Biological Oxygen Demand
CI: Conservation International
COD: Chemical Oxygen Demand
CRM: Cultural Resource Management
EAP: Environmental Action Plan
EAP: Emergency Action Plan
ECD: Environmental Control Dams
ECMG: External Compliance Monitoring Group
EHS: Environmental Health and Safety
ESIA: Environmental and Social Impact Assessment
EMIS: Environmental Management Information System
EPA: Environmental Protection Agency
EPP: Emergency Preparedness Plan
ERP: Emergency Response Plan
ESAP: Environmental and Social Action Plan
GSHAP: Global Seismic Hazard Assessment Program
H&S: Health and Safety
HSLP: Health, Safety and Loss Prevention
ICMC: International Cyanide Management Code
IFC: International Finance Corporation
JHA: Job Hazard Analysis
L&D: Learning and Development
LTA: lost time accident
MCE: Maximum Credible Earthquake
MSDS: Material Safety Data Sheet
NGGL: Newmont Ghana Gold Limited
NGO: Non-Governmental Organization
OWS: Oil/Water Separator
PMF: Probable Maximum Flood
PPE: Personal Protective Equipment
QA/QC: Quality Assurance/Quality Control
SOP: Standard Operating Procedure
SPLP: Synthetic Precipitation Leachability Procedure
SSV: Senior Staff Village
STP: Sewage Treatment Plant
STD: Sexually Transmitted Disease
TSF: Tailings Storage Facility
TSS: Total Suspended Solids
WAD: Weak Acid Dissociable
WSF: Water Storage Facility
WB: World Bank
WHO: World Health Organization