

Attachment J

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ENVIRONMENTAL PROTECTION
AGENCY WASTE LICENSING
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Attachment J 1: Accident Prevention and Emergency Response

INTRODUCTION

The prevention of any accident, incidents and/or impacts on the environment from AVR - Environmental Solutions Ltd. will be ensured through the following methods:

- Proper storage and use of chemicals,
- Good Housekeeping and Maintenance,
- Waste minimisation/ pollution prevention,
- Maintenance of fire control systems.

There are two main causes for the likelihood of an accident, incident or a release of emissions to the environment occurring onsite and these are the possibility of a fire and the possibility of a spillage and leakage onsite.

J.1.1: GENERAL FIRE PREVENTION AND CONTROL MEASURE:

There will be a number of preventative measures onsite in the case of a fire. A fire alarm system will be installed which will comprise automatic detectors, manual call points, alarm bells, and a fire alarm/control panel. The fire alarm system will be in accordance with IS 3218 1989 or other valid regulations. The fire alarm/control panel shall be installed in the Control room, with a display which indicates the fire zone in which the alarm has been activated. In the event of a fire alarm activating, an audible and visual indication shall be sent to the constantly manned central control system.

The site will also be provided with a mobile fire fighting unit and fire extinguishers (in accordance with I.S. EN 3: 1997 and I.S. 291: 1986).

In the event of a fire all surface water outfall valves will be shut and all firewater utilised will be contained and diverted through the surface water drainage system to the fire water retention tank. The fire water retention tank has a capacity of 475m³ and this will prevent any emissions to the environment.

J.1.2: SLUDGE DRYER HAZARDS ANALYSIS

The principle hazards associated with the drying process relate to fire and explosion. Both can occur due to the presence of flammable materials in the system, whether solids or vapours.

The dried sludge is flammable. Wet sludge is non-flammable, but could contain flammable solvents or generate flammable gases, particularly methane by aerobic degradation. Another mechanism that could lead to flammable gas generation is self heating of the dried sludge producing a smouldering, oxygen deficient fire, which could generate large enough amounts of flammable carbon monoxide.

Fine (< 500 µm) particles of dried solid, if dispersed in air containing > 8% oxygen at a concentration >60 g/m³ can cause an explosion, if ignited.

Both a fire and an explosion can be prevented and/or protected against. For a fire or explosion to occur there needs to be three elements present, a fuel, oxygen and an ignition source. Fire and explosion prevention is based on eliminating at least one of these. Fire protection involves minimising the scale and effect of the incident. An example of fire protection is the installation of extinguishing devices such as water sprays. Explosion protection involves the provision of venting devices such as explosion panels, bursting discs or pressure relief valves to relieve pressure build-up to a safe place.

The hazards associated with each piece of equipment and methods of reducing them are described below. Ignition prevention is discussed in a separate section.

Receiving and Storage Bins: Wet sludge is predominantly water and thus non-flammable. However wet sludge can ferment and give off flammable gases, particularly methane. The best method of preventing a fire or explosion is to remove any possible flammable gases/vapours using a ventilation system. An air change rate of 2 x the headspace volume/hour is sufficient. Explosion protection would not be needed unless the venting arrangements ceased to function for any reason.

Feed and Recycle Sludge Mixer: At all times some dry sludge is mixed back into the wet feed, whether this is fines being returned to the system or if the system requires back-mixing to ensure good handling characteristics in the dryer. In both instances a dust explosion is possible if the material is sufficiently dry. This would only occur if for some reason the flow of wet feed stopped. An interlock that halts introduction of dry feed into the system when the flow of wet feed stops will prevent the development of an explosive situation.

Dryer Heat Source: Heat will be supplied to the dryer either as steam from a separate boiler or as hot air from a burner and heat exchanger. In the latter case the drying air will be heated by the hot burner off gasses using a plate exchanger. In neither case will be any mixing of the burner gases with the sludge, so incomplete combustion in the boiler/burner cannot introduce fuel or an ignition source into the dryer.

Sludge Dryer: In the dryer there is a possibility of fire and explosion due to the presence of dust which can be dispersed or by evaporation of flammable solvents inadvertently introduced with the wet sludge. It is possible prevent these dangers by controlling the oxygen content of the system below about 8%. However the use of an inert gas such as nitrogen or carbon dioxide would be difficult in an indirect dryer, so fire and explosion protection will be employed. The former consists of a water spray system that would fill the system with water if a fire was detected, while the latter consists of explosion panels which vent any build up of pressure to a safe place.

Dry Sludge Handling System: This includes all equipment such as the settling chamber, conveyors, vibrating screens, and dry sludge storage silos. In these the main risks are due to self heating generating fires and dispersed dust forming explosive mixtures in the air spaces. The former are minimized by cooling off the dried material to a temperature at which self heating will be minimal (below about 70°C), whilst careful control of the dust content will minimize the latter. However all dry sludge storage and handling equipment will

require protection by the installation of water sprays for fire extinguishing and suitably sized explosion relief vents.

Overheads System: The high water content of the dryer off-gases will prevent fire and explosions. Once the water vapour is removed in the condenser the mixture becomes explosive. The use of a direct Venturi type water scrubber condenser to remove any dust and flammable vapours along with the water will minimise this risk, but is not possible in an air circulation dryer system where a bag filter must be used to remove entrained dust. Bag filters constitute a major source of explosion hazards. Venting will be incorporated to minimise the effect of an explosion in the bag filter if used.

Sources of Ignition: Both fire and explosion requires ignition. Sources of ignition include external, such as sparks and naked flames, and internal such as by self-heating, discharge of static electricity, sparks generated by misaligned equipment or friction heating.

External sources of ignition will be minimized by good safety procedures and housekeeping and careful control of hot work. Hot work includes all activities that could possibly introduce ignition sources such as welding, cutting, grinding or the use of sparking tools. A work permit procedure will be mandated.

Internal ignition sources will be prevented by careful control of temperatures, grounding of all metal equipment to prevent the build up of static electricity that could lead to sparks, including the use of grounding straps and continuity checks, and good preventative maintenance practices. Heat can build up in dry sludge due to chemical or biological reactions. In the absence of a spark a temperature well in excess of 200°C needs to be generated before ignition can occur.

Fire and Explosion Propagation

An important contributing factor to many catastrophic fires and explosions is the ability of a fire or explosion to propagate from the initial source to other areas of the plant. Careful design of the equipment and layout and the use of fire transfer explosion devices such as chokes on conveyors in will minimize the chances of a fire or explosion propagating.

HAZOP Analysis: A detailed HAZOP analysis will be carried out during the equipment selection process and again before start-up. All equipment vendors will be required to provide information on any known incidents with their equipment. The safety of the installation will be a major factor in equipment selection. Likewise the design of the dryer system will incorporate the most up-to-date safety features.

Additional Information re Flammable Liquids: Accidents/ Incidents involving flammable liquids can only occur if the sludge accepted onsite is contaminated with such substances. Sludge will only be sourced from IPC/IPPC licensed facilities, where any contamination of sludge must be notified to the EPA and hauliers by law prior to disposal off-site. Also, the sludge will undergo rigorous testing before it is accepted onsite.

J.1.3: Spill/Leakage Preventative Measures

All oils and chemicals stored onsite will be stored in bunds. The two oil storage tanks proposed onsite will be fully bunded with double skins and enclosed in concrete. Bund Integrity testing will be carried out every 3 years on all bunds. Stocks of chemicals will be controlled and kept to a minimum in order to reduce the volumes which could be potentially released through a fire or accidental spillage.

In the event of contaminated surface water/stormwater entering the surface water retention tank the monitoring system will detect it and an alarm will be raised. The retention tank shutoff valve will be closed preventing any release into the environment.

J.1.4 Equipment and Power Failure Mitigation Measures

Emissions from equipment breakdown/malfunction will be minimised by routine maintenance and other preventative measures.

A stoppage of any process due to a breakdown or any unforeseen event is not expected to cause any significant release of emissions to the environment.

In the event of an electric mains supply failure the on site backup generator will start automatically and provide power to essential services. All control systems will be protected by surge protectors and battery back up so that no interruptions will occur. These safety features will ensure the continuance of essential services and the safe shut-down of plant operations.

In the event of a breakdown/malfunction of any abatement technology within the facility this will result in the automatic shut down of the process before significant releases to the environment can occur.

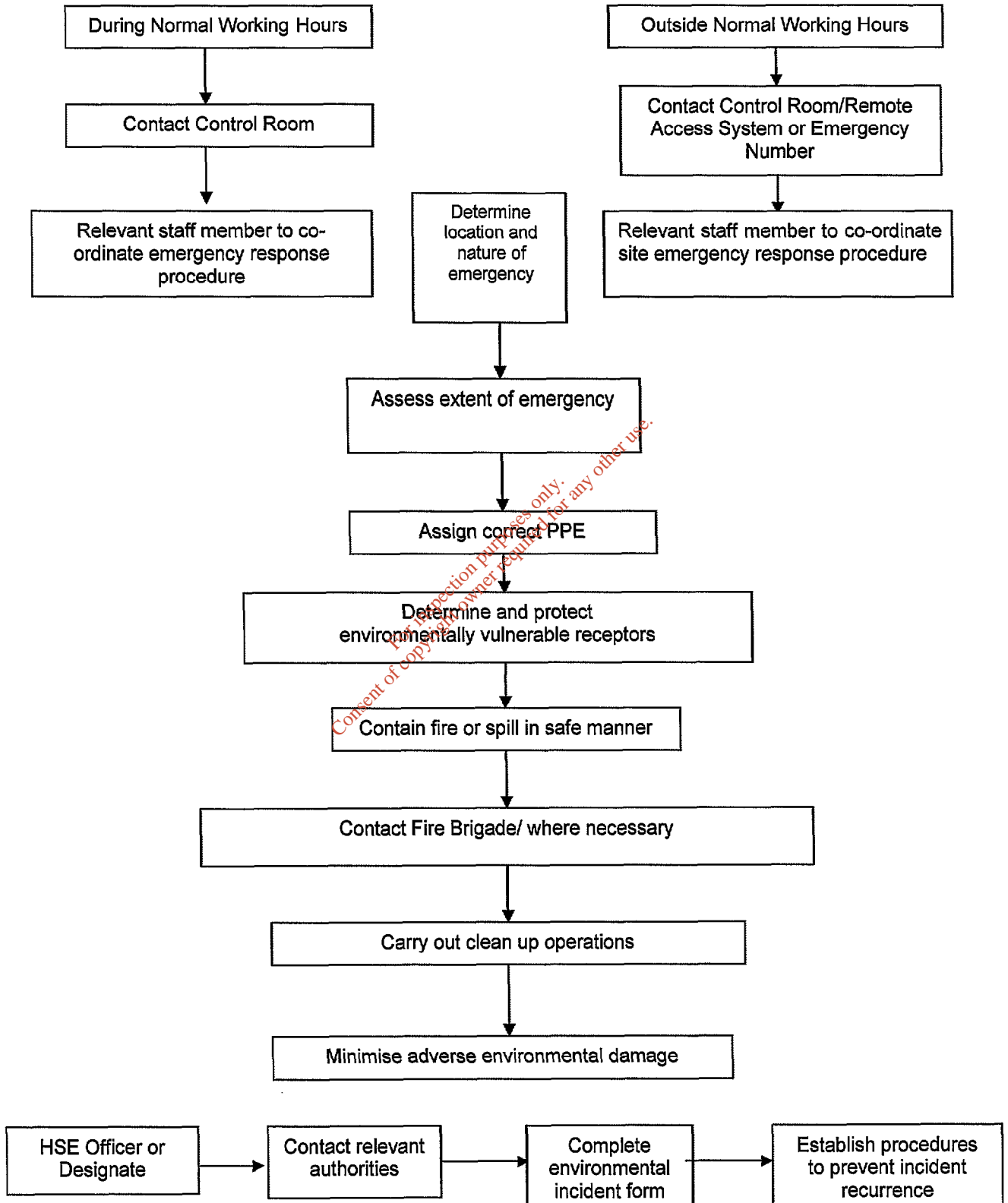
J.1.5 : Provisions for Emergency Situations Outside Normal Hours

The Waste Recycling and Transfer Building will only operate during working hours and thus will not require 24 hr coverage. The sludge dryer will operate continuously but will be monitored remotely, either from the control room or from off site, via remote access. The sludge dryer will be equipped with a series of controls which will immediately shut it down in the event that abnormal operating parameters are detected. Likewise automatic fire extinguishing, water deluge, power isolation, pressure release and other protective measures will be activated.

All emergency and warning systems for the whole site will be monitored using the same system. Full 24 hour security will be provided by CCTV and other means. Appropriate training, instructions and resources will be provided to all plant personnel to ensure that emergency situations can be controlled.

In addition, the facility will be monitored by an alarm system through a central station so that an emergency situation can be detected and assessed there. Call in of plant personnel and outside emergency services can be initiated from the control room, the remote operating equipment or the central station. Remote unlocking will allow ready access by emergency personnel.

FLOW CHART OF KEY RESPONSIBILITIES IN AN EMERGENCY



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1.0 PURPOSE

The purpose of this procedure is to ensure an appropriate response is carried out in the event of an unexpected or accidental incident or emergency situation at AVR - Environmental Solutions Ltd.

This procedure also ensures that the necessary steps are taken to prevent and mitigate any impacts that may be associated with such events, which may affect the site, its neighbours and the environment.

2.0 SCOPE

This procedure applies to all AVR - Environmental Solutions Ltd. activities that could result in a significant impact in the event of an abnormal or emergency situation.

This procedure details the steps to be taken in the event of:

- A fire,
- A medical emergency,
- An uncontained spillage/leakage.

3.0 REFERENCES

N/A

4.0 DEFINITIONS

Emergency: any event that would cause harm of injury to the companies personnel, contractors or visitors or cause harm or have an impact on the environment.

HSE Officer: Health & Safety & Environmental Officer.

Regulatory Authorities: Environmental Protection Agency, Local Authorities, Health & Safety Authority, Fisheries Board.

MSDS: Material Safety Data Sheets.

PPE: Personal Protective Equipment.

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5.0 AUTHORITY AND RESPONSIBILITY

Health & Safety/Environmental Officer:

- The HSE Officer is responsible for ensuring that the emergency response procedures provides for an appropriate response to unexpected or accidental incidents.
- He/she will give directions to bring back evacuees when the emergency is over or when appropriate.
- He/she will carry out a health & safety and environmental risk assessment of the site periodically and especially after an accident or emergency onsite.
- The risk assessment will not be limited to but will include the assessment of the operability of the emergency equipment and the adequacy of existing emergency procedures.
- He/She will ensure that any mitigation measures identified by the risk assessment are put in place as soon as possible.

He/She will organize training such as:

- Fire Extinguisher Training,
- Mobile Fire Fighting Unit Training,
- Evacuation Procedure,
- First Aid Training,
- Incident Commander training.
- The HSE Officer will maintain records of employee training, fire equipment service records and Incident Reports.

He/She will make any modifications to the emergency response procedures in accordance with the Documentation Control section of the Environmental Management System and review these procedures annually from the date of release.

Incident Commander

The Incident commander, who will usually be the HSE Officer will takecharge of any incident when it occurs.

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Employees:

Each staff member is responsible for their safety in an emergency and should comply with the evacuation procedure outlined below.

Each employee is responsible for monitoring the well being of staff and visitors during any emergency and assisting those with disabilities.

In the event of a fire or oil spill employees will be responsible to ensure that every effort is made to minimize the effect on the environment while observing all appropriate safety precautions.

It is the responsibility of the direct supervisor or the Health, Safety and Environmental Officer to instruct/train any new employees on the emergency procedures and the evacuation procedures of the company.

Employees must evacuate immediately on hearing the fire alarm to the fire assembly point.

6.0 METHOD

In the event of an emergency:

Employees must:

- Raise the alarm by breaking the glass in the nearest fire point.
- An audible fire alarm communicates to all employees to evacuate.
- All employees should stop work immediately and shut down operating equipment if it is safe to do so.
- Evacuate the building as quickly as possible. WALK, DO NOT RUN. Go to the nearest corridor and exit via nearest Emergency Exit.
- Do not return for personal belongings or re-enter buildings under any circumstances until the all clear is given.
- Proceed in a safe and orderly manner to the Evacuation Assembly point in the car park.

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The Incident Commander will:

- Contact the emergency services if they are needed.
- Delegate a specific employee to account for all employees onsite using the employee site list, the Contractors/Visitors log and clock cards and then retain all employees at the assembly point.
- Check that all personnel have been evacuated
- If employees are not accounted for attempt to locate them
- Report to Emergency Services on arrival
- Give the emergency Service Chief a copy of the Emergency Site Plan detailing all on site plant, fire abatement units and on site drains and interceptor units with the list of materials/chemicals on site etc
- Instruct all employees to return to their work only when it is safe to re-enter.

In the event of a medical emergency employees must:

- Contact the Control Room and the qualified First Aider onsite.
- First aid boxes will be located the all buildings.
- If the injured person is in direct danger, remove the person from the area and administer first aid if possible.
- If the person is not in danger, do not move the person unless absolutely necessary and administer first aid if possible.
- In the event of a serious injury call an ambulance and remain with the injured person until it arrives.
- Keep the area clear to provide access for the emergency services.
- Otherwise call the company doctor or bring the injured person straight to casualty.
- Report all injuries in the accident book and note as much information about the accident as possible.
- Report the incident to the Health and Safety/ Environmental Officer as soon as possible.

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If practicable, the area in which the incident took place should remain undisturbed until any investigations into circumstances are complete.

In the event of a fire employees must:

- Raise the alarm by breaking the glass at the nearest fire point on the route of exit.
- Employees trained in the use of fire extinguishers should attempt to tackle the fire only if it is safe to do so. The fire must appear to be small and escape routes must be present.
- If the fire cannot be tackled, the Incident Commander will initiate the actions of the mobile fire unit onsite or if necessary, the contact the fire brigade (phone 999 or 112) explaining the nature and location of the fire.
- Follow normal evacuation procedures.

The Incident Commander must:

- Initiate the actions of the mobile fire unit.
- Go to the Emergency Area.
- Ensure that the immediate area is cleared.
- If there is a medical emergency, follow the instructions as outlined.
- Ensure that complete evacuation has taken place.
- Ensure all surface water drainage release valves are shut and the Firewater Retention Tank is sealed. Ensure all contaminated fire water is diverted to the drainage system and there is no release to the environment.
- Try to establish the exact nature and origin of the fire and quantities of materials involved.
- Liaise with Fire and Emergency Services and give them a copy of the Emergency Response Plan.
- Re-instruct all employees to return to their work only when it is safe to re-enter.

Contaminated water can be sent to the waste water treatment plant or taken off site for appropriate disposal.

Complete, with the HSE Officer, an incident report. The HSE Officer is to report the incident to the Regulatory Authorities as appropriate.

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In the event of an uncontained spillage/leakage:

- Contain the spill if it is safe to do so by shutting the appropriate valves.
- Immediately report the spill to reception who will contact the HSE Officer.
- Switch off other electrical equipment in the vicinity if possible.
- Evacuate the immediate area.
- Every effort must be made to prevent the spill:
- Causing pollution to watercourses.
- Leaving the site's boundary.
- Entering any area containing waste.
- Entering groundwater.
- Ensure all surface water drainage release valves are shut to prevent any release to the environment.
- Ensure any contaminated water is contained and diverted through the surface water drainage system where any hydrocarbons will be trapped by the Class 1 Interceptors onsite.
- Contaminated waters can be sent to the waste water treatment plant for treatment and will not be released into the environment until it is deemed suitable.
- Clean up using absorbents, booms and absorbent pads stored on site in spill kits.
- If unsure what clean up process is needed, the HSE Officer will determine how best to clean up the spill. Listed MSDS sheets retained in the laboratory should be viewed.
- Use appropriate PPE such as overalls, goggles, gloves and respirators during the clean up.
- Ensure all clean up material will be disposed off in an appropriate manner.

The HSE Officer and Incident Commander must complete an incident report and report to the Regulatory Authorities as appropriate.

7.0 RELATED RECORDS

- Site Employee List.
- Emergency Site Plan.
- MSDS.
- Training Records.
- Fire Equipment Service Records.
- Incident Records.
- Risk Assessments.