AFGRI Poultry (Pty) Ltd

EMPr

Locality: Delmas

Departmental Ref No: 12/9/11/L875/6

SHANGONI
Management Services (Pty) Ltd

ENVIRONMENTAL MANAGEMENT PROGRAMME

AFGRI Poultry (Pty) Ltd.

EMPr

Locality: Delmas

Departmental Ref No: 12/9/11/L875/6

Unit C8
Block @ Nature
472 Botterklapper Street
Pretoria

Office: (012) 807- 7036
Fax: (012) 807 1014

PROJECT DETAILS

National Department of Environmental Affairs

Reference No.: 12/9/11/L875/6

Project Title: AFGRI Poultry Delmas Abattoir Wastewater Treatment Works

Project Number: AFG/del/11-08-11

Compiled by: Ms. Lizette Crous

Date: 12 February 2013

Location: Portion 21 of the farm Geluk 234 IR, Delmas

Technical Reviewer: Lourens de Villiers

Signature

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1. Introduction

The AFGRI Delmas abattoir was built by Rossgro Chickens (Pty) Ltd. a number of years ago and became the property of AFGRI Operations Limited when they bought the Rossgro Chickens business at the beginning of 2011.

At present, 360 000 chickens are slaughtered at the abattoir per week. The abattoir operates 24 hours a day, 7 days a week. Abattoir wastewater has a high organic content due to the waste materials (blood, fat, small pieces of meat, gizzard contents, urine and dung) produced in the slaughtering process. The current wastewater treatment process at the abattoir was re-evaluated and found to be inadequate for the current operation and any future expansions to the abattoir. To adequately treat and re-use the abattoir wastewater, an integrated ponding and artificial wetland system is being proposed.

This Environmental Management Programme (EMPr) document describes mitigation measures that need to be implemented during the construction- and operational- phases of the proposed project: AFGRI Poultry Delmas Abattoir Wastewater Treatment Works WWTW.

The EMPr is applicable to the entire abattoir and WWTW area to ensure environmental control for all aspects of the project is implemented throughout the project area. The responsibility for the implementation of this EMPr on site is the responsibility of the appointed abattoir manager, but must be enforced by Mr. Willem Breedt and the Environmental Control Officer (ECO).

The EMPr should also be viewed as a dynamic document. Methods should be updated and improved during implementation, as site conditions become clearer and material or methods improve. The EMPr attempts to provide the most practicable methods to promote sound environmental management during the lifespan of the project.

The environmental management programme (EMPr) should be kept on file in the office. The mitigation measures indicated in this Environmental Management Programme must be implemented by all the site workers and contractors.

2. Environmental Assessment Practitioner

Name of firm	Shangoni Management Services (Pty) Ltd.	
Postal address	PO Box 74726 Lynwood Ridge Pretoria 0040	
Telephone No.	(012) 807 7036	
Fax	(012) 807 1014/086 643 5360	
E-mail	lizette@shangoni.co.za	
Team of Environmental Assessment Practitioners on project		
Name	**Qualifications**	**Responsibility**
Mr. H.L. de Villiers	Bsc. (Hons) (PU for CHE) MSc.(UP)	EIA Project Leader and Co-ordinator
Ms. Lizette Crous	Post Graduate Certificate Environmental Management (University of London)	EAP
Ms. Patricia van der Walt	B.Sc. (Hons) (Applied Science in Environmental Technology)	EAP

Detailed CV's for the project team are appended.

3. Site Documentation

The following documentation must be available at the construction site office at all times:

- A copy of the Environmental Impact Assessment Report.
- A copy of the Environmental Management Programme (EMPr).
- A copy of the Environmental Authorisation.

4. Legislation

4.1 Laws of general application

- Constitution of the RSA, 1996 (Act No 108 of 1996);
- National Environmental Management Act, 1998 (Act No 107 of 1998);

- Environment Conservation Act, 1989 (Act No 73 of 1989);
- Promotion of Access to Information Act, 2000 (Act No 2 of 2000);
- Protected Disclosures Act, 2000 (Act No 26 of 2000).

4.2 Atmospheric emissions

- Atmospheric Pollution Prevention Act, 1965 (Act No 45 of 1965);
- National Building Regulations and Building Standards Act, 1977 (Act No 103 of 1977);
- Environment Conservation Act, 1989 (Act No 73 of 1989) – Noise Control Regulations in terms of Section 25 of the Environment Conservation Act, 1989;
- National Environmental Management Act, 1998 (Act No 107 of 1998).

4.3 Water Management

- National Water Act, 1998 (Act No 36 of 1998).

4.4 Hazardous Chemicals and Substances

- Hazardous Substances Act, 1973 (Act no. 15 of 1973);
- National Road Traffic Act, 1996 (Act no. 83 of 1986) – GN R225 of 17 March 2000 – National Road Traffic Regulations, 2000;
- Occupational Health and Safety Act, 1993 (Act No 85 of 1983) – GN 1179 of 25 August 1995 – Regulations for Hazardous Chemical Substances (HCS).

4.5 Waste Management

- National Environmental Management: Waste Act (NEMWA) No 59, of 2008;
- Environment Conservation Act, 1989 (Act No 73 of 1989);
- National Road Traffic Act, 1996 (Act No 93 of 1996) – GN R225 of 17 March 2000 – National Road Traffic Regulations;
- Hazardous Substances Act, 1973 (Act No 15 of 1973);
- Occupational Health and Safety Act, 1993 (Act No 85 of 1993) – GN 1179 of 25 August 1995 – Hazardous Chemical Substance Regulations.

4.6 Planning of new activities

- Development Facilitation Act, 1995 (Act No 67 of 1995);
- National Environmental Management Act, 1998 (Act No 107 of 1998).

4.7 Biodiversity

- National Environmental Management Biodiversity Act, 2004 (Act No 10 of 2004);
- Conservation of Agricultural Resources Act, 1983 (Act No 43 of 1983);
- National Veld and forest fire Act, 1998 (Act No 101 of 1998);
- Agricultural Pest Act, 1983 (Act No 36 of 1983) – GN R276 of 5 March 2004;
- Fencing Act, 1963 (Act No 31 of 1963);
- National Forest and Fire Laws Amendment Act (Act No 12 of 2001).

4.8 Land and Soil Management

- National Environmental Management Act, 1998 (Act No 107 of 1998);
- Environment Conservation Act, 1989 (Act No 73 of 1989).

4.9 Heritage Resources

- National Heritage Resources Act No 25 of 1999 (Act No 25 of 1999).

4.10 Protected areas

- National Environmental Management: Protected Areas Act, 2003 (Act No 57 of 2003).

During the course of the development, the developer and contractors must comply with all other relevant legislation (including the bylaws of the Victor Khanye Local Municipality).

5. Environmental Management Programme

Refer to the tables below for the EMPr. In the tables below, responsibility is assigned to the relevant parties, keeping in mind that AFGRI Poultry are ultimately still responsible for ensuring implementation of the EMPr. The EMPr must be updated should any significant changes occur to the operations at the wastewater treatment works.

5.1 Planning and design phase

Table 1: EMPr - Planning and design phase

Activity	Aspect	Impact	Objective	Management/ Mitigation Measure	Monitoring compliance	Timeframes	Responsible Party
Designing of the WWTW	Seepage of wastewater and accumulation of surface water	Formation of sinkholes and doline	To prevent the formation of sinkholes and doline	• The design and construction of the WWTW must take cognizance of the presence of dolomite in close proximity to the site. • All WWTW ponds must be lined with HDPE to prevent seepage of wastewater into the ground.	AFGRI Poultry should ensure that the WWTW design conforms to the required management/ mitigation measures	Complete prior to construction phase	• WWTW designer • Engineer • Geologist
Designing of the WWTW	Inefficient treatment of abattoir wastewater	Soil-, surface water- and/or groundwater-pollution	To prevent pollution of the environment	• The WWTW must be designed to effectively treat the abattoir wastewater to a quality that complies with the Department of Water Affairs' General Limit standards for discharge into a water resource.	AFGRI Poultry should ensure that the WWTW design conforms to the required management/ mitigation measures	Complete prior to construction phase	• WWTW designer
Designing of the WWTW	Inefficient and/or redundant use of electricity	Wastage of electricity	To prevent the unnecessary use of electricity	• The WWTW must be designed to use as little electricity as possible. • Gravity flow between the various WWTW ponds must be used as far as possible. The use of electricity to pump wastewater between the ponds will thereby be limited.	AFGRI Poultry should ensure that the WWTW design conforms to the required management/ mitigation measures	Complete prior to construction phase	• WWTW designer

5.2 Pre-Construction and Construction Phase

Table 2: EMPr - Pre-Construction and Construction Phase

Activity	Aspect	Impact	Objective	Management/ Mitigation Measure	Monitoring compliance and reporting	Timeframes	Responsible Party
Construction activities	Incorrect drainage, surface water accumulation and seepage	Sinkhole and doline (compaction subsidence) formation	• Prevent the formation of sinkholes and doline. • Minimise the disturbance of the local geology through effective prevention measures	• Effective construction practices and planning. • Working within the design plan. • Normal drainage precautionary measures and special installation measures for underground wet services, applicable for dolomite terrain and in compliance with the requirements of the local municipality, must be adhered to. This will ensure that no significant accumulation of surface water occurs as a result of inadequate storm water canalization. Poor water control is unacceptable. • A competent person must inspect all foundation excavations. • The placement of engineered fills must be controlled with suitable field tests to ensure that the required densities are achieved during compaction and that the quality of the fill material is within specification. Chemical stabilization or mechanical modification of the soil may improve its compaction strength. • All wastewater containment ponds and artificial wetland cells must be lined with a 1.5mm HDPE liner. • Any buried pipes must be plastic or non-ferrous due to the potentially chemically aggressive nature of the	ECO to verify implementation of mitigation measures proposed in this EMPr. ECO to submit monthly compliance reports to competent authority	During the construction phase. Must be completed by the end of the construction phase	• Construction contractor • Engineers

Activity	Aspect	Impact	Objective	Management/ Mitigation Measure	Monitoring compliance and reporting	Timeframes	Responsible Party
			during the construction activities. • Ensure that the geotechnical features of the site are taken into account in order to prevent any impact on structures to be built.	foundation materials.			
Construction activities	Lack of environmental knowledge among employees	Harm to the environment due to workers or contractors being unaware of how their activities may impact the environment or due to unauthorised access to the site	Prevent harm to the environment through the actions of uneducated workers or contractors	• The requirements of this Environmental Management Programme will be implemented by all the site workers and contractors. • The contractor is to ensure that all employees, including sub-contractors and their employees, attend on-site Environmental Awareness Training prior to commencing work on site. • Follow-up Environmental Awareness Training may be required from time to time as new subcontractors or crews commence work or for specific activities that may potentially impact the environment, or if work is being undertaken in sensitive environments. • The contractor is to maintain accurate records of any training undertaken. • Training is to cover all aspects of the EMPr, procedures to be followed, the sensitivity of the site and importance of adhering to “no-go” areas. • The ECO shall monitor the contractor’s compliance with the requirement to provide sufficient environmental awareness training to all site staff. • Environmental signage is to be displayed on the site including – “no smoking”, “fire hazards”, etc. • Emergency numbers are to be clearly displayed. • Major emergency incidents that may cause danger to the public or environment, including pollution of a water resource, must be reported as per the requirements of Section 30 of the National Environmental Management Act, 1998, and Section 20 of the National Water Act, 1998. • All construction workers shall be issued with ID badges and clearly identifiable uniforms. • All construction workers shall be transported to and from site on a daily basis. • Workers shall remain on the site at all times during the work day and no one will be allowed to leave site by foot, not even during break times. • Night watchmen are to be provided with adequate cooking and heating facilities (no open fires), a suitable method of disposing of wastewater, and access to communication equipment. • Access to fuel and other equipment stores is to be strictly controlled. • It is the responsibility of the site workers as well as the contractors to ensure that the site is kept neat and tidy.	ECO to verify implementation of mitigation measures proposed in this EMPr. ECO to submit monthly compliance reports to competent authority	During the construction phase. Must be completed by the end of the construction phase	• Construction contractor
Clearance of site and excavation work	Careless site clearance and excavation work	• Destruction of heritage resources or archaeological remains	• Conserve any heritage resources or archaeological remains	• If any archaeological remains or other heritage resources are exposed during the construction phase, the construction must be terminated immediately and the South African Heritage Resources Agency (SAHRA) must be contacted. In this regard, the applicant must take note of the requirements in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999).	The construction contractor and WWTW manager must be present on site during excavation work	During the construction phase	• Construction contractor
Clearance of site and other construction activities	Removal of vegetation (crops)	• Loss of degraded vegetation during site clearance • Destruction or loss of natural vegetation in No-Go Areas	• Minimise the loss of degraded vegetation, natural vegetation, habitats for indigenous vegetation and	• Before any construction takes place the proposed area for the WWTW will be pegged out. All construction activities will be limited to these areas in order to reduce the footprint of the proposed activity and avoid impact on adjacent disturbed areas and nearby wetlands. • Construction areas should be fenced off or barricaded prior to and during construction. • Delineated wetland areas must be designated as “No-go areas”, avoided and conserved. • Effective planning of the construction operations. • Site clearing is to be limited to only the area necessary for carrying out the specified works. • Alien and invasive plant species, including exotic weeds, must be eradicated. • The contractor is to draw up a plan for submission to the ECO and the site manager indicating the locations of	ECO to verify implementation of mitigation measures proposed in this EMPr. ECO to submit monthly compliance reports to competent authority	During the construction phase. Must be completed by the end of the construction phase	• Construction contractor

Activity	Aspect	Impact	Objective	Management/ Mitigation Measure	Monitoring compliance and reporting	Timeframes	Responsible Party
		(wetlands) • Destruction of natural habitat for indigenous fauna • Destruction of a natural carbon sink • Disturbance of the wetlands (watercourse)	natural carbon sinks. • Minimise the disturbance of wetlands	construction infrastructure including the site-camp, equipment cleaning pits, toilets, stores, site office, and "no-go" areas. • The "no-go" areas are to be demarcated with a wire and danger-tape temporary barrier fence attached to planted posts (wooden or metal) at a minimum. This can be in the form of two strands of wire 500mm apart on droppers of 3m spacing, with danger tape zigzagged between the wires. • The site boundary is to be clearly demarcated and screened from the commencement of works. The erection of the final boundary fence or wall is preferable. • All demarcation is to be regularly maintained. • No unauthorised entry, stockpiling, dumping or storage of equipment in "no-go" areas, or outside the site boundary is permitted. • All construction activities, plant, labour and materials are to be restricted within the site boundary. • Should the only means of completing specified work be to enter "no-go" areas, authorisation must be provided in writing by the ECO. • Search and rescue (if necessary) is to take place prior to commencement of work on site. • Removal of vegetation is to be avoided until such time as soil stripping is required. • Should construction in areas that have been stripped not commence within a short period of time the exposed areas shall be re-vegetated or stabilised. Soil stabilising measures could include rotovating in straw bales (at a rate of 1 bale/20m^2), applying mulching or brush packing, or creating windbreaks using brush or bales. • Disturbed areas should be rehabilitated once the construction activities have ended. Only indigenous plant species should be planted.			
Stockpiling of topsoil and cleared vegetation	Topsoil exposed to the elements	• Loss of valuable topsoil due to inadequate stockpiling practices • Outbreak of fires • Erosion of cleared areas	Ensure the proper management of topsoil and minimise erosion of cleared areas	• Before any construction takes place the proposed area for the WWTW will be pegged out. All construction activities will be limited to these areas. • Topsoil (top 150mm) is to be stockpiled in demarcated areas and retained for future landscaping efforts. • Topsoil stockpiles shall not exceed 1m in height and 2m in width and shall be protected from wind, erosion and runoff by covering with a suitable fabric approved by the ECO. Once earthworks are complete, disturbed areas are to be re-vegetated or rehabilitated. • The contractor is to ensure that all reasonable measures are taken to limit erosion and sedimentation from construction activities. Erosion protection measures include cut-off drains and/or berms. • Any sub-soil or rocks removed should also be stockpiled (separate from topsoil) and be used during the rehabilitation. • Topsoil stockpiles should be monitored for the growth of invasive plant species. These should be removed if observed. • Basic fire-fighting equipment (e.g. fire extinguishers) must be available near stockpiles. • Once the construction activities have been completed, the remaining disturbed area must be top soiled, sloped and re-vegetated as soon as possible using suitable grass species. This re-vegetation will assist in reducing the potential of erosion. If sterilization of the topsoil during stockpiling has occurred, inorganic fertilizers will be used to supplement the soils before seeding of the area takes place. Compacted soil should be ripped to ensure effective re-vegetation.	ECO to verify implementation of mitigation measures proposed in this EMPr. ECO to submit monthly compliance reports to competent authority	During the construction phase. Must be completed by the end of the construction phase	• Construction contractor
Construction activities	Runaway veldt fires	Disturbance of vegetation surrounding the proposed site as a result of runaway veldt fires caused by workers or contractors	Prevent the occurrence of avoidable veldt fires	• Basic fire-fighting equipment is to be placed at strategic locations on site (e.g. at the site office, flammable material store and watchman's container). • Equipment is to be maintained in good working order to the satisfaction of local fire authorities. • No open fires are permitted. A dedicated braai facility may be permitted in an area approved by the ECO, if the campsite is in close proximity to firefighting equipment. At no time is a braai fire to be left unattended. • Smoking is prohibited near places where any readily combustible or flammable materials are present. Notices are to be prominently displayed prohibiting smoking in such areas. • Welding, flame cutting and other hot work is only to be undertaken in places where the necessary safety precautions are in place (i.e. not near potential sources of combustion and with a fire extinguisher immediately accessible). • All flammable materials are to be stored in a suitable, lockable storage area. • Combustible materials may not accumulate on the construction site. • Cooking is to be restricted to bottled gas facilities in designated areas approved by the ECO. This facility is to be supervised and strictly controlled.	ECO to verify implementation of mitigation measures proposed in this EMPr. ECO to submit monthly compliance reports to competent authority	During the construction phase. Must be completed by the end of the construction phase	• Construction contractor

Activity	Aspect	Impact	Objective	Management/ Mitigation Measure	Monitoring compliance and reporting	Timeframes	Responsible Party
				• Fire extinguishers must be readily available.			
Storage, mixing and disposal of cement and concrete	Concrete and cement spillage	Water- and/or soil- pollution	Prevent the contamination of soil and water as a result of concrete and cement used on site	• No mixing of concrete or cement directly on the ground is permitted. The mixing of concrete will only be done on mortarboards (dugga-boards). • Ready-mix trucks are not permitted to clean chutes on site. Cleaning into foundations or a dedicated cleaning pit is permitted. • Both used and unused cement bags are to be stored in weatherproof containers so as not to be affected by rain or runoff. • Contaminated soil resulting from concrete or cement spills, including residue produced by the washing of cavities, is to be removed immediately after the spillage has occurred and placed on the appropriate rubble stockpile. • Runoff from the washing out of wall cavities is to be contained against the building by excavations of berms around the foundations.	ECO to verify implementation of mitigation measures proposed in this EMPr. ECO to submit monthly compliance reports to competent authority	During the construction phase. Must be completed by the end of the construction phase	• Construction contractor
Cleaning of vehicles, equipment and construction areas	Wash water runoff	Soil-, surface water- and ground water-contamination	Prevent the contamination of the soil, surface water and ground water as a result of polluted wash water	• No washing of vehicles or equipment is permitted on site. • Cleaning of equipment is to take place within designated areas. • A dedicated cleaning area is to be installed to facilitate washing of all cement and painting equipment. The cleaning area could be a plastic lined cleaning pit or dedicated plastic or metal drums, located as close as possible to a water point or within reach of a hose no longer than 10m. • No wastewater may be disposed of on site, onto the soil or into any water body. • Soil contaminated with hazardous substances, fuel or oil shall be treated as hazardous waste and removed from site.	ECO to verify implementation of mitigation measures proposed in this EMPr. ECO to submit monthly compliance reports to competent authority	During the construction phase. Must be completed by the end of the construction phase	• Construction contractor
Generation, storage and disposal of hazardous waste	Poor waste management	Pollution of soil-, surface water- and ground water	Prevent soil-, surface water- and ground water-contamination due to hazardous substances	• Equipment and vehicles are to be repaired immediately upon developing leaks. Drip trays shall be supplied for all repair work undertaken on machinery on site. • Drip trays are to be utilised during daily greasing and re-fuelling of machinery and to catch incidental spills and pollutants. • Drip trays are to be inspected daily for leaks and effectiveness and emptied when necessary. This is to be closely monitored during rain events to prevent overflow. Oil and diesel spills are considered hazardous. Disposal of such contaminants should be done by following the recommended steps. • Appropriate equipment to deal with fire or pollution incidents is to be readily available on site. This includes fire extinguishers, spill kits for hydrocarbon spills, drip trays for plant or machinery leaks, drums or containers for contaminated water and drip trays for minor hydrocarbon spills. • Soil contaminated with hazardous substances, fuel or oil shall be treated as hazardous waste and removed from site.	ECO to verify implementation of mitigation measures proposed in this EMPr. ECO to submit monthly compliance reports to competent authority	During the construction phase. Must be completed by the end of the construction phase	• Construction contractor
Production, storage and disposal of general waste and building rubble	Poor waste management	Soil-, surface water- and ground water-contamination	Prevent soil-, surface water- and ground water-contamination due to general waste produced	• A construction refuse collection structure shall be erected on commencement of construction work within the boundaries of the site. The minimum requirement is as follows: ▪ 4 ready-fence panels (3m x 1.8m) covered with shade cloth or hessian, one panel being movable to provide access. The structure shall have a roof (ready fence panel, or similar) to contain waste materials in windy conditions. The floor shall be lined with HDPE plastic to prevent ground contamination from leachate such as cement powder residue or empty chemical or paint containers. ▪ Alternatively, refuse skips can be used but also need to be covered with shade cloth to ensure the containment of waste. • Refuse bins shall be provided for domestic waste (such as lunch litter) and placed in designated eating areas and any other areas where deemed necessary to control littering. • Refuse bins are not to overflow and are to be emptied regularly. No littering is permitted on site. • Building rubble is to be kept separate from other construction waste. Rubble is to be kept clean of brick ties, plastics, papers and cement bags at all times. • Rubble stockpiles and refuse structures shall be positioned to permit easy access by removal trucks. • Accumulation of large stockpiles of rubble and waste is not permitted. Waste is to be removed at regular intervals at a minimum frequency of once a week. • All waste is to be disposed of at approved landfill sites, no burning or burying is permitted. • The contractor shall delegate a specific waste management job description to an individual or team if directed by the ECO.	ECO to verify implementation of mitigation measures proposed in this EMPr. ECO to submit monthly compliance reports to competent authority	During the construction phase. Must be completed by the end of the construction phase	• Construction contractor
Construction activities and vehicles travelling to	Dust generation	• Generation of dust as a result of	Prevent the generation of dust and nuisance	• To reduce the potential for dust generation, the clearance of vegetation should be limited where possible. • All areas impacted by construction shall be regularly maintained including roads and pavements. • The contractors will be required to take appropriate measures to minimise the generation of dust as a result of their work.	ECO to verify implementation of mitigation measures proposed in this EMPr.	During the construction phase. Must be completed	• Construction contractor

Activity	Aspect	Impact	Objective	Management/ Mitigation Measure	Monitoring compliance and reporting	Timeframes	Responsible Party
and from the site		cleared vegetation and from the increase in vehicle frequency • Nuisance due to dust generated		• Dust suppression should be practiced, where possible, especially during windy conditions. • A dustcart needs to be onsite to water down dusty roads on dry windy days. • Speed bumps or traffic speed signs need to be erected to reduce speeding onsite that could result in the generation of dust. • Regular maintenance of vehicles to address wear of tires and breaks. Optimal engine combustion will allow for 'cleaner' exhaust emissions. • A complaints register must be kept on site. The complaints register must record the following: date when complaint was received, name of person who reported the complaint and when and how the concern was addressed.	ECO to submit monthly compliance reports to competent authority	by the end of the construction phase	
Increased traffic frequency on road infrastructure	• Wear of access roads • Insufficient vehicle inspections	• Accidents on access roads • Unpermitted transport of materials • Loss of materials being transported on the access roads	Minimise the impact of construction activities on the immediate and surrounding natural and social environment and prevent contamination resulting from construction activities	• Ensure that all construction vehicles using adjoining roads are roadworthy. • All areas on site impacted by construction shall be regularly maintained, including roads and pavements. • All loads are to be securely fastened when being transported. • All vehicles are to adhere to the tonnage limitation and acquire a permit as required. • All speed limits and other traffic regulations on the public roadways must be adhered to.	ECO to verify implementation of mitigation measures proposed in this EMPr. ECO to submit monthly compliance reports to competent authority	During the construction phase. Must be completed by the end of the construction phase	• Construction contractor • Transport contractors
Utilisation of water	Inefficient and/or redundant use of a valuable resource	Wastage of water and depletion of water resource	Prevent the wastage of a natural resource	• Any buried pipes must be plastic or non-ferrous due to the potentially chemically aggressive nature of the foundation materials. • Leaking water taps and hosepipes are to be repaired immediately. • Running water taps and hosepipes are not to be left unattended. • Unused water standpipes are to be buried to prevent damage and resultant water leaks. • Taps are to be attached to secured supports and used in preference to standpipes with no valve mechanism to open and close water supply. All hose and tap connections are to be fitted with correct and appropriate plumbing fittings.	ECO to verify implementation of mitigation measures proposed in this EMPr. ECO to submit monthly compliance reports to competent authority	During the construction phase. Must be completed by the end of the construction phase	• Construction contractor
Installation and use of ablution facilities	Unsanitary conditions on site	Surface- and ground- water contamination and potential soil contamination	Prevent the contamination of the soil, surface- and ground-water	• Sufficient ablution facilities shall be provided – minimum of 1 toilet per 15 workers. • Plumbed facilities are preferred. Chemical facilities are to be serviced regularly. • Toilets should have properly closing doors and supplied with toilet paper. • The location of toilets is to be approved by the ECO prior to site establishment, but shall be located within 100m of any work point. • Toilets may not be located within delineated wetland zones. • Chemical toilets are to be serviced weekly. The contractor is to ensure that no spillage occurs and that the contents are removed from site according to approved methods. • Chemical toilets are to be emptied prior to temporary site closure for a period longer than 4 days. • Only the use of ablution facilities will be permitted onsite.	ECO to verify implementation of mitigation measures proposed in this EMPr. ECO to submit monthly compliance reports to competent authority	During the construction phase. Must be completed by the end of the construction phase	• Construction contractor
Storage and handling of hazardous chemicals, including fuel	Incorrect management of hazardous chemicals	Hazardous chemical spills can cause soil-, surface water- and groundwater-pollution	Prevent or minimise soil- and water-contamination as a result of accidental spillages of hazardous chemicals used onsite	• Proper handling, storage and disposal of hazardous chemicals. All fuels and flammable materials are to be handled safely, stored safely and clearly labelled. • Flammable materials are to comply with standard fire safety regulations. • Drip trays must be used to collect spillage from equipment, vehicles and plant. These should be emptied regularly into secondary containers. • Fuels and flammable materials are to be handled in a safety conscious manner. • If refueling on site or from drums, the ground must be protected and proper dispensing equipment is to be used i.e. hand pumps and funnels. Drums may not be tipped to dispense fuel. • All fuels and flammable materials are to be stored safely and clearly labeled. • Safety signage including "No Smoking", "No Naked Lights" and "Danger", and product identification signs, are to be clearly displayed on fuel stores and tanks. • All liquid fuels (petrol and diesel) are to be stored in tanks or containers with lids and drip trays. • Fuel and flammable materials are to be kept under lock and key at all times and are to be stored at a central,	ECO to verify implementation of mitigation measures proposed in this EMPr. ECO to submit monthly compliance reports to competent authority	During the construction phase. Must be completed by the end of the construction phase	• Construction contractor

Activity	Aspect	Impact	Objective	Management/ Mitigation Measure	Monitoring compliance and reporting	Timeframes	Responsible Party
				easily accessible location. • Storage areas for fuels and flammable materials are to comply with standard fire safety regulations. • Adequate fire-fighting equipment shall be available close at hand and no smoking is permitted within the vicinity of storage areas. • All personnel handling fuels and hazardous materials are to be issued with the appropriate Personal Protective Equipment (PPE).			
Operation of construction vehicles and machinery	Generation of noise	Disturbance or nuisance to neighbors as a result of the increase in ambient noise from construction vehicles and machinery	Minimise noise generation from construction activities	• The site workers and contractors will adhere to the requirements of the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993). • The site workers and contractors must wear the necessary protective gear at all times. • Regular maintenance of vehicles and equipment. • Unused vehicles or machinery must be shut down and not left to idle. • All plant and machinery are to be fitted with adequate silencers. • Working hours should be restricted to daylight hours. • Working procedures should be structured so as to avoid the unnecessary generation of noise. • No sound amplification equipment such as sirens, loud hailers or hooters are to be used on site except in emergencies and no amplified music is permitted on site. • If work is to be undertaken outside of normal work hours permission must be obtained from the ECO and the site manager. • No noisy work is to be conducted over the weekends or on religious public holidays. • A complaints register must be kept on site. The complaints register must record the following: date when complaint was received, name of person who reported the complaint and when and how the concern was addressed.	ECO to verify implementation of mitigation measures proposed in this EMPr. ECO to submit monthly compliance reports to competent authority	During the construction phase. Must be completed by the end of the construction phase	• Construction contractor
Unlawful public access to the construction site	Public entrance into the construction site	Injury or death of unauthorised persons	Prevent public access to the construction site	• Restrict public access to the WWTW by erecting proper fencing. • Place “No Entry” signage on the perimeter fence.	ECO to verify implementation of mitigation measures proposed in this EMPr. ECO to submit monthly compliance reports to competent authority	During the construction phase. Must be completed by the end of the construction phase	• Construction contractor
The use of resources such as electricity, oil, grease, fuel and construction materials	Inefficient and/or redundant use of valuable resources	Wastage of valuable resources	Prevent the unnecessary wastage of resources	• Regular maintenance and inspection of equipment to prevent leaks. • Optimalisation of processes to reduce electricity consumption. • Regular site inspection by supervisors. • Proper environmental training and awareness.	ECO to verify implementation of mitigation measures proposed in this EMPr. ECO to submit monthly compliance reports to competent authority	During the construction phase. Must be completed by the end of the construction phase	• Construction contractor
Completion of the construction phase	Unsatisfactory implementation of mitigation measures identified in this EMPr	Environmental damage	To ensure all required mitigation measures were implemented during the construction phase	• Shortcomings must be identified and ways to address them must be identified. • All shortcomings must be addressed immediately.	A post-construction compliance audit must be conducted to ensure that any shortcomings are identified and addressed.	At the end of the construction phase, prior to commence-ment of the operational phase	• Independent environment-al auditor

5.3 Operational Phase

Table 3: EMPr - Operational Phase

Activity	Aspect	Impact	Objective	Management/ Mitigation Measure	Monitoring compliance and reporting	Timeframes	Responsible Party
Treatment of abattoir wastewater	Spillage of wastewater through leaking pipes or through seepage from treatment ponds	Groundwater contamination	Prevent the contamination of groundwater	• Spilling and leaking from the treatment ponds and wetlands should be prevented. • Integrity of the HDPE pond and wetland liners must be checked on a yearly basis. • HDPE liner damage must be repaired immediately. • Groundwater monitoring of DEBH01 and DEBH02 must be undertaken on a quarterly basis to ensure that no groundwater contamination is occurring. • Groundwater qualities should be analyzed for organic and inorganic content. • The parameters recommended for analysis are: Electrical Conductivity, pH, Total Dissolved Solids, fluoride, ammonia nitrogen, nitrate, total phosphorus, Chemical Oxygen Demand (COD), oil and grease, chloride, sodium, total alkalinity, calcium, magnesium, sodium, potassium, sulphate, iron, manganese, aluminium and turbidity. • In terms of flow, all water uses and discharges should be measured on an ongoing basis. • As far as possible, the same monitoring boreholes should be used to develop a long data record. This will enable trend analysis and recognition of progressive impacts (or improvement) with time. • The monitoring results should be interpreted on a regular basis to verify results from the geohydrological study and implement remedial action where the necessity is indicated.	• Groundwater quality monitoring on a quarterly basis • Continuous water flow measurements • Recording of results. Records must be kept on site. • Records must be compared to identify trends. • Internal audits against this EMPr must be conducted every 6 months and records kept on site. Shortcomings must immediately be addressed.	Ongoing for the life of the WWTW	• WWTW manager
Operation of vehicles	Dust generation/ accumulation	Air quality degradation and nuisance	Minimise the potential impact of dust pollution caused by vehicles and other activities onsite	• Dust suppression should be practiced, where possible, especially during windy conditions • A water bowser needs to be onsite to water down dusty roads on dry windy days. • Speed bumps or traffic speed signs need to be erected on site to reduce speeding that could result in the generation of dust. • Roads must be tarred or paved where possible. • A complaints register must be kept on site. The complaints register must record the following: date when complaint was received, name of person who reported the complaint and when and how the concern was addressed.	• Complaints register must be checked daily and complaints addressed as soon as possible. • Regular site inspection. • Internal audits against this EMPr must be conducted every 6 months and records kept on site. Shortcomings must immediately be addressed.	Ongoing for the life of the WWTW	• Abattoir and WWTW manager
Treatment of abattoir wastewater	Generation of odours	Social impact (nuisance)	Minimise the impact of odours created at the treatment plant	• Good housekeeping should be maintained. • The wastewater treatment plant must be designed, operated and maintained so as to minimise odours. • Odours produced during the commissioning phase of the treatment works can be minimised by for example using an artificial cover on the ponds that will break down over time or by laying straw or hay on the surface of the anaerobic pond. • Commercial microbial and enzyme products must be added during the commissioning phase to promote natural binding and prevent the generation of odours. • All chemicals and detergents used at the abattoir must be compatible with the bacteria used in the wastewater treatment plant. • Should system failure occur, a suitable starter culture or enzyme must be used to re-establish pond equilibriums. • A complaints register must be kept on site. The complaints register must record the following: date when complaint was received, name of person who reported the complaint and when and how the concern was addressed.	• Complaints register must be checked daily and complaints addressed as soon as possible. • Regular inspection of WWTW functioning. • Internal audits against this EMPr must be conducted every 6 months and records kept on site. Shortcomings must immediately be addressed.	Ongoing for the life of the WWTW	• WWTW manager
Storm water management	Incorrect drainage, surface water accumulation and seepage	• Sinkhole and doline (compaction subsidence) formation • Soil- and	• Prevent the formation of sinkholes and doline • Minimise the potential for	• No significant accumulations of surface water may occur as a result of inadequate canalization of storm water. • Storm water measures must be inspected on a regular basis in order to ensure that the structures are functional and not causing soil erosion. • Re-vegetated areas are to be monitored and if necessary, soil conservation measures should be implemented to address any soil erosion that may occur. • If soil erosion is noted, appropriate remediation measures shall be implemented.	• Regular site inspection by WWTW manager. • Internal audits against this EMPr must be conducted every 6 months and records kept	Ongoing for the life of the WWTW	• WWTW manager

Activity	Aspect	Impact	Objective	Management/ Mitigation Measure	Monitoring compliance and reporting	Timeframes	Responsible Party
		surface water-contamination from the treatment ponds and artificial wetland • Siltation of the watercourse • Additional volume and dilution due to run-off into the treatment ponds may also impact on the effectiveness of the treatment system	environmental impact caused by storm water, for instance, erosion of topsoil or siltation of surface water bodies, to control general storm water disposal, and to facilitate appropriate dissipation in heavy rain events	• The storm water drainage system must be maintained (free-draining) and not contaminated by other waste sources. Storm water must be kept separate from the wastewater treatment system. • Runoff from areas without potential sources of contamination should be minimised by minimising the extent of impermeable surfaces. • Storm water must be diverted away from the treatment ponds and artificial wetland. • Placing of erosion prevention structures or vegetation to reduce water velocity at concentration points within the drainage system. • Placing of culverts underneath road foundation.	on site. Shortcomings must immediately be addressed.		
Operating machinery (e.g. pumps and aerators) and the installation of artificial night-time lighting	Increase in ambient noise levels and lighting levels (at night)	• Noise pollution and light pollution (at night) • Nuisance • Disturbance of feeding or breeding animals	Prevent the facility becoming a nuisance to adjacent landowners as a result of the increase in environmental sound levels and light levels at night	• Equipment should be selected and maintained to minimise noise levels. • Ensure that machinery (e.g. pumps and aerators) is in proper working condition, fitted with silencing equipment if necessary. • Enclose machines and equipment with elevated noise emissions (in excess of 85dB) in noise reduction housing, where possible. • Conduct regular maintenance on pumps. • Maintain a dB reading of less than 50dB at the site boundary. • Keep equipment in good repair and attend to loose or rattling covers, worn bearings and broken equipment. • Night-time lighting must be kept to a minimum and switched off when not required. • Night-time lighting must be directed away from the R50 road to prevent disturbance of passing vehicles. • A complaints register must be kept on site. The complaints register must record the following: date when complaint was received, name of person who reported the complaint and when and how the concern was addressed.	• Complaints register must be checked daily and complaints addressed as soon as possible • Regular site inspection • Annual noise readings at site boundary. • Internal audits against this EMPr must be conducted every 6 months and records kept on site. Shortcomings must immediately be addressed.	Ongoing for the life of the WWTW	• WWTW manager
Accidental spillage of hazardous substances, such as fuel or chemicals used to maintain pumps and aerators	Incorrect management of hazardous chemicals	Soil-, surface water- and/or ground water-contamination	Prevent the spilling of hazardous chemicals or materials to soil, surface water and ground water bodies	• Proper storage of chemicals in a lockable, well ventilated building. • Storage areas for hazardous chemicals are to comply with standard fire safety regulations. • Safety signage including “No Smoking”, “No Naked Lights” and “Danger”, and product identification signs, are to be clearly displayed in areas housing chemicals. • Adequate fire-fighting equipment shall be available close at hand and no smoking is permitted within the vicinity of storage areas. • Chemicals are to be properly labeled and handled in a safety conscious manner. • All personnel handling hazardous chemicals and hazardous materials are to be issued with the appropriate Personal Protective Equipment (PPE). • Limited access to the storage areas. • The removal of only the daily-required amount of chemicals to be used from the shed. • If refueling on site or from drums, the ground must be protected and proper dispensing equipment is to be used i.e. hand pumps and funnels. Drums may not be tipped to dispense fuel. • Use of drip trays during filling of machinery or equipment. Drip trays should be emptied into secondary containers on a regular basis. • Spill kits should be readily available.	• Regular site inspection. • Internal audits against this EMPr must be conducted every 6 months and records kept on site. Shortcomings must immediately be addressed.	Ongoing for the life of the WWTW	• WWTW manager
Generation of general and domestic waste	Incorrect waste management	Pollution of soil, surface water and/or groundwater by waste generated onsite	Prevent the contamination of the natural environment by pollutants from general and	• The facility manager should ensure that waste containers are provided for the collection of general waste at various points on the premises. • Proper domestic waste management and overall waste management on site. No dumping of any kind of waste (general or construction waste) will take place on site. • All containers shall be kept in a clean and hygienic manner. • Storage containers shall be stored in a manner that prevents the harbouring of pests.	• Regular site inspection. • Internal audits against this EMPr must be conducted every 6 months and records kept on site. Shortcomings	Ongoing for the life of the WWTW	• WWTW manager

Activity	Aspect	Impact	Objective	Management/ Mitigation Measure	Monitoring compliance and reporting	Timeframes	Responsible Party
			domestic waste generated onsite	• Training of staff in proper hygiene. • Frequent collection of waste in bins. • Disposal of waste at the municipal landfill site.	must immediately be addressed.		
Generation of hazardous waste during the abattoir wastewater treatment process	Incorrect waste management	• Build-up of sludge at the bottom of the treatment ponds that may compromise the treatment capacity of the system. This may lead to the discharge of only partially-treated wastewater into the environment; • Soil-, surface- and/or ground-water-contamination due to incorrect disposal of hazardous waste.	Prevent to pollution of the environment through the discharge of insufficiently treated wastewater or the incorrect disposal of hazardous waste	• Sludge must be removed from the wastewater treatment plant as stipulated by the plant designer. • The sludge must be disposed of in an appropriate manner and may not be sent to a municipal landfill site that only deals with general waste. No dumping of waste will take place on site. • Ponds must be regularly inspected for signs of sludge build up and ineffective treatment of the wastewater. • Regular monitoring of discharge water (treated wastewater) qualities.	• Regular inspection of WWTW functioning and signs of sludge build up. • Internal audits against this EMPr must be conducted every 6 months and records kept on site. Shortcomings must immediately be addressed.	Ongoing for the life of the WWTW	• WWTW manager
Water use	Inefficient and/or redundant use of a valuable resource	Wastage and/or pollution of water	Prevent the wastage and/or pollution of water	• Abattoir wastewater should be efficiently treated and re-used as far as possible. Re-use will depend on the salinity levels of the treated water. • Clean storm water must be kept away from areas where it could be contaminated and must be directed to the storm water drainage system. • Leaking taps and hose pipes are to be repaired immediately. • Running water taps and hosepipes are not to be left unattended. • Unused standpipes are to be buried to prevent damage and resultant water leaks. • Taps are to be attached to secured supports and used in preference to standpipes with no valve mechanism to open and close the water supply. All hose and tap connections are to be fitted with correct and appropriate plumbing fittings.	• Regular inspection of WWTW functioning and storm water management measures. • Internal audits against this EMPr must be conducted every 6 months and records kept on site. Shortcomings must immediately be addressed.	Ongoing for the life of the WWTW	• WWTW manager
General sanitation onsite	Unsanitary conditions	Surface- and/or ground water-contamination	Prevent the contamination of the natural environment	• Construction of toilet facilities connected to a septic tank. • The septic tank must be treated with anaerobic bacteria to break down solids and to neutralise “bad” bacteria, such as *E. coli*. • The septic tank must be emptied at regular intervals, before reaching its maximum capacity. • Ablution facilities should be maintained to prevent or minimize blockage and leakages. • Sewerage systems should be kept separate from storm water system. • Awareness of the importance of proper hygiene should be created among employees. • Toilets should have properly closing doors and supplied with toilet paper.	• Regular inspection of WWTW functioning and storm water management measures. • Internal audits against this EMPr must be conducted every 6 months and records kept on site. Shortcomings must immediately be addressed.	Ongoing for the life of the WWTW	• WWTW manager
Treatment of abattoir wastewater	Inefficient treatment of abattoir wastewater	• Soil-, surface- and groundwater-pollution	Prevent the contamination of the natural environment	• The wastewater treatment plant must be capable of treating 2 500m^3 of abattoir wastewater per day. • The wastewater must be treated to a quality that complies with the Department of Water Affairs’ General Limit standards for the discharge of wastewater into a water resource. • In terms of flow, all water uses and discharges should be measured on an ongoing basis.	• Treated wastewater qualities must be monitored on a monthly basis.	Ongoing for the life of the WWTW	• WWTW manager

Activity	Aspect	Impact	Objective	Management/ Mitigation Measure	Monitoring compliance and reporting	Timeframes	Responsible Party
		should wastewater not be treated effectively; • Disturbance of the wetland (watercourse)	though abattoir wastewater	• As far as possible, the same surface monitoring points should be used to develop a long data record and enable trend analysis and recognition of progressive impacts (or improvement) with time. • The following parameters should be monitored for the treated wastewater: ▪ pH ▪ Electrical conductivity (mS/m) ▪ Faecal coliforms (per 100ml) ▪ Chemical Oxygen Demand (COD) (mg/l) ▪ Ammonia as Nitrogen (mg/l) ▪ Nitrate/Nitrite as Nitrogen (mg/l) ▪ BOD ▪ Salinity ▪ Bacterial levels ▪ Nutrient load ▪ Suspended solids • The monitoring results should be interpreted on a regular basis to implement remedial action where the necessity is indicated. • Sludge must be removed from the ponds as prescribed by the treatment system designer. • Treated wastewater must be re-used where possible and where not possible, must be disposed of in an acceptable manner, such as through discharge into the existing natural drainage line. • The existing natural drainage line must be maintained and should be free-flowing at all times to prevent the accumulation of water on the surface. • Floating matter, such as grass, may not accumulate on the surface of the treatment ponds. • Pond and wetland embankments must be regularly maintained and inspected for structural integrity. • Wetland areas must be conserved. The WWTW must be operated efficiently to ensure that only clean, treated water is released into the environment (into the natural drainage line). • Opportunities should be identified to prevent or reduce wastewater production at the abattoir through for example recycling, reuse or process modifications.	• Continuous water flow measurements. • Recording of results. Records must be kept on site. • Internal audits against this EMPr must be conducted every 6 months and records kept on site. Shortcomings must immediately be addressed.		
Usage of resources such as electricity and water	Inefficient and/or redundant use of valuable resources	Wastage of valuable resources	Prevent the unnecessary wastage of resources	• Regular maintenance and inspection of equipment, such as water pipes, to prevent leaks. • Regular site inspection by supervisors. • Proper environmental training and awareness. • Monitoring of resource consumption. • Implementation of technologies that can reduce resource consumption. • Processes should be designed to save electricity and water where possible.	• Regular site inspection. • Internal audits against this EMPr must be conducted every 6 months and records kept on site. Shortcomings must immediately be addressed.	Ongoing for the life of the WWTW	• WWTW manager
Unlawful public access to the WWTW site	Public entrance to the WWTW	Injury or death of unauthorised persons	Prevent public access to the site	• Restrict public access to the WWTW by erecting proper fencing. • Place “No Entry” signage on the perimeter fence.	• Regular site inspection. • Internal audits against this EMPr must be conducted every 6 months and records kept on site. Shortcomings must immediately be addressed.	Ongoing for the life of the WWTW	• WWTW manager

5.4 Rehabilitation Phase

Table 4: EMPr - Rehabilitation Phase

Activity	Aspect	Impact	Objective	Management/ Mitigation Measure	Monitoring compliance	Timeframes	Responsible Party
Landscaping, replacement	Incorrect replacement and	Soil erosion as a result of soil	To avoid soil compaction	• Replacement and rehabilitation should be progressive during the project and not left until the end. • Implementation of effective and sustainable rehabilitation and remediation practices.	Regular site inspection by WWTW manager to	Before completion of	• Construction contractor

Activity	Aspect	Impact	Objective	Management/ Mitigation Measure	Monitoring compliance	Timeframes	Responsible Party
and levelling of topsoil	levelling of topsoil	compaction		• Disturbed areas must be sloped to resemble the natural contour lines as far as possible. • Disturbed areas must be cleared of any building rubble or other debris. • Subsoil must be replaced prior to topsoil replacement. • All weeds must be removed prior to topsoil replacement. • Compaction must be minimised by using the correct equipment. Excessively heavy vehicles should not be used to replace the topsoil. A dozer must be used instead of a grader. • Soils should only be moved when dry. • Monitoring and remediation of soil erosion shall be undertaken. Compacted soil should be ripped and aerated to ensure rapid vegetation establishment.	determine whether soil erosion is occurring	the construction phase	
Re-vegetation	Inefficient vegetation establishment	Soil erosion	To fully re-vegetate all areas around the WWTW where bare soil remains	• Once topsoil has been replaced, the area must be replanted/re-vegetated using appropriate, indigenous plant species as soon as possible. • Only healthy and disease free plants may be used for rehabilitation. • Sufficient topsoil shall be present around plants to prevent root desiccation. • Re-vegetated areas must be watered in dry conditions. • These vegetated areas must be maintained and monitored in order to ensure the recovery of the vegetative cover. • Compost may be used, but should be free of weed species. • Traffic and movement over the re-vegetated areas must be avoided. • Alien and invasive vegetation will be eradicated and controlled by manual removal, chemical application and biological control. The regulations in terms of the Conservation of Agricultural Resource Act, 1983 apply	Regular site inspection by WWTW manager to verify whether the re-vegetation was successful	Complete within 12 months from the end of the construction phase	• Construction contractor during construction phase • WWTW manager after construction phase

5.5 Closure Phase

At present, closure of the proposed WWTW is not foreseen. The WWTW will be operational for as long as the Delmas abattoir is operational. However, if closure is considered, an extensive closure and rehabilitation plan will be drafted and sent to the Department prior to the event.

6. Environmental awareness plan

The following environmental awareness training plan must be implemented by AFGRI Poultry in order to inform their employees and contractors of the environmental risk that may result from their work. The training plan must be conducted as part of the induction process for all new employees (including contractors) that will work at the WWTW. Proof of all training provided must be kept on site.

The general environmental awareness training plan is called the “SHE match” training program. The training program focuses on the following aspects:

1. Explaining clearly what the environment is and what the environment consist of namely, air, water, soil, fauna, flora and people.
2. Once participants have grasped the description of what the environment entails, the training focuses on the potential impacts that the construction and operational activities may have on each one of these environmental components. This is done by making use of the aspect register, where each one of the environmental aspects and associated impacts has been identified.
3. To ensure that the training is effective, visual aids are used. Photos are taken of actual and potential impacts occurring on site and in some cases role-play is used to illustrate a potential impact.
4. The participants are then exposed to a poster that reflects the various environmental components. The various photos taken are posted on the poster on a rotational basis and the participants indicate (based on the visual component) what environmental component was or could have been affected by the activities portrayed on the photo.
5. By doing this the participants visualize the action as well as the potential consequence (environmental impact) of their action.

6. This General awareness training must be done before construction commences and also when new employees start work. The training should be done every two years during the operational phase. The poster is posted in the communal area where the impacts are visualized and the photos rotated on a monthly basis.