Emergency Preparedness and Response Plan

Yaoure Gold Project

Perseus Yaoure SARL

Submitted to

Perseus Yaoure SARL

Submitted by

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Contents

REVISION RECORD 3

1.0 INTRODUCTION AND OBJECTIVES 4
- 1.1 General 4
- 1.2 Cyanide Code Requirements 4
- 1.3 Emergency Preparedness and Response for the Tailings Storage Facility (TSF). 5

2.0 SCOPE OF THE EMERGENCY PREPAREDNESS AND RESPONSE PLAN........ 6

3.0 RELATION TO OTHER MANAGEMENT PLANS AND PERSEUS'S PROCEDURES 7
- 3.1 Relation to other Perseus Management Plans 7
- 3.2 Perseus's Procedures and SOPs 7
- 3.3 Supporting TSF-related Documentation 9
  - 3.3.1 TSF Operations Manual 9
  - 3.3.2 TSF Failure Analysis 9

4.0 APPLICABLE GUIDELINES 10

5.0 STAKEHOLDER INVOLVEMENT 10

6.0 MAJOR ACCIDENT PREVENTION POLICY 11
- 6.1 National framework 11
- 6.2 Perseus's policy framework 12

7.0 IDENTIFICATION OF MAJOR HAZARDS AND COMPOUNDING FACTORS 14
- 7.1 Main Hazard Areas 14
- 7.2 Factors Causing Emergencies 14
  - 7.2.1 Human Error 15
  - 7.2.2 Malfunction of Equipment 15
  - 7.2.3 Medical Emergencies 15
  - 7.2.4 Natural disasters 15
  - 7.2.5 Man-made Threats 16
  - 7.2.6 Power and/or Other Utility Outages 17
- 7.3 Environmental Conditions Compounding Emergency Situations 17
  - 7.3.1 Typical Wind Directions 17
  - 7.3.2 Nearby Surface Waters 18

8.0 POPULATIONS SUSCEPTIBLE TO POTENTIAL EMERGENCY CONDITIONS 18
- 8.1 Employees, Visitors, and Contractors on the Mine Site 18
- 8.2 Populations off the Mine Site 18

9.0 EMERGENCY INCIDENT CLASSIFICATION 18
- 9.1 Level I Incidents 19
- 9.2 Level II Emergency Incidents 20
- 9.3 Level III Emergency Incidents 20
- 9.4 Level IV Emergency Incidents 21

10.0 ORGANISATIONAL RESPONSIBILITIES 21
- 10.1 Overview 21
- 10.2 Emergency Coordinator 23
  - 10.2.1 General Responsibilities 23
  - 10.2.2 Responsibilities during an Emergency 25
- 10.3 First Responders 27
- 10.4 Emergency Response Teams 28

10.4.1 Emergency Response Team Leader Responsibilities 28
10.4.2 Emergency Response Team Members Responsibilities........................ 29
10.4.3 HAZMAT Spill Response Team 29
10.4.4 Medical Emergency Response Team 29
10.4.5 Fire Fighting... 30
10.4.6 Community Liaison Manager.. 30
10.4.7 Operations Department 30
10.5 Other Departments with an important role in an emergency............................... 31
10.5.1 Security.. 31
10.5.2 Environmental Department.. 32
10.5.3 Health & Safety Department.. 33
10.6 Process Control and Verification by Foremen and Workers 34

11.0 CO-ORDINATION WITH EXTERNAL EMERGENCY RESPONSE................................ 35
11.1 External Emergency Response Plan.. 35
11.2 External Notification of Emergency Situations 35

12.0 EMERGENCY ALARMS AND COMMUNICATION SYSTEMS 37
12.1 Internal Alarm Systems 38
12.2 External Alarm Systems 38
12.3 Internal Communication Systems... 38
12.4 External Communication Systems 38
12.5 Site Map and Sign Posting 38
12.6 General Provisions 39
12.7 Emergency-Specific Actions... 39
12.7.1 Fire.. 39
12.7.2 Potential Cyanide Release in the Process Plant Area 40
12.7.3 Failure of Cyanide Detoxification... 42
12.7.4 TSF Dam Failure and Tailings Spillover... 43
12.7.5 Tailings Pipeline Rupture... 45
12.7.6 Pit and Waste Rock Dump Slope Failures 46
12.7.7 Explosives Accidents... 47
12.7.8 Chemical, Fuel and Waste Spills... 48
12.7.9 Medical Emergencies 50
12.7.10 Power Outages... 51
12.7.11 Natural Disasters 51
12.8 Cyanide-Specific Remediation Guidance... 52
12.9 Evacuation Procedures 53
12.9.1 General Provisions 53
12.9.2 Personnel Accounting.. 54
12.9.3 Returning to Work.. 54

13.0 EMERGENCY AND MEDIA COMMUNICATION PROCEDURES 54
13.1 General Provisions 54
13.2 In Case of an Emergency... 54
13.3 Responsibilities.. 55

14.0 POST-EMERGENCY RECOVERY 55

15.0 POST-EMERGENCY MITIGATION 55
15.1 General Provisions for Post-emergency Cleanup and Recovery......................... 55
15.2 Detailed Cleanup and Remediation Plans... 56
15.3 Post-Emergency Decontamination... 57
15.3.1 Employee Decontamination.. 57
15.3.2 Emergency Response Personnel Decontamination................................ 57
15.3.3 Equipment Decontamination 57

16.0 EMERGENCY INCIDENT INVESTIGATION AND DOCUMENTATION 58
  16.1 Emergency Response Log Sheet 58
  16.2 Post-Emergency Response Report 58

17.0 EMERGENCY RESPONSE EQUIPMENT 59
  17.1 Fire Fighting Equipment 59
    17.1.1 Portable Fire Extinguishers 59
    17.1.2 Fire Hydrants/Containers of Water 59
  17.2 Emergency Response Equipment 59
  17.3 Mobile Equipment that can be used in Emergency Response 60
  17.4 Emergency Lighting 60

18.0 EMERGENCY PREPAREDNESS INSPECTIONS 61
  18.1 Inspections of Emergency Response Equipment 61
  18.2 Inspections of Alarm and Communication Systems 61
    18.2.1 Testing of Alarms 61
    18.2.2 Testing of Communications Systems 62
  18.3 Bulk Storage Tank Inspections 62
  18.4 Packaged Product Storage Inspections 62
  18.5 Explosives Storage Magazine Inspections 63

19.0 IMPORTANT TELEPHONE CONTACTS 63

20.0 TRAINING AND DRILLS 64
  20.1 Site Induction 64
  20.2 Training 64
  20.3 Emergency Response Drills 65

21.0 AVAILABILITY AND UPDATING OF THE PLAN AND RELATED DOCUMENTS 65
  21.1 Location of Documents 65
  21.2 Updates 66
  21.3 Responsibility for Updates 66

List of Tables

Table 10-1 Managers and actions in an emergency 25
Table 17-1 Emergency Response Equipment locker inventory 59
Table 18-1 Emergency Response Equipment Inspections 61
Table 19-1 Important contact details, Perseus Mining 63
Table 19-2 Important contact details, external 64

List of Figures

Figure 10-1 Perseus's emergency preparedness and response organisation 22

1.0 INTRODUCTION AND OBJECTIVES

1.1 General

Decree No. 98-42 of 28 January 1998 on the Organisation of the Emergency Plan Against Accidental Pollution of the Sea, Lagoons and Coastal Areas sets out requirements to develop an emergency plan (POLLUMAR) and to co-ordinate emergency planning and response activities with the Company of Intervention Against the Pollution of the Sea and Lagoon environment (CIPOMAR).

All authorities, State agencies, officers of public and private corporations and any person discovering a marine, coastal and lagoon pollution, must transmit this information immediately to CIPOMAR.

The Inter-Ministerial Instruction No. 070INTP.C. of 13 May 1994 on the Organization of Technical Accident Relief (Plan ORSEC) requires that an Internal and an External Emergency Preparedness and Response Plan are developed, based on a study of potential hazards and accident scenarios.

The primary purpose of the Emergency Preparedness and Response Plan (referred to hereafter as the “Emergency Plan” or “Plan”) is to provide a guidance document containing the measures PerseusPerseusPerseus Yaoure SARL (Perseus) will use to prevent, prepare for, and implement in response to emergency situations that could potentially occur at the open pit mine, the process plant, waste rock dumps, the tailings storage facility (TSF) and related facilities. It applies only to the Yaoure Gold Project (the Project) activities, and focuses on the concepts of prevention and preparedness in minimising the extent and impact of emergencies that may arise in association with all phases of Project activities.

The guidance and procedures provided in this Plan are designed to uphold PerseusPerseus policies for minimising potential hazards to human health, property and the environment. Pre-planning, preventative measures, training, and efficient execution of the procedures outlined in this Plan and the Perseus *Occupational Health and Safety Plan* should minimise the potential hazards and reduce the potential impact of hazardous operations within Perseus’s mining and mineral processing operations. International experience and common sense strongly indicate that the difference between an emergency situation with a relatively easy recovery and one with incapacitating or long-term effects is in pre-planning, training, and proper execution of emergency procedures.

The current version of the Emergency Preparedness and Response (EPR) Plan provides the general conceptual framework of EPR management and describes the formalism for implementation on site. It will be updated once construction is finished and details of the operations are fully known.

1.2 Cyanide Code Requirements

The gold ore processing at the Project is based on cyanidation followed by the Carbon in Leach (CIL) process. Although Perseus is not currently a signatory to the International Cyanide Management Code (the Code), adopting the principles of the Code would be recognised as best practice. Principle 7 of the Code (July 2012) requires the development of emergency response strategies and capabilities, in order to protect communities and the environment.

The requirements of Principle 7 of the Code are summarised in the following:

- Standard of Practice 7.1: Prepare detailed emergency response plans for potential cyanide releases;
- Standard of Practice 7.2: Involve site personnel and stakeholders in the planning process;
- Standard of Practice 7.3: Designate appropriate personnel and commit necessary equipment and resources for emergency response;
- Standard of Practice 7.4: Develop procedures for internal and external emergency notification and reporting;
- Standard of Practice 7.5: Incorporate into response plans monitoring elements and remediation measures that account for the additional hazards of using cyanide treatment chemicals; and
- Standard of Practice 7.6: Periodically evaluate response procedures and capabilities and revise them as needed.

This *Plan* addresses the requirements of Principle 7 of the Code. The Implementation Guidance for the Code (October 2009) suggests that although an Emergency Preparedness and Response Plan specific to cyanide is not required, the necessary emergency response procedures should be formalised in a single document so that all necessary information is readily available in the event of a cyanide release.

It must be noted that there are other management documents (e.g., the Occupational Health and Safety Plan), Standard Operating Procedures (SOP) and training materials that are also related to the management of cyanide. This Plan must be read in conjunction with those other documents.

1.3 Emergency Preparedness and Response for the Tailings Storage Facility (TSF)

The TSF is a particularly important element of the Project infrastructure and therefore deserves special attention in the context of emergency preparedness and response. International best practices such as the UNECE Draft Guidelines and Good Practices for Tailings Management Facilities (2008) or the EU Reference Document on Best Available Techniques for Management of Tailings and Waste Rock in Mining Activities (2009), recommend that emergency plans should be established prior to commencement of operations by TSF operator (internal plans) and by authorities (external plans). They should be tested and revised:

- When an accident or emergency situation occurs at the site or other similar sites;

- When the emergency service organization or its senior personnel is changed;
- After new technical knowledge becomes available or when new risks are identified;
- If design values are approached or exceeded by 20% as a result of changes, or in the case of mismanagement, structural problems, equipment modification or natural events; and
- At regular intervals as determined in the emergency plans themselves.

2.0 SCOPE OF THE EMERGENCY PREPAREDNESS AND RESPONSE PLAN

This Plan is intended for use by the Perseus emergency response organisation and Perseus employees on the Project site. It will address the following emergency response elements:

- Identification of potential emergency scenarios;
- Emergency response organisation and responsibilities;
- Co-ordination with external/governmental emergency response organisations;
- Emergency alarms and communication systems;
- Emergency response procedures;
- Emergency and media communication procedures;
- Evacuation procedures;
- Emergency response equipment;
- Post emergency recovery and mitigation;
- Spill prevention measures;
- Clinics, Hospitals, On-Call Doctors, Paramedics, Ambulances, Fire Fighters;
- Emergency preparedness inspections, training and drills; and
- Maintenance (updates) and control of this Plan.

It should be emphasised that this Plan is designed to provide guidance for anticipated emergencies. This Plan cannot provide all necessary details for all possible emergency situations. Therefore, appropriate, responsible and trained personnel representing all stakeholders will be expected to make and execute spontaneous decisions to react effectively to unexpected emergencies. The planning and resource identification provided herein is designed to provide important and useful guidance in any emergency.

In the event of emergency situations that could impact the environment and or populations off the Project site, this Plan is intended to be applied in conjunction with any established community emergency plans ("External Emergency Plan"), which may be maintained by appropriate officials from the communities adjacent to the mine site. Perseus will keep a current copy of any community emergency plan(s) at the Project site. It must be noted that the process of developing an External Emergency Plan that is fully operational and tested may take a long time. In the meantime, Perseus will sensitise the community so that community members and officials are aware of the procedures followed by Perseus, i.e., information about an accident, ways the Company will respond, etc..

Deliveries of fuel, reagents (including cyanide) and other consumables will be trucked on the major arterial roads from the ports of Abidjan or San Pedro. All contractors and suppliers that use the access road will implement the same mitigation measures and adhere to the same standards as Perseus. These measures will be integrated into the next update of this Management Plan.

3.0 RELATION TO OTHER MANAGEMENT PLANS AND PERSEUS'S PROCEDURES

3.1 Relation to other Perseus Management Plans

The Emergency Preparedness and Response Plan is part of the Environmental and Social Management System (ESMS), a suite of interrelated management documents of Perseus's operations. Other documents most relevant in the context of this Plan include, but are not limited to, the following:

- Water Management Plan;
- Occupational Health & Safety Management Plan; and
- Stakeholder Engagement Plan.

These Plans form a management system that is also required by the Cyanide Code under the overarching term Cyanide Management System. It must be noted that this Plan has been prepared on a conceptual level and needs adaptation to the site-specific conditions once the specific planning and design details are known.

All Management Plans are also living documents subject to regular revisions and updates, which will be integrated into the Emergency Plan in the next revision.

3.2 Perseus's Procedures and SOPs

The following procedures and Standard Operating Procedures (SOP's) are relevant in the context of this Plan:

- Risk Assessment Procedures;

- Storage and Handling of Fuels and Oils;
- Spill Prevention and Response Procedure;
- Incident Management Procedures;
- Procedure for Permits to Work;
- Procedure for the Control of Documents/Record;
- Personal Protective Equipment Procedure;
- Fire and Electrical Management Procedures;
- Energy Isolation and Lock-off Procedure;
- Cyanide-Management Procedures;
- Confined Space Procedure;
- Working at Heights Procedure;
- Transport Safety Procedures;
- Procedures for management and use of the Ambulance;
- Evacuation Procedure;
- Site Security Procedures;
- Emergency Response Equipment Procedures;
- Preventive Maintenance, Inspections, and Testing Procedures;
- Blasting Safety Procedures;
- Training Modules:
  - Safety Induction;
  - General First Aid Training;
  - Cyanide First Aid;
  - H&S Training;
  - Cyanide Emergency Drill training materials;
  - Fire fighting training;

    - Training knowledge tests;
- Forms and record templates:
    - Safety and Task Observation Form;
    - Incident Report Form;
    - Permit to Work Forms;
    - Emergency Response Log Sheets;
    - Training Records;
- TSF related supporting documentation;
    - TSF Design and As-Built Documentation;
    - TSF Operations Manual; and
    - TSF Failure Analysis.

3.3 Supporting TSF-related Documentation

3.3.1 TSF Operations Manual

An important condition of the safe operation of a TSF is the development and implementation of an Operations Manual. Such a Manual is not available at the moment but will be developed and implemented by Perseus and taken into consideration in the next revision of this Plan. The Operations Manual allows identification of potential failure modes of a tailings management facility, and must be integrated into the emergency planning.

Any changes to the operation manual should be subject to a change management analysis, which should be documented.

3.3.2 TSF Failure Analysis

An analysis will be prepared to determine the most likely mode of dam failure under the most adverse, but realistic, conditions and the resulting peak water and solids outflow following the failure (“Run-Out Analysis”). The village that would be most affected in case of a tailings containment failure is Kouakougnanou, downstrream of the dam.

The results shall be used in an update to this Emergency Preparedness and Response Plan to estimate the amounts and types of equipment needed to deal with polluting or dangerous releases as well as construction materials and equipment needed for emergency repairs to the TSF based on the structural, foundation, and other characteristics of the dams. Provisions should also be made for clean-up of any material that may be released from a TSF in an accident (dam failure, overtopping, channelling).

4.0 APPLICABLE GUIDELINES

This Plan is developed in keeping with the requirements of:

- IFC, General Environmental, Health and Safety Guidelines (2007);
    - Emergency Preparedness and Response (Section 3.7)
- IFC Performance Standards (2012);
    - Performance Standard 1 (20), and
    - Performance Standard 4 (11).
- Principle 7 of the Implementation Guideline for the International Cyanide Management Code (October 2009); and
- EU BREF on Tailings Management and Waste Rock in Mining Activities (2009):
    - Section 4.2.1.3, Subsection "Emergency Preparedness Plan".

Other standards and guidelines applicable in the context of this Plan include, but are not limited to, the following:

- UNEP/ICMM: Good practice in emergency preparedness and response (2005);
- UNECE: Draft UNECE Guidelines and Good Practices for Tailings Management Facilities (2008); and
- UNEP APPEL for Mining: Awareness and Preparedness for Emergencies at the Local Level (2001).

5.0 STAKEHOLDER INVOLVEMENT

According to the international best practice (e.g., the EU Best Practice Document on Tailings and Waste Rock Management, BAT Section 4.2.1.3, or the Cyanide Code Standard of Practice 7.2), workforce and off-site stakeholders, including potentially affected communities, should be included in the emergency response planning process.

The workforce can provide significant input in the identification of potential failure and release scenarios and response capabilities. The focus in identifying impacts of emergency situations is on the release of tailings and cyanide bearing solution from the TSF, because this scenario has the most serious consequences.

The communities of:

- Kouakougnanou;
- Kossou;

- Angovia;
- Allahou-Bazi; and

will be made aware of the nature of the risks associated with accidental cyanide and tailings release (most relevant for Kouakougnanou) and will be consulted regarding communication and response actions. It is especially important that the operation involves communities when the community has a role in the response action, such as when an evacuation may be necessary.

The health centre in Angovia near the Yaoure Project site and potentially also health centres in Bouaflé and clinics/hospitals in Yamoussoukro may be able to assist in a cyanide-related or other emergency, should this happen at the Project area.

Regular consultation and communication with the local community or its representatives should also be conducted as necessary to assure that the Plan addresses current conditions and risks.

This consultation process is part of the Stakeholder Engagement Process of Perseus and will be documented according to the provisions in the Stakeholder Engagement Plan (SEP).

6.0 MAJOR ACCIDENT PREVENTION POLICY

6.1 National framework

Perseus's policies related to emergency prevention and response are closely linked to the national legislation and administrative responsibilities of the government, especially in relation to "external" emergency preparedness and response.

Côte d'Ivoire's Ministry of Environment, Water and Forests is responsible for emergency preparedness and response policies in Côte d'Ivoire. The country is signatory to the Hyogo Framework for Action (HFA) 2005-2015, which is based on five priority action commitments:

- Ensure that disaster risk reduction is a national and a local priority with a strong institutional base for implementation;
- Identify, assess and monitor disaster risk and enhance early warning;
- Use knowledge, innovation and education to build a culture of safety and resilience at all levels;
- Reduce underlying risk factors; and
- Strengthen disaster preparedness for effective response at all levels.

A literature search identified limited information on emergency preparedness, response and emergency services. Based on updates provided at the Hyogo Framework for Action

(HFA) 2005-2015, provisions for emergency preparedness and response appear to have been planned but not yet implemented. Lack of health care infrastructure and efficient and responsive services likely limits operational capacity. As such, emergency response appears to be limited to international humanitarian emergency relief (e.g., United Nations Office for the Coordination of Humanitarian Affairs (OCHA) 2011).

This situation will have to be taken into consideration by Perseus when updating the Emergency Preparedness and Response Plan for the Yaoure operations.

6.2 Perseus's policy framework

Perseus is committed to developing, implementing, and maintaining management systems for environment, health, and safety activities that are consistent with internationally recognised standards and its business expectations, in accordance with the legislation of Côte d'Ivoire and relevant international guidelines.

It is Perseus's commitment to minimise the risk of harm to the environment, employees, visitors, and surrounding communities.

Throughout all Perseus's environmental, health and safety activities, it will:

- Provide sufficient resources to accomplish its environmental, health and safety policy principles and codes of conduct;
- Pro-actively manage risk to the environment and its employees;
- Implement systematic measures to track its efforts, successes, and incidents;
- Conduct or support research programmes to increase knowledge and awareness of potential emergencies associated with mining activities; and
- Strive to be among industry leaders in environmental, health and safety.

With respect to emergency planning and response, Perseus is committed to the following:

Perseus will implement an Emergency Preparedness and Response Plan (i.e., this Plan and future updates). Perseus will apply the Plan whenever a tangible risk for major incidents to occur has been identified or an uncontrolled event occurs that is or could lead to a major incident. Perseus will review, test, revise and update the internal Emergency Preparedness and Response plan at the point of time when there is a change in the mine operation and management.

Perseus will establish incident reporting mechanisms. Perseus will institute programmes that will monitor performance towards providing a work environment that is free of occupational environmental, health and safety incidents. Preventive measures will also be implemented to minimise the risk of injury and illness to employees.

Perseus will seek to establish long-term relationships with stakeholders. Perseus will work to build relationships with local communities and other stakeholders on the basis of open and transparent dialogue, development of mutual trust and understanding, implementing and meeting rigorous performance standards, and learning from the communities' experience.

Perseus has primary responsibility for ensuring safety of the operations and formulate and applying safety management procedures, as well as utilizing technology and management systems to improve safety and reduce risks.

Perseus will only employ competent personnel in the planning, design, construction, operation/management, closure of the operations and the relevant competences are described in the respective position descriptions. Personnel will be properly certified where required by the legislative, regulatory and safety management norms of Côte d'Ivoire.

Perseus will operate the Project in accordance with the construction, safety and environmental norms of Côte d'Ivoire and on the basis of an operating and management system evaluated and accepted by the relevant competent authority, as appropriate.

Perseus will operate the Project based on relevant operating and management plans and procedures that are available to all personnel, government inspectors and other relevant stakeholders. All documents relating to planning, design and construction will be maintained in an accessible way, with records kept permanently for reference at a future time.

Perseus will monitor the operations in accordance with the relevant operating and management plans and procedures as approved by the competent authorities.

Perseus will cooperate with competent authorities and local communities in preparing the emergency plan.

Perseus will train its personnel reinforce and revise personnel's knowledge on safety and in particular on how to identify potentially harmful events.

Perseus will implement environmental audits for their facilities and promote use of environmental management systems.

Perseus will notify competent authorities in case of emergencies that have occurred on the site.

Perseus considers the following **Key Performance Indicators** important to determine the efficiency of the Emergency Preparedness and Response:

- KPI 1: Non-observance of provisions in the Emergency Preparedness and Response Plan
    - Target: 0
    - Verification period: Monthly
- KPI 2: Injuries

  - Target: 0
  - Verification period: Annually

- KPI 3: Environmental damage and pollution due to accidental releases
  - Target: 0
  - Verification period: Annually.

Language requirements: With respect to the above commitments, it is of particular importance that all policies, training materials, SOPs and other documents that must be understood by all Project personnel at all levels are provided in **French and English**.

7.0 IDENTIFICATION OF MAJOR HAZARDS AND COMPOUNDING FACTORS

7.1 Main Hazard Areas

The following areas have been identified as sources of major hazards:

- Chemicals and Reagents handling, storage and transportation (including cyanide);
- Uncontrolled seepage of cyanide containing process fluids and other aqueous solutions;
- Overtopping of ponds and impoundments, especially with high cyanide concentrations;
- Failure of cyanide treatment, destruction or recovery systems;
- Uncontrolled explosions;
- Spills of fuels, lubricants, and hazardous chemicals;
- Loss/spill of tailings (from breach of pipeline, dam failure or tailings overtopping);
- Rock/mudslide of waste rock; and
- Mine pit slope failure.

7.2 Factors Causing Emergencies

Emergencies can occur as a result of the following factors:

- Human error;
- Malfunction of equipment;

- Medical emergencies;
- Natural disasters;
- Man-made threats;
- Power and/or other utility outages; and
- A combination of any of the above.

7.2.1 Human Error

Human error includes inappropriate operation of equipment and facilities and can be caused by:

- Insufficient training and awareness;
- Fatigue; and
- Negligence.

Appropriate training of all staff involved with critical operations which can lead to an emergency is therefore paramount.

7.2.2 Malfunction of Equipment

Equipment and technical facilities may not function as planned or specified, due to technical failure, and may therefore cause emergency situations.

It is therefore important that operators understand the function of the equipment, its proper operations, preventative measures, maintenance procedures etc. to prevent, as far as possible, breakdown of critical equipment and facilities.

7.2.3 Medical Emergencies

Onsite medical emergencies resulting from non-vehicular accidents or illnesses involving employees, mine visitors or contractors are a reasonably common occurrence for a large mining operation, and timely and appropriate medical response may be of crucial importance.

7.2.4 Natural disasters

Natural disasters can occur suddenly or may be predictable with several hours or days warning, as in the case of extreme meteorological conditions. In either case, having a plan in place to deal with the disaster before, during and after is the key to minimizing the impacts on the facility. The following potential natural disasters have been identified:

- Floods;

- High winds;
- Severe weather/precipitation;
- Lightning strikes;
- Intermittent droughts;
- Forest fires; and
- Epidemics.

While natural disasters are not predictable or preventable, the consequences of a natural disaster may potentially include the initiation of one or more of the “major accident scenarios”. It shall be the responsibility of the Perseus emergency response team, during and following a natural disaster, to assess if the conditions defining any of the major accident scenarios or other detrimental consequences have been initiated and to take appropriate response actions.

7.2.5 Man-made Threats

Manmade threats to the facility can also occur unexpectedly, such as in the case of a civil disturbance such as a strike or demonstration. In such a case, having a plan in place to deal with the threat before, during and after is the key to minimising operational and environmental impacts. The following potential manmade threats have been identified.

- Onsite presence or use of unauthorised weapons;
- Vandalism and sabotage;
- Civil disturbance (civil violence, strikes or demonstrations); and
- Theft.

While manmade threats are not predictable and are not always preventable, the consequence of manmade threats/actions may potentially contribute to the initiation of one or more of the major accident scenarios. Project plans and SOPs established for the detection or prevention of manmade threats include the following:

- Stakeholder Engagement Plan;
- Site Security;
- Transport Safety;
- Fire Prevention and Fire Fighting; and
- Grievance Procedure.

Some of these documents will be developed or updated by Perseus after the detailed design of the operations is completed.

7.2.6 Power and/or Other Utility Outages

Power and/or other utility outages can create significant emergencies if appropriate backup and/or procedures are not in place to deal with such situations. For example, in case of electricity blackout/generator failure, cyanide control or water treatment equipment may not work properly, or surveillance and alarm systems may not work. Therefore, electricity backup generators shall be installed to keep all critical equipment operational during times of power outages.

7.3 Environmental Conditions Compounding Emergency Situations

The magnitude of an emergency may be compounded by certain environmental conditions that can be measured or predicted ahead of time. The following sections provide guidance on environmental conditions that will be monitored in order to provide valuable information during an emergency.

7.3.1 Typical Wind Directions

During any hazardous material spill, fire, and/or explosion, releases to the air are likely. Therefore, it is important to understand prevailing wind directions as well as real-time wind directions and velocities, as this information is critical in determining exposure pathways and making evacuation decisions. Hazardous materials response teams and the fire/rescue fighting teams shall have access to real time data from the on site met station(s) and particularly the wind socks that are widely visible to indicate wind direction. Where necessary, response teams will be equipped with hand-held wind direction/velocity meters. Response teams shall also be trained in the general requirements, which includes basic information about prevailing wind patterns at the site. They will be provided the detailed procedures for collecting, analysing, and utilising ambient air monitoring information. This information shall be made available to emergency response personnel during any emergency in which air emissions are likely.

Monitoring data (see Climate Baseline Report, Amec Foster Wheeler, 2015) show that the prevailing wind direction is SW-SSW.

It should be noted that the plant area is surrounded by waste rock dumps and stockpiles that would act as screens for airborne HCN gas.

In addition, information shall be maintained on the predicted or actual location of employees, visitors, and contractors on the site, as well as those populations off-site that are within reasonable exposure pathways in any releases to ambient air.

7.3.2 Nearby Surface Waters

Hazardous material spill releases typically present a potential impact to surface water and associated drainages. It is therefore important to understand the location, flow direction, and general hydrological characteristics of local water bodies in determining exposure pathways and making appropriate emergency response decisions.

The surface water body that is most exposed to pollution risk is the Bandama river and its western tributaries around the TSF.

The Water Baseline Study and the Water Management Plan provides the detailed procedures for monitoring, collecting, and analysing surface water flow information over the life of the mining operation. This information will be summarised in training materials provided to emergency response personnel so that they will understand waterway locations and flow characteristics and respond appropriately during emergencies in which surface waters are potentially threatened.

In addition, training information shall include the predicted or actual location of employees, visitors, and contractors on the site, as well as the residential areas that are within exposure pathways involving potential releases to surface waters.

8.0 POPULATIONS SUSCEPTIBLE TO POTENTIAL EMERGENCY CONDITIONS

8.1 Employees, Visitors, and Contractors on the Mine Site

Up to approximately 600 individuals will be present on the Yaoure mine and plant site if the project is operational. This number will be temporarily higher (around 900) during construction. During closure, this number will drop significantly.

8.2 Populations off the Mine Site

Offsite populations susceptible to potential emergency conditions are mainly those who are located downstream of the TSF on the potentially affected water courses.

9.0 EMERGENCY INCIDENT CLASSIFICATION

In an emergency situation, it is important to immediately recognise the implications of the impact so that appropriate levels of response can be implemented. For example, although an onsite fuel spill captured by a secondary containment may be significant, this type of incident demands a totally different response than would a transportation emergency involving a spill of sodium cyanide and which therefore potentially threatens human health and the environment outside the Project boundary. It is therefore important during the initial response to an emergency to be able to rapidly classify the situations so that all emergency response personnel subsequently contacted understand the potential nature and extent of the emergency and the full range of response personnel, qualifications, and equipment that will be required.

The incident classification system described in the paragraphs Level I Incidents through Level IV Emergency Incidents is designed to quickly communicate the required level of response to emergency responders and other stakeholders. As there are no Fire Fighting Departments or professional Hazardous Material HAZMAT handling organisations near the Yaoure site, Perseus will have their own trained Fire Fighting and HAZMAT teams which can be assembled at short notice should the need arise.

As soon as possible after initially responding to an emergency, the incident classification shall be made by the first responder(s) to the incidents or by those personnel most familiar with what has happened in discussions with first responders and/or the Emergency Coordinator[1]. Classifications and subsequent actions may be revised with the concurrence of the Emergency Coordinator (see Section 10.2) as warranted based on new or revised information.

Incidents will be categorised in increasing levels of seriousness or required response activity as follows:

- **LEVEL I** – no offsite impacts, can be managed by onsite personnel, and no fire fighters, HAZMAT, or first aid/medical team resources are required;
- **LEVEL II** – no offsite impacts, but the assistance of the Perseus trained fire fighters, HAZMAT, or first aid/medical team resources will be required by onsite personnel;
- **LEVEL III** – no offsite impacts; however, assistance by the fire fighters, HAZMAT, or first aid/medical team resources will be required by onsite personnel, and evacuation of employees, contractors, and/or visitors is required; and
- **LEVEL IV** – known or potential offsite impacts exist that present threats to human health and the environment such that the requirements of this Plan and affected community emergency plans must be co-operatively implemented.

9.1 Level I Incidents

Level I incidents can be effectively managed by trained first response personnel within the confines of the Project boundary without the need for emergency responses on the part of the Fire Fighting Team, HAZMAT Team, Medical Team, or emergency response contractors.

Examples of Level I incidents may include:

- Spills of chemicals, wastes, or fuels that can be effectively contained and abated with spill control kits or other immediately accessible equipment by trained employees working in or near the spill area; and

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[1] often also referred to “Emergency Commander”

- Small fires that can be extinguished with portable fire extinguisher or fire hoses by trained employees working in or near the spill area.

In both examples, it is assumed that evacuation is not required. Level I incidents still require internal notification to SHEC Manager, and may require reporting to external regulatory agencies. Once the emergency situation is under control, cleanup or other final action for of Level I incidents may require outside resources (such as contractors and/or specialised equipment).

The SHEC Manager will act as Emergency Coordinator for Level I incidents if designated by the General Manager.

9.2 Level II Emergency Incidents

Level II incidents differ from Level I incidents in that in addition to first response personnel, Fire Fighting Team, HAZMAT Team, Medical Team, or emergency response contractors are called to the incident site, even if it is later determined that such response may have been unnecessary. Examples of Level II incidents may include:

- Spills of chemicals, wastes streams, or fuels that required the assistance of the HAZMAT team and specialised equipment or supplies in order to effectively contain or abate the release;
- Fires too large to be quickly extinguished or that involved hazardous materials, and therefore a response from the Fire Fighting Team; and
- Serious medical emergencies requiring more than first aid and therefore require Medical Team support.

In all of these examples, it is assumed that evacuation is not required.

The SHEC Manager will act as Emergency Coordinator for Level II incidents if designated by the General Manager, which may require reporting to external regulatory agencies. Once the emergency situation is under control, cleanup or other final action for of Level II incidents may also require external resources.

9.3 Level III Emergency Incidents

Level III incidents differ from Level I and II incidents in that in addition to response from the fire fighting team, HAZMAT Team, Medical Team, or emergency response contractors some level of evacuation of employees, visitors, and/or contractors is required. Examples of Level III incidents would include:

- Spills of chemicals, wastes streams, or fuels that required the assistance of the HAZMAT team and specialised equipment or supplies in order to effectively contain or abate the release and that also required evacuation of personnel;

- Fires too large to be quickly extinguished or that involved hazardous materials, and therefore a response from the Fire Fighting Team and that required evacuation of personnel; and

- Any situation that requires evacuation of one or more areas of the facility.

The General Manager will act as Emergency Coordinator to manage the resolution of Level III incidents, which will require internal notification to the CEO of Perseus, Country Manager, SHEC Manager and the Community and Government Relations Officers. Level III incidents are likely to require reporting to external regulatory agencies. Once the emergency situation is under control, cleanup or other final action for of Level III incidents may also require external resources.

9.4 Level IV Emergency Incidents

Level IV incidents present a tangible threat to human health or the environment beyond the Project boundary such that this *Plan* will be implemented in co-ordination with the emergency plan or plans from the affected community or communities. If a Community ("External") Emergency Plan is also put into effect, this will require close co-ordination between facility and community emergency response actions. Examples of Level IV incidents could include:

- Spills of materials, equipment, chemicals, or fuels in transit to the Project site;

- Major fires or explosions that cannot be contained or controlled with only onsite resources, and require additional emergency response resources from the local community; and

- Any situation that requires evacuation of one or more residents outside the Project boundary or with habitations within the protected areas of the Project.

The General Manager will act as Emergency Coordinator to manage the resolution of Level IV incidents, which will require internal notification to the CEO of Perseus, Country Manager, SHEC Manager, and the Community and Government Relations Officers. Level IV incidents will always require reporting to external regulatory agencies. Once the emergency situation is under control, cleanup or other final action for Level IV incidents may also require external resources.

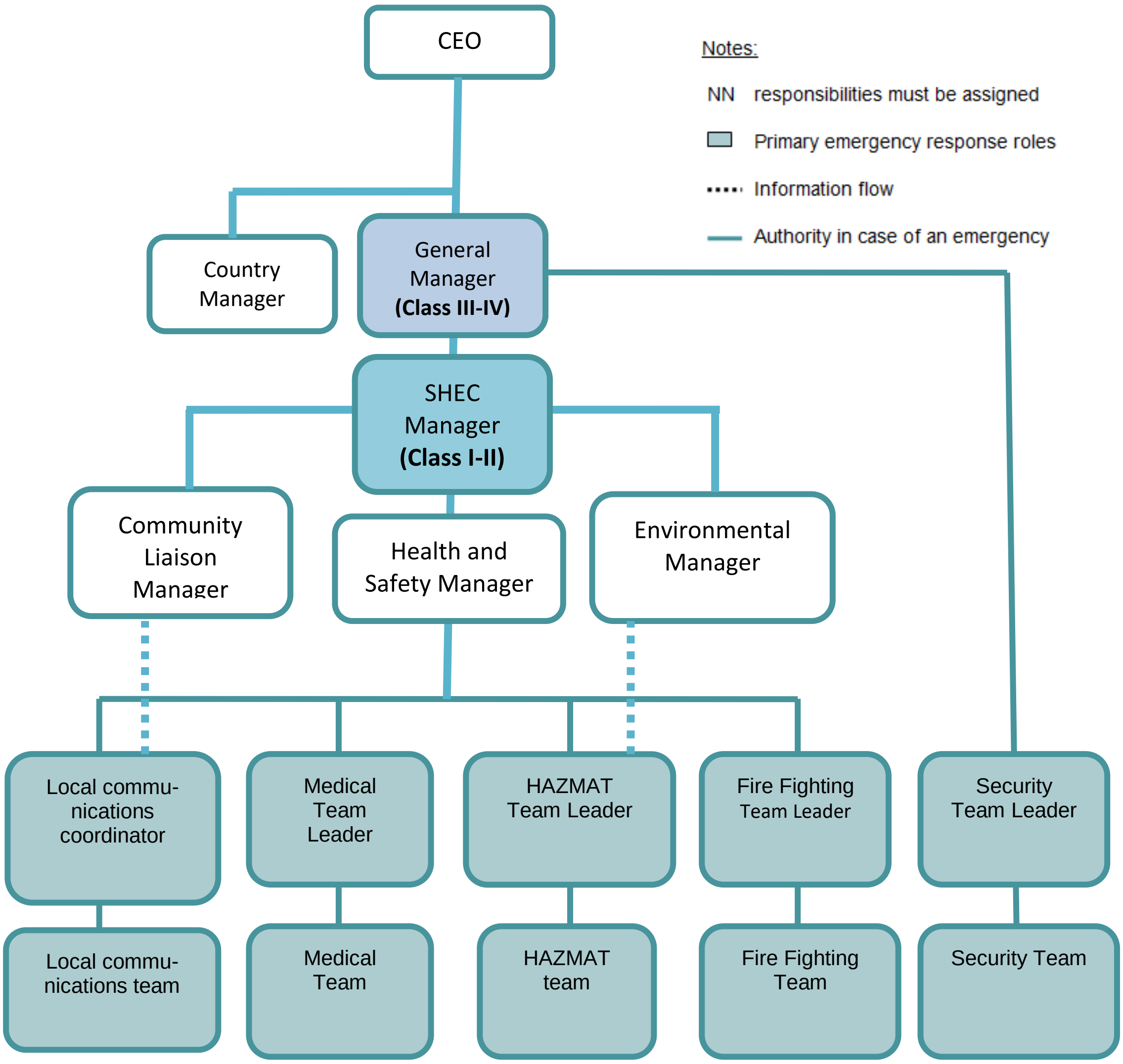
10.0 ORGANISATIONAL RESPONSIBILITIES

10.1 Overview

Figure 10-1 provides an overview of the organisational structure of Perseus and the information flows. The solid blue boxes indicate primary roles during an emergency.

The General Manager is responsible to Perseus's CEO for ensuring that Perseus's emergency response teams have the proper staffing, training, equipment, and other resources to effectively respond to, control, and recover from all plausible emergency situations occurring at the Project site, or, where shipment of project material or equipment is involved, the transportation corridors to the site.

Figure 10-1 Perseus's emergency preparedness and response organisation


CEO
Notes:
NN responsibilities must be assigned
Primary emergency response roles
Information flow
Authority in case of an emergency
Country Manager
General Manager (Class III-IV)
SHEC Manager (Class I-II)
Community Liaison Manager
Health and Safety Manager
Environmental Manager
Local commu-nications coordinator
Medical Team Leader
HAZMAT Team Leader
Fire Fighting Team Leader
Security Team Leader
Local commu-nications team
Medical Team
HAZMAT team
Fire Fighting Team
Security Team

It is important that at least one alternate (deputy) Emergency Coordinator is designated that can stand in if the Emergency Coordinator is unavailable. In practice this would be the plant operations manager, mine operations manager of comparable senior managerial functions.

The major responsibilities and training or qualification requirements for key emergency response staff are described in the following paragraphs, along with general requirements applicable to first responders (i.e., Project or contractor staff and security personnel who are the first to observe and/or report an emergency situation).

10.2 Emergency Coordinator

10.2.1 General Responsibilities

The Emergency Coordinator is the person responsible for all aspects of an emergency response; including quickly developing incident objectives, managing all incident operations, application of resources as well as responsibility for all persons involved. The Emergency Coordinator sets priorities and defines the organization of the incident response teams and the overall incident action plan. The Emergency Coordinator may, at his/her own discretion, assign individuals, to subordinate or specific positions for the duration of the emergency, especially in more complex situations under Incident Levels III and IV.

By default, the General Manager will be the Emergency Coordinator. The General Manager is the first point of contact when an emergency call is placed through Security. Security will notify the General Manager and provide details to him/her regarding the nature of the incident and the tentative Incident Class.

The General Manager will take control in all serious emergencies, set up a control centre and appoint the relevant managers according to the event.

Depending on the emergency level, the General Manager may designate the SHEC Manager as Emergency Coordinator for Incident Classes I and II (see Sections 9.1 and 9.2) provided that they are capable of being resolved expeditiously, whereas in more complex emergency situations, particulary Incident Classes III and IV the General Manager is the Emergency Coordinator.

Incidents that typically require a greater level of management engagement and would therefore reduce or impair the Emergency Coordinator’s ability or availability to properly respond to and manage other potential emergencies in other site or transportation corridor locations. Therefore, the General Manager would take charge of coordinating the response to these serious incidents as Emergency Coordinator.

The Emergency Coordinator shall:

- Ensure that emergency response teams (i.e., the fire fighting team as well as HAZMAT and medical response teams) are in place for each operating shift and that all emergency response team members have received appropriate training;

- Work with the emergency response teams to ensure that appropriate inventories of response equipment is available at key locations as well as in Perseus and contractor vehicles;

- Conduct emergency response exercises periodically to test the performance of the emergency response teams and all involved employees, including evacuation drills. These exercises and drills shall also include representative community emergency response organisations, consistent with the requirements of applicable community emergency plans. The scope and frequency of these drills is discussed further in Section 20.0 and the corresponding Training Materials (see Section 3.2);

- Ensure that this Plan is reviewed, updated and approved on at least an annual basis and after each emergency incident to ensure that it is appropriate for the current circumstances of the Project and is well coordinated with applicable community emergency plans ; and

- Maintain a current list of all externally distributed printed copies of the Plan, as noted on in Section 21.1.

The Emergency Coordinator and all designated alternates must be trained in, and be familiar with, the following:

- The entire contents of this Plan;

- All emergency preparedness and response SOPs cited herein;

- The location and capabilities of all emergency response equipment and other of Perseus's or contract miners' equipment (e.g., dozers, backhoes, trucks) that may be required during an emergency;

- All hazardous materials, chemicals, wastes on-site and their locations;

- The overall layout and routine operations of the process plant, ancillary facilities, and construction or excavation operations;

- The emergency response teams, team members, and capabilities;

- Maintenance or operations personnel who know the locations of all utility shut-offs and process shutdown functions; and

- The overall emergency response capabilities of commercial contractors as well as local, regional, and national governmental emergency response organisations.

The Emergency Coordinator is specifically delegated the authority for selecting and assigning properly qualified and trained personnel or contractors. The Emergency Coordinator shall maintain a list of all trained personnel; the list shall be reviewed and updated on at least an annual basis.

The Emergency Coordinator notifies or instructs other corporate managers during an emergency with respect to the following actions:

Table 10-1 Managers and actions in an emergency

Managerial position	Actions (examples)
HR	Notification of next-of-kin or other emergency contacts of employees
Environment	Advice on environmental issues, hazardous materials Organisation of clean-up of spills
Community Relations	Information of affected communities (possibly after high level information of Town Chief and Préfet/Sous-préfet by General Manager)
HAZMAT team leader	Response, mitigation and cleanup actions where hazardous materials are involved
Medics team leader	Medical emergencies, injuries, smoke poisoning, cyanide accidents
Fire-fighting team leader	Incidents involving fires, evacuations
Security	Evacuations, cordoning off the site, access control

The Emergency Coordinator is also responsible, with the assistance of the Community Liaison Manager, for establishing and maintaining effective working relationships with community emergency response organisations (from communities near the mine site as well as communities along major transportation corridors), for holding copies of applicable community emergency response plans, for coordinating response activities in conjunction with community emergency plans when circumstances so require, and for the periodic review and update of this Plan to ensure its continued suitability and effectiveness with respect to changing community emergency plan needs.

10.2.2 Responsibilities during an Emergency

The Emergency Coordinator shall:

- Rapidly gather information from the first responder and other sources as necessary to confirm if an emergency exists and to assess the Level and type of emergency, sound all required alarms as warranted by the situation, determine what resources are likely to be needed;
- Notify the appropriate emergency response team(s) for mobilisation to the emergency site (i.e., the fire fighting team, HAZMAT team, and/or medical team);
- Physically direct the actions of all emergency personnel, and ensure appropriate communication and co-ordination between and among Perseus's emergency response teams and any external community emergency response organisations (e.g., fire fighters, police, medics) as they arrive on the scene;
- Evaluate the risk that fires, explosions, and hazardous chemical/waste releases may occur, recur, or spread, and direct emergency responders and/or employees to cease operations or move as necessary to protect their safety;

- Make the initial determination of the alarm(s) that shall be sounded and initiate the appropriate alarm systems through Security;

- If a particular facility or process areas ceases operations in response to fire, explosion, or hazardous waste release, ensure that monitoring for leaks, pressure build-ups, gas generation, or ruptures in valves, pipes, or other equipment is initiated;

- The Emergency Coordinator shall decide which emergency response equipment, either on-site or off-site, and any on-site mining or operating equipment is needed to appropriately respond to the emergency. The Emergency Coordinator shall direct use of the equipment by the emergency responders;

- Ensure the community representatives (Town Chiefs) of potentially or actually affected communities, and the Sous-préfet of Bouaflé are notified, if this is necessary (typically in an Emergency Class III and IV). If information must be provided to community representatives in an emergency where the SHEC Manager is acting as Emergency Coordinator (typically in an Emergency Class III and IV), the General Manager is responsible for the community communication;

- Suspend Permits to Work (PTW) as appropriate;

- Mobilise to the emergency site, co-ordinate with security to establish site access controls/barriers, initiate any required evacuations and remain on site until the appropriate emergency response team arrives;

- Liaise as necessary with the Community Liaison Manager and the Environmental Manager;

- In the event that a Level IV emergency is declared, work with the Community Liaison Manager and affected community emergency response organisations to determine if external evacuations are necessary, and to initiate such evacuations when required;

- Provide support to the Community Liaison Manager (if required) in the preparation of fact sheets, press releases, and other public statements concerning the emergency;

- Provide information as necessary to ensure that the SHEC Manager has the information necessary to support any specific regulatory reporting requirements;

- Confirm that all staff on site are accounted for;

- Instruct site security as to which external emergency response organisations, personnel, or equipment will be allowed on site and to whom they shall report;

- Ensure that all non-Perseus or non-Perseus-contractor personnel are escorted at all times.
- Issue “All Clear” Alarm;
- Document the incident including date, times, information gathered, and persons providing information;
- Closeout the emergency response by signing the log sheet;
- Remain in control of the site until the emergency is determined to be contained, e.g., medical responses to any injured personnel are complete, fires are extinguished, spills are contained, other emergency situations are under full control, and the chance of recurrence is deemed minimal;
- Ensure PTWs are reinstated after an emergency; and
- Prepare Post-Emergency Response Report and maintain log sheets.

Once the emergency is determined to be stabilised or resolved, the Emergency Coordinator shall:

- Ensure that the incident is documented and thoroughly investigated;
- Initiate formal corrective and preventive action processes; depending on circumstances, such actions may include additional cleanup or remediation, refinement of the requirements of this Plan or its supporting procedures, training or re-training of personnel, engineered improvements, or other appropriate actions;
- With the assistance of the Community Liaison Manager, conduct incident closeout communications with any community emergency response personnel or public meetings; and
- Ensure that all emergency equipment is cleaned or replaced, and is fit for use before any operations that may have been halted by the incident are resumed.

10.3 First Responders

Any Perseus or contractor employee that observes or is advised (from non-Perseus sources) that a potential emergency exists is considered a “first responder”. The primary responsibility of all first responders is to immediately summon help by dialing Perseus Security (see Table 19-1) on any facility phone, or by mobile phone or two-way radio on the channel indicated.

Security will immediately contact the General Manager (default Emergency Coordinator); the employee should then call or report directly to his/her supervisor. It is imperative that employees that are not properly trained shall not attempt to intervene in or contain an emergency situation. After reporting the incident, first responders should

- Do **not** approach the emergency site unless directed to do so;
- Be prepared to evacuate and follow evacuation procedures as provided in SOP "Evacuations"; and
- Provide assistance only when directed to do so by the Emergency Co-ordinator or other emergency responders.

The actions of those employees who first encounter an emergency situation may well determine the severity of the impact on human health and the environment. Therefore, it is critical that all employees understand the basic requirements for response to emergency situations. In addition, all Perseus employees shall be trained in the occupational health and safety procedures established by the Perseus Health and Safety Plan many of which may require consideration in emergency situations.

10.4 Emergency Response Teams

Perseus maintains HAZMAT (spill response) and medical teams. The following sub-sections provide a description of the roles and responsibilities of employees and emergency responders.

A Team Leader and an alternate Team Leader shall be assigned to every Emergency Response Team.

10.4.1 Emergency Response Team Leader Responsibilities

The Team Leader shall perform the following tasks as far as practicable, in the sequence indicated:

- Ensure all emergency equipment is maintained in a state of readiness
- Mobilize the respective Emergency Response Team;
- Remove staff from the affected area to a safe place in case no general muster takes place;
- Take charge and direct rescue, fire fighting and first aid;
- Request through Emergency Response Coordinator additional support if needed;
- Continuously advise the Emergency Response Coordinator on the situation;
- Upon completion check equipment for damage and consumables used and inform Emergency Response Coordinator on repairs required and replenishment of consumables;
- Guide evacuation;

- Count evacuated staff with help of own and Contractor Supervisors; and
- Keep staff at the muster point(s) informed about the situation.

10.4.2 Emergency Response Team Members Responsibilities

The Team members will have the following general tasks:

- When alarm sounds muster at Emergency Response Team muster point;
- Prepare necessary equipment;
- Wait for instructions from Emergency Response Team Leader; and
- Follow instructions.

10.4.3 HAZMAT Spill Response Team

HAZMAT spill response team members shall be available on site during all shifts and during all phases of the Project in order to effectively respond to emergencies involving spills or releases of hazardous chemicals, substances, or wastes. Personnel trained to be on the HAZMAT team may also be trained as members of the fire fighting team, and/or the medical team and therefore may have several responsibilities during an emergency situation.

HAZMAT team members shall receive all of the basic health and safety training required for all Perseus employees, as well as speciality training in firefighting methods and equipment use. HAZMAT team members shall also participate in regular spill response drills, as directed by the Emergency Coordinator or the SHEC Manager, and shall perform periodic HAZMAT spill response equipment inspections and tests per SOPs “Emergency Response Equipment - Maintenance, Inspections, and Testing” and “Fire and Electrical Risks”.

10.4.4 Medical Emergency Response Team

Medical team members shall be available on site to respond to emergencies involving injuries, illness, or death of employees, visitors, or contractors on the site. It is understood that persons trained to be on the medical team may also be trained as members of the fire fighting team, and/or the HAZMAT team and therefore may have several responsibilities during an emergency situation. Medical team members shall receive all of the basic health and safety training required for all Perseus employees, as well as more advanced medical emergency training to enable a proper response to medical trauma and other life-threatening situations.

Medical team members shall also participate in regular spill response drills, as directed by the Emergency Coordinator or the SHEC Manager, and shall perform periodic medical response equipment inspections and tests per SOP “Emergency Response Equipment - Maintenance, Inspections, and Testing.”

The Perseus ambulance is ready for evacuation to hospitals and health centres in Angovia, Kossou, Bouaflé and Yamoussoukro. Perseus's ambulance is maintained and operated by Perseus personnel.

10.4.5 Fire Fighting

As there is no formal Fire Department within a practical distance from the project area, Perseus will provide their own, appropriately trained and equipped, fire fighting team, consisting of volunteers that are mobilised.

Selected volunteer Perseus employees shall receive all of the basic health and safety training required for all Perseus employees, as well as specialty training in fire-fighting methods and equipment use. They should also participate in regular fire-fighting drills, and shall perform periodic fire-fighting equipment inspections and tests.

10.4.6 Community Liaison Manager

The Community Liaison Manager shall assist the Emergency Coordinator and Perseus's response teams in the response to and resolution of all emergencies that may have potential offsite impacts (by definition Level III and IV). Key responsibilities include the following:

- Preparation and update of incident-specific fact sheets, under the instruction by the Emergency Coordinator and with the assistance of other Project staff, that provide general information about the incident that shall be consistently used as the basis for communicating with external stakeholders, the public, and the media; and

- Assisting the Emergency Coordinator in communicating evacuation needs to affected stakeholders or the public.

The Community Liaison Manager shall assist the Emergency Coordinator in conducting incident closeout communications with any community emergency response personnel or public meetings.

10.4.7 Operations Department

The Operations Department may be asked to play a role in emergency situations. Typical responsibilities include:

- Shut down process operations according to pre-determined shutdown procedures;

- Shut off gas, water and electricity as appropriate;

- Provide auxiliary emergency response equipment. Various resources will be made available to support the needs of personnel and business groups during an emergency such as;

  - Mobile equipment
  - Pumps
  - Telecommunications/pa/video
  - Restroom facilities
  - Portable lighting
  - Other
- Bringing the process plant, TSF, or other Project operations back on line according to pre-determined procedures; and
- Perform cleanup activities.

10.5 Other Departments with an important role in an emergency

10.5.1 Security

Security Department will play a key role in the management of all onsite emergency situations. Typical responsibilities include the following:

- Responding to all emergency calls to the Security number (see Table 19-1) as well as all direct mobile phone and two-way radio contacts. The security staff member taking the call will immediately contact the General Manager and document the information provided;
- Logging the details of the incident including date, times, basic information about the emergency, and the name of the first responder; incident logs shall be retained in the ESMS records.
- Security shall assist the Emergency Coordinator by establishing a site control perimeter; this may be accomplished by locking gates or doors; by setting up temporary barriers, flashing lights, or placards; or by other appropriate means;
- Individuals located inside the security perimeter will be informed of the emergency situation and evacuated to a safe location;
- Security officers will control ingress and egress from the emergency site as directed by the Emergency Coordinator; a log will be maintained documenting all personnel entering or leaving the site;
- Security officers will assist in evacuation and crowd control as necessary to ensure that any required evacuation is conducted in an orderly fashion;
- Security Officers will assist evacuation and crowd control to ensure that the evacuation is conducted in an orderly fashion; and

- Security officers will provide escorts to regulatory agency staff or other outside parties should visits to the emergency site be required.

10.5.2 Environmental Department

The Environmental Department plays a key role in all emergency situations. Typical responsibilities include the following:

- Assist Emergency Coordinator in determining nature and scope of incident;
- Will evaluate the nature and scope of the emergency situation and its ramifications, and will determine the range of possible adverse consequences to human health and the environment. The emphasis is on prevention of further damage to the environment;
- Immediately act to mitigate existing adverse impacts, and develop control strategies and tactics to prevent or reduce the risk of additional damage to the environment;
- Provide immediate technical field support;
- Provide technical and regulatory evaluation and interpretation of available information to the Emergency Coordinator to define the extent of the problem, and to assist the emergency response teams in mounting an effective response to the situation;
- Provide the public communications coordinator with technical and layperson interpretations of information for use in advising senior management, preparing media statements, and other community relations activities;
- External regulatory notification
    - The release of hazardous wastes exceeding certain thresholds established by law requires the notification of various regulatory agencies in a timely manner. The Environmental Department will initiate and conduct this notification procedure. Information should be gathered concerning the emergency using an Emergency Response Incident Report. This communication to the agency shall be properly documented.
    - The Environmental Department will establish liaison with relevant environmental agencies (ANDE, CIAPOL, CIPOMAR[2]) to ensure that the situation is being managed in an expeditious and appropriate manner consistent with regulatory guidelines.
- Collect environmental samples

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[2] if the Bandama river is affected

    - The Environmental Department will direct the collection of samples of uncontained materials that could pose a threat to human health or the environment.

    - Basic analysis of the samples will be conducted by an approved laboratory. The Environmental Department will arrange for the transportation of environmental samples to such a laboratory and be responsible for sample QA/QC.

    - Information received from initial tests and subsequent laboratory analysis will be used to help determine appropriate control measures and corrective actions.

- Evaluate potential environmental impacts

    - In the event of a release of hazardous wastes which could potentially impact the health and safety of employees, the surrounding community, or the environment, the Environmental Department will evaluate the potential impacts of such situations and will devise control measures to avoid or minimise their consequences.

    - In the event of a hazardous waste spill or release, the Health and Safety Department would monitor the airborne concentrations and make recommendations to evacuate the area.

- Support control activities

    - The Environmental Department will provide technical support and direction to the Emergency Coordinator, environmental contractors, and other support groups conducting any required environmental control, clean-up or remediation activities.

- Corrective actions

    - The Environmental Department will guide all environmental corrective actions in order to ensure a timely, safe and effective resolution of the emergency situation, including any subsequent environmental compliance or remediation activity.

10.5.3 Health & Safety Department

The Health and Safety Department will be responsible for the following:

- Incident Investigation

    - In any emergency situation as deemed necessary by the Emergency Coordinator, the Safety Department would investigate the incident to determine whether safety hazards were present.

  - Provide recommendations for the protection of personnel from the safety hazard, and for the removal of the hazard.

  - Determine whether unsafe conditions or unsafe acts contributed to the incident. The Health and Safety Department would also provide advice to prevent unsafe practices from making the situation worse.

- Material Safety Data Sheets Hazard Evaluation

  - The Safety Department maintains Material Safety Data Sheets (MSDS) on all chemicals used on the Project. Anyone with access to the database can call up Material Safety Data Sheets for read-only browsing.

  - Hard copies of the MSDS' are located in the Safety Department and in all departments that use hazardous chemicals.

  - In the event of a hazardous waste spill or release, the Safety Department will retrieve the appropriate MSDS', and will interpret the data as it relates to safety, health and the environment.

  - The Safety Department will evaluate the hazardous waste spill, leak or release for its potential to produce harm to surrounding employees and will determine whether evacuation of personnel is necessary.

  - The Safety Department will determine the proper personal protective equipment required for emergency personnel remaining at the scene of the release.

- The Safety Department will notify all employees and other affected persons of the hazards and potential hazards resulting from the emergency situation.

10.6 Process Control and Verification by Foremen and Workers

Employees will, as soon as they observe that process data are critically approaching or exceeding the established safety margins of the operation, inform the shift foreman who, after having confirmed this, immediately informs the responsible person in the department/plant in order for him/her to adjust the process and effect corrective action. Such communication is documented in column "Notes and Comments" of the Daily Log Sheet.

The shift foreman of each work area (mine, process plant, waste management etc.) instructs the personnel, monitors the execution of the process and at the end of the shift verifies if all required data are recorded and no abnormal data indicating process deficiencies had occurred, which may be an indicator of an imminent emergency.

In case deficiencies are detected, these are described in the column "Notes and Comments" of the Daily Log Sheet.

11.0 CO-ORDINATION WITH EXTERNAL EMERGENCY RESPONSE

11.1 External Emergency Response Plan

It is assumed that there is also a community (“external”) emergency plan that will be activated as required in conjunction with this Plan.

The community emergency plan should provide guidance for community officials, emergency response personnel, and nearby businesses and residents with guidance on emergency preparedness and response in the event of an emergency that could impact the environment or off site populations as well as other potential emergencies the community might face.

11.2 External Notification of Emergency Situations

In the event of an emergency situation, there are often notifications to off-site personnel and organisations that must be made. These notifications typically fall into three categories:

- Notifications to regulatory agencies concerning releases to the environment or injuries to employees;
- Notification to implement off-site emergency response actions; and
- Notifications to local officials, media, and employee family members.

Table 19-2 provides the contact details of external response units and authorities.

Certain releases to the environment and/or injuries/deaths to employees must be reported to outside regulatory agencies. Usually, these reports must be made to the regulatory agencies in an expedient manner. Therefore, it is important that such information is gathered promptly during an emergency. The Emergency Coordinator will be responsible for gathering reportable information during an emergency. The Environmental Manager shall be responsible for ensuring that reports concerning environmental releases are reported in a complete and timely manner. The H&S Manager shall be responsible for ensuring that reports concerning employee injuries and/or deaths are reported in a complete and timely manner.

The Emergency Coordinator shall be available or have an alternate available for response to report emergencies on a 24-hour per day basis. He/she should ensure the following actions are taken:

- Confirm the facts of the emergency by getting information from the initial observers of the emergency, first responders, or others having knowledge of the emergency;
- Complete the Emergency Response Incident Log Sheet;

- Make the final determination on whether the notification to off-site emergency response organisations is appropriate; and
- Make the verbal reports to all appropriate outside emergency response organisations as soon as possible per this procedure.

The following agencies and community leaders may need to be informed, depending on the details of the emergency:

- Bouaflé/Yamoussoukro Police;
- ANDE, CIAPOL, CIPOMAR (if the Bandama river is affected);
- The Angovia health centre and other health centres and hospitals, e.g., in Kossou, Bouaflé and Yamoussoukro (should the Angovia health centre not be able to cope with the given injuries, or number of affected people); and
- Other executive organs of Yamoussoukro and Abidjan.

When making an emergency response notification to a governmental agency, the following shall be reported:

- Name of person calling;
- Phone number where you can be reached;
- Location of emergency;
- Company responsible for the emergency;
- Company address;
- Company phone number;
- Date, time and duration of spills or releases;
- Material spilled;
- Amount spilled;
- Cause of spill;
- Weather conditions including wind speed and direction;
- Number of injuries or fatalities;
- Known or anticipated acute or chronic health risks from the released material;
- Fire or explosions associated with spill;

- Impacts on soil, surface water, air, etc;
- Whether or not outside emergency response is needed;
- Whether or not evacuations of employees or public is needed;
- Status of release, i.e. has release been stopped;
- Clean up actions taken or planned; and
- Other agencies/organisations contacted.

The following shall be documented by the Emergency Coordinator or the person notifying the agency:

- Name of person taking call;
- Date and time of call; and
- The information provided during the notification.

12.0 EMERGENCY ALARMS AND COMMUNICATION SYSTEMS

In the event of an emergency situation at the Project, the emergency response system would be initiated. This process involves the following steps:

- The event is observed by an individual or detected by a sensing device;
- Security is notified on a Project site phone, or sensing device sounds alarm;
- Security notifies General Manager (i.e., the default Emergency Coordinator) and other departments as deemed necessary;
- The General Manager begins a log of the incident including date, times, information gathered, and persons providing information. This log shall be maintained throughout the emergency;
- The General Manager shall quickly assess the class of emergency, and if appropriate (especially in Incident Classes I and II) designate the responsibility of Emergency Coordinator to the SHEC Manager;

Once the Emergency Coordinator has been designated, he/she has the following responsibilities:

- The Emergency Coordinator shall determine what resources are likely to be needed, if emergency response team(s) are required to respond, and the classification of the incident (see Section 8.0). If necessary, the Emergency Coordinator shall contact the individual who first observed the emergency or first responders to gather more information and provide immediate instructions;

- The Emergency Coordinator shall make the initial determination of the alarm(s) that shall be sounded and initiate the appropriate alarm systems;
- Security personnel shall sound the appropriate alarm as directed by the Emergency Coordinator; and
- The Emergency Coordinator shall then notify the appropriate emergency response team(s) that should respond to the emergency site, e.g. the employees specially trained for fire fighting, until the arrival of the fire fighting team, HAZMAT team, or medical team.

The following sections describe the emergency alarm and communication systems.

12.1 Internal Alarm Systems

Alarms shall be so located and of sufficient volume to be clearly audible in all areas of the Project, including mining areas, processing areas, storage areas, and administrative office areas when triggered. Its volume shall be high enough to be heard under air conditioner noise. The alarm system will notify employees of Level II through IV emergencies, including the need for evacuations.

Local area evacuations may also be triggered by verbal instructions of supervisors, first responders or other emergency response personnel.

12.2 External Alarm Systems

Perseus will co-ordinate with communities downgradient and/or downwind of the Project in which potential Level IV incidents may require community evacuations to consider that they are equipped with a proper alarm system. The decision to trigger any community alarm system in the event of a Level IV emergency at the Project site will be made by the Sous-préfet of Bouaflé with input from the Perseus Emergency Coordinator (i.e., the General Manager in a Level IV emergency).

12.3 Internal Communication Systems

Normal Project site communications rely on mobile phones and portable radios (Security chief and Head of Safety). The primary Emergency Coordinator and Emergency Coordinator alternates will carry mobile phones when off-site and on-call.

12.4 External Communication Systems

All outside emergency communications will be conducted via mobile phone. Satellite phones will be available as a backup system.

12.5 Site Map and Sign Posting

Simplified site maps showing emergency equipment locations, major escape routes, muster points, and medical post(s) will be visibly displayed around site. Detailed maps are located at the Command Center. Muster points, escape routes and medical post(s) are clearly marked.

12.6 General Provisions

It must be understood that every emergency situation is different and the approach to response varies significantly depending on the location, the materials and personnel involved, weather conditions, and other variables. The first priority in any emergency situation is the safety of the employees, first responders, and any other persons potentially exposed to the hazards associated with the emergency. No employee, visitor, or contractor on site should respond to an emergency by taking actions for which they are not trained or qualified which puts them or others at risk.

For those employees that are not first responders or associated with the emergency in any way, it is imperative that they:

- Go to the muster point unless instructed otherwise by means of voice or alarm communications;
- Do **not** approach the emergency site unless directed to do so;
- Be prepared to provide assistance only when directed to do so by the Emergency Coordinator or other emergency responders.

12.7 Emergency-Specific Actions

12.7.1 Fire

First Responder Actions

First responders should not attempt to fight fires other than small fires, e.g. a fire in a waste basket, which can be easily put out with a portable fire extinguisher and then only if the first responder has had portable fire extinguisher training. Every fire should be reported, even small fires after being extinguished, by dialing the security number indicated in Table 19-1. For fires that cannot be easily extinguished with a portable fire extinguisher, the first responder should take the following actions:

- Get away from the fire and any other hazards;
- When at a safe disctance from the hazard, quickly try to identify the extent of the situation, i.e. how large is the fire;
- Get help from qualified emergency responders by dialing the security number or by two-way radio on the Channel indicated in Table 19-1;
- Seal off the area and vocally alert others of possible dangers and/or triggering stationary building fire alarms;
- Look for any injured personnel, including taking time to examine yourself;

- Remain in a safe location where you can provide additional information to the fire fighters once they arrive;

- Be prepared to receive and follow instructions from the Emergency Coordinator or other emergency responders;

Emergency Response Team Actions

- The Medical Team may be required to treat smoke poisoning symptoms, burns, and bruises.

- Determine when the emergency is under control and notify the Emergency Coordinator that the emergency is over.

12.7.2 Potential Cyanide Release in the Process Plant Area

Uncontrolled cyanide release in the Process Plant and associated facilities (storage tanks, holding ponds, pipelines) may be caused by the following scenarios:

- Operator error and/or equipment failure leading to rupture of container tanks of solid sodium cyanide during off-loading and initial process solution mixing, and subsequent contact of cyanide with precipitation or other low to neutral pH water source;

- Operator error during process solution mixing that would introduce low to neutral pH water into the container tank;

- Temporary loss of process pH control systems; and

- Failure or leaks from tanks, pipelines, couplings, valves, or secondary containment systems; power outages and pump failures occurring simultaneously with malfunctions of pump interlocks and high-level switches.

These scenarios require the immediate implementation of Level III or Level IV procedures, depending on the potential for offsite impacts; if Level IV, immediate co-ordination by the Perseus Emergency Response Team and with the nearest local emergency response organization.

First Responder Actions

First responders should not attempt to halt a release of cyanide solution unless the responder has received the necessary training and can do so with no risk to his own safety. Every release of cyanide solution should be reported, even a minor release that can be readily halted, by dialing the security number indicated in Table 19-1.

For releases that cannot be safely stopped, the first responder should take the following actions:

- Avoid contact with released cyanide solution and prevent contact with water if at all possible;
- If the release is in the dissolution area, sound the emergency alarm;
- Quickly try to identify the extent of the release if possible without risk to his/her own safety;
- Get help from qualified emergency responders by dialling the security number indicated in Table 19-1;
- After putting on necessary personal protective equipment, remove any exposed persons from contact with the cyanide solution;
- Remove any contaminated clothing and wash exposed person with water from hose or safety shower;
- Administer medical oxygen if exposed person has symptoms of cyanide poisoning;
- Prevent others from entering area and contacting solution;
- Remain in a safe location where you can provide additional information to the medical team once they arrive; and
- Be prepared to receive and follow instructions from the Emergency Co-ordinator or other emergency responders.

Emergency Response Team Actions

Upon arrival at the emergency site, the emergency response team will typically follow the following general steps, recognising that all situations are different and may call for different actions, such as the following:

- Clearly identify/acknowledge the Emergency Coordinator;
- Initiate local area/building evacuation to clear area of unnecessary personnel;
- Quickly try to identify the extent of the release;
- Seal off the area and alert others of possible dangers;
- Identify emergency response equipment needed, including personal protective equipment, and what emergency response equipment is immediately available;
- Call for additional help, resources, and emergency response equipment if required;

- After putting on necessary personal protective equipment, remove any exposed persons from contact with the solution;
- Remove any contaminated clothing and wash exposed person with water from hose or safety shower;
- Administer medical oxygen if exposed personnel have symptoms of cyanide poisoning;
- Halt release at source if possible;
- Construct earthen dikes, berms and/or temporary diversions to contain the release and prevent it from reaching natural surface water; and
- Determine when the emergency is under control and notify the Emergency Coordinator that the emergency is over.

12.7.3 Failure of Cyanide Detoxification

First Responder Actions

First responders in this scenario are typically personnel in the process plant who are familiar with the proper operation of the systems. Examples of malfunction may include unusually low pH that may lead to the release of gaseous hydrogen cyanide (HCN) into the air.

Typical first responder actions for a failure of cyanide treatment, destruction or would involve the following steps:

- Avoid contact with released cyanide solution and prevent contact with water if at all possible;
- Quickly try to identify the extent of the release, i.e., how much untreated solution may have left the plant;
- Get help from qualified emergency responders by dialing the security number or by two-way radio on the Channel indicated in Table 19-1;
- Put on necessary personal protective equipment if there is a risk of high concentrations of HCN in the air;
- Remove any exposed persons from areas with potentially high HCN concentrations in the air;
- Administer medical oxygen if exposed person has symptoms of cyanide poisoning;
- Prevent others from entering area;

- Remain in a safe location where additional information can be provided; and
- Be prepared to receive and follow instructions from the Emergency Coordinator or other emergency responders.

Emergency Response Team Actions

Upon arrival at the emergency site, the emergency response team will typically follow the following general steps, recognising that all situations are different and may call for different actions, such as the following:

- Clearly identify/acknowledge the Emergency Coordinator;
- Initiate local area/building evacuation to clear area of unnecessary personnel;
- Quickly try to identify the extent of the release;
- Seal off the area and alert others of possible dangers;
- Identify emergency response equipment needed, including personal protective equipment, and what emergency response equipment is immediately available;
- Call for additional help, resources, and emergency response equipment if required;
- After putting on necessary personal protective equipment, remove any exposed persons from areas with potentially high HCN concentrations in the air;
- Administer medical oxygen if exposed personnel have symptoms of cyanide poisoning;
- Identify cause of the failure (electrical, mechanical failure of pumps, pH sensors etc., unless already identified by First Responders) and bring circuits and equipment back to normal operating parameters;
- Construct earthen dikes, berms and/or temporary diversions to contain the release and prevent it from reaching natural surface water; and
- Determine when the emergency is under control and notify the Emergency Coordinator that the emergency is over.

12.7.4 TSF Dam Failure and Tailings Spillover

First Responder Actions

Typical first responder actions for a TSF failure would involve the following steps:

- Be aware of further potential failures and get away from any potential downgradient failure areas;

- Quickly try to identify the extent of the situation, e.g. are there any injuries, burials, or drownings;
- Get help from qualified emergency responders by dialling the security number or by two-way radio on the Channel indicated in Table 19-1;
- Seal off the area and alert others of possible dangers;
- Remain in a safe location where you can provide additional information to the emergency responders once they arrive;
- Be prepared to receive and follow instructions from the Emergency Co-ordinator or other emergency responders;
- Support the Emergency Coordinator in locating and commandeering emergency response equipment, including mine equipment such as excavators, loaders, haul trucks, or bulldozers; and
- Once the emergency is declared over by the Emergency Coordinator, he/she shall take control to co-ordinate documentation, cleanup, and return to normal operational state.

Emergency Response Team Actions

Upon arrival at the emergency site, the emergency response team will typically comply with the following general steps, recognising that all situations are different and may call for different actions:

- Clearly identify/acknowledge the Emergency Coordinator;
- Quickly try to identify the extent of the situation, e.g. injuries;
- Seal off the area, including above and below the unstable area of the dam, and alert others of possible dangers;
- Take the time to quickly identify other existing and potential hazards;
- Identify emergency response equipment needed and what emergency response equipment is immediately available including mine equipment such as excavators, loaders, haul trucks, or bulldozers;
- Particular attention shall be given to potential contamination of drinking water supply downstream the spill, and alternate drinking water supply (bottled water, tank trucks) should be considered as appropriate;
- Prepare a plan of action;
- Call for additional help, resources, and emergency response equipment if required;

- Communicate with the Emergency Coordinator about the extent of the emergency;
- Carry out the plan of action to bring the emergency situation under control; and
- Determine when the emergency is under control and notify the Emergency Coordinator that the emergency is over.

12.7.5 Tailings Pipeline Rupture

First Responder Actions

Typical first responder actions for a tailings pipeline rupture would involve the following steps:

- Get away from the spill and remain in a safe location;
- Contact the plant and tell them to turn off the pumps;
- Quickly try to identify the extent of the situation, i.e. what amount of tailings has already been spilled, are there any injuries;
- Get help from qualified emergency responders by dialing the security number or by two-way radio on the Channel indicated in Table 19-1;
- Seal off the area and alert others of possible dangers;
- Remain in a safe location where you can provide additional information to the emergency responders once they arrive; and
- Be prepared to receive and follow instructions from the Emergency Coordinator or other emergency responders.

Emergency Response Team Actions

Upon arrival at the emergency site, the emergency response team will typically follow the following general steps, recognising that all situations are different and may call for different actions.

- Clearly identify/acknowledge the Emergency Coordinator;
- Quickly try to identify the extent of the situation;
- Seal off the area, including above and below the pipeline rupture, and alert others of possible dangers;
- Take time to identify other existing and potential hazards;

- Identify emergency response equipment needed and what emergency response equipment is immediately available including mine equipment such as excavators, loaders, haul trucks, or bulldozers for cleanup action;

- Prepare a plan of action;

- Call for additional help, resources, and emergency response equipment if required;

- Communicate with the Emergency Coordinator about the extent of the emergency; and

- Determine when the emergency is under control and notify the Emergency Coordinator that the emergency is over.

12.7.6 Pit and Waste Rock Dump Slope Failures

First Responder Actions

Typical first responder actions for a slope failure would involve the following steps:

- Be aware of further potential slope failures and get away from exposed areas;

- When at a safe distance to the slope failure areas, quickly try to identify the extent of the situation, i.e. are there any injuries or burials;

- Get help from qualified emergency responders by dialing the security number indicated in Table 19-1;

- Seal off the area and alert others of possible dangers;

- Remain in a safe location where you can provide additional information to the emergency responders once they arrive; and

- Be prepared to receive and follow instructions from the Emergency Coordinator or other emergency responders.

Emergency Response Team Actions

Upon arrival at the emergency site, the emergency response team will typically follow the following general steps, recognising that all situations are different and may call for different actions.

- Clearly identify/acknowledge the Emergency Coordinator;

- Quickly try to identify the extent of the situation, e.g. burials or injuries;

- Seal off the area, including above and below the unstable area, and alert others of possible dangers;

- Take time to identify other existing and potential hazards;
- Identify emergency response equipment needed and what emergency response equipment is immediately available including mine equipment such as excavators, loaders, haul trucks, or bulldozers;
- Prepare a plan of action;
- Call for additional help, resources, and emergency response equipment if required;
- Communicate with the Emergency Coordinator about the extent of the emergency;
- Carry out the plan of action to bring the emergency situation under control; and
- Determine when the emergency is under control and notify the Emergency Coordinator that the emergency is over.

12.7.7 Explosives Accidents

Traumatic injury and/or burial of workers would be the typical worst case scenario for a blasting accident. Rescue and medical services would be the typical emergency response needs.

Failure of explosives to detonate is a special type of emergency that requires the involvement trained blasting personnel and implementation of special procedures, as set forth in SOP “Blasting Safety.”

The following guidance is provided for emergency response.

First Responder Actions

Typical first responder actions for unexpected explosive detonation would involve the following steps:

- Be aware of further potential explosions, unexploded explosives, fires, or unstable equipment and get away from exposed areas;
- When at a secure distance from the explosion and potential further explosions, quickly try to identify the extent of the situation, e.g., any potential injuries or burials;
- Get help from qualified emergency responders by dialing the security number indicated in Table 19-1;
- Seal off the area and alert others of possible dangers;

- Remain in a safe location where you can provide additional information to the emergency responders once they arrive; and
- Be prepared to receive and follow instructions from the Emergency Coordinator or other emergency responders.

Emergency Response Team Actions

Upon arrival at the emergency site, the emergency response team will typically follow the following general steps, recognising that all situations are different and may call for different actions.

- Clearly identify/acknowledge the Emergency Coordinator;
- Quickly try to identify the extent of the situation, e.g., injuries, fires, or burials;
- Seal off the area and alert others of possible dangers;
- Take time to identify other existing and potential hazards such as fires, HAZMAT releases, ignition sources, or unstable structures;
- Identify emergency response equipment needed and what emergency response equipment is immediately available including mine equipment such as excavators, loaders, haul trucks, or bulldozers;
- Prepare a plan of action, in consultation with the certified Blasting Engineer;
- Call for additional help, resources, and emergency response equipment if required;
- Communicate with the Emergency Coordinator about the extent of the emergency;
- Carry out the plan of action to bring the emergency situation under control; and
- Determine when the emergency is under control and notify the Emergency Coordinator that the emergency is over.

12.7.8 Chemical, Fuel and Waste Spills

First Responder Actions

First responders should not attempt to stop, contain, or cleanup chemical, fuel or waste spills unless he/she has had specific training to do so. For example, an operator in the acid wash circuit and properly trained to handle acid, may take first responder action to stop and contain a spill of sulfuric acid (such as shutting off a valve, plugging a drain, or righting a container, if he/she can safely do so. However, typical first responder action in the event of a chemical, fuel or waste spill will involve:

- Get away from the spill and any other hazards;
- When at a secure disctance to the spill, quickly try to identify the extent of the situation, i.e. how large is the spill, what is the source, and what is the material spilled;
- Get help from qualified emergency responders by dialing the security number indicated in Table 19-1;
- Seal off the area and alert others of possible dangers;
- Look for injured personnel, including taking time to examine yourself;
- Remain in a safe location where you can provide additional information to the fire fighting team once they arrive; and
- Be prepared to receive and follow instructions from the Emergency Coordinator or other emergency responders.

Emergency Response Team Actions

Upon arrival at the emergency site, the HAZMAT response team will typically follow the following general steps, recognising that all situations are different and may call for different actions.

- Clearly identify/acknowledge the Emergency Coordinator;
- Initiate local area/building evacuation if deemed necessary;
- Quickly try to identify the extent of the spill, the material spilled, and obtain MSDS sheet(s) for the spilled material;
- Seal off the area and alert others of possible dangers;
- Look for injured personnel;
- Take time to quickly identify existing and potential hazards including the fire/explosive hazards, potential ignition sources, or confined space hazards;
- Identify emergency response equipment needed, including personal protective equipment, and what emergency response equipment is immediately available;
- Prepare a plan of action;
- Call for additional help, resources, and emergency response equipment if required;
- Communicate with the Emergency Coordinator to address any required alarms or evacuations, or off-site/emergency reporting;

- Carry out the plan of action to bring the spill under control; and
- Determine when the emergency is under control and notify the Emergency Coordinator that the emergency is over.

12.7.9 Medical Emergencies

Medical emergencies can be confined to a single individual (such as the case of an illness, heart attack, or stroke) or can affect one or more individuals as part of a larger emergency. It is the Emergency Coordinator's responsibility to initially determine if medical support is required during an emergency. He/she shall also confirm (or revise) this judgment once at the emergency site. Medical emergencies typically require the following actions.

First Responder Actions

First responders should not attempt any sort of medical support to an injured person if such action places the responder at risk. First responders should also be aware of risks such as blood-borne pathogens when dealing with injured persons. Typically, the first responder in a medical emergency should take the following actions:

- Get/keep away from hazards, especially those that caused the injury to the victim. Even if the victim is in a hazardous location, judgment must be used prior to moving the injured person as head, back, or neck injuries can be greatly exacerbated by moving the victim;
- Quickly try to identify the extent of the injury and whether or not rendering immediate first aid and/or Cardiopulmonary Resuscitation is necessary, possible, or advisable;
- Avoid contact with bodily fluids such as blood;
- Get immediate help from qualified medical team by dialing the security number indicated in Table 19-1;
- Look for other injured persons, including taking time to examine yourself;
- Remain in a safe location, with the victim if possible, where you can provide additional information to the medical team once they arrive; and
- Be prepared to receive and follow instructions from the Emergency Coordinator or other emergency responders.

Emergency Response Team Actions

Upon arrival at the emergency site, the medical team will typically follow the following general steps, recognising that all situations are different and may call for different actions.

- Clearly identify/acknowledge the Emergency Coordinator;

- Quickly try to identify the extent of the injuries and if there are other victims or hazards;
- Take time to identify existing and potential hazards including the potential for fire, explosions, or hazardous liquids or gases;
- Identify emergency response equipment needed and what emergency response equipment is immediately available;
- Prepare a plan of action;
- Call for additional help, resources, and emergency response equipment if required;
- Make sure that all injuries are reported and documented;
- Transport victim(s) to nearest appropriate medical support area (whether on-site or offsite); and
- Determine when the emergency is under control and notify the Emergency Coordinator that the emergency is over.

12.7.10 Power Outages

Power and/or other utility failures are not uncommon in mining settings, and typically do not result in emergency situations. The key to prevent power and/or utility outages from becoming an emergency situation is to perform process hazard analyses on all critical process areas and identify utility-critical areas/operations.

According to Standard of Practice 4.1, item 10, of the Cyanide Code, operations should have emergency generators to power pumps and other equipment, as necessary to prevent unintentional releases and exposures in the event its primary source of power is interrupted. Alternatively, stand-by power may not be necessary if power outages do not lead to cyanide-related releases, both water and airborne. For example, if sufficient draindown time has been incorporated into the water balance to allow acquisition, installation, and activation of such equipment.

There are stand-by power generators available at the Yaoure Project site. However, their only purpose is to make start-up easier when the main power is restored. This implies that by process design power outages will not lead to critical situations in terms of air or water borne releases of cyanide.

12.7.11 Natural Disasters

In the event of a natural disaster such as severe weather and floods, the Emergency Coordinator should assess the situation and determine whether mining operations should shut down. Depending on the severity of the event, the Emergency Coordinator should ensure that the following processes/systems are monitored for failure or release caused by the natural disaster: Cyanide Leaching, Pit Slope, and Waste Rock Dump. The procedures outlined in the previous sections should be followed in this instance. Mine shutdown may be followed by evacuation and close co-ordination will be required with the community emergency plan respondents.

12.8 Cyanide-Specific Remediation Guidance

The following is a summary of the Implementation Guidance for Standard of Practice 7.5 of Principle 7 of the Cyanide Code. It provides initial guidance but does not replace a detailed and case-by-case analysis of response options in case of uncontrolled cyanide release.

The two major chemical treatment methods used to remediate cyanide in the environment are:

- Oxidation (using chemicals such as sodium hypochlorite (NaClO) and hydrogen peroxide (H_2O_2) or biological treatment); and

- Complexation (using ferrous sulfate ($FeSO_4$).

Although both methods can be effective in reducing the impacts of cyanide released onto the land, it must be recognised that there are no safe and effective options to treat cyanide once it has entered natural surface waters such as streams and lakes.

Sodium hypochlorite and $FeSO_4$ must never be used to treat cyanide that has been released into natural surface water bodies. Both of these chemicals are toxic to aquatic life. Treatment with NaOCl can produce cyanogen chloride (ClCN), which is hazardous to humans and aquatic life. Moreover, these chemicals have very limited effectiveness in treating cyanide at the pH of natural surface waters. Their utility is further reduced by the practical difficulty of adding them to surface water in a manner that allows for adequate contact and mixing with a cyanide plume, especially in a flowing stream or river. Although H_2O_2 is a less toxic and persistent oxidant than NaOCl, it is also harmful to aquatic life and its effectiveness is similarly limited by the lack of a means to mix it with the cyanide.

However, use of these chemicals may be appropriate in a sufficiently well defined and controlled situation where three conditions are met:

1. There must be a method to introduce the chemical into the water that ensures adequate mixing with a cyanide plume.

2. Effective treatment of the cyanide must be demonstrated at the pH of the surface water.

3. The inevitable adverse impacts to aquatic life must have been considered and determined to be necessary in order to prevent human mortality. This implies that the technique has been fully evaluated prior to its use rather than done as an ad hoc response to an emergency.

Both NaOCl and $FeSO_4$ can be used to treat releases of cyanide to land. Ferrous sulfate binds cyanide in an insoluble complex but does not chemically convert it to a less toxic substance. The complex formed is susceptible to photo-decomposition and can release cyanide back to the environment if it is not properly managed. Application of hypochlorite to neutralize a cyanide spill on land will oxidize the cyanide to the less toxic cyanate (OCN^-), which breaks down to ammonia (NH_3) and carbon dioxide (CO_2)

Hypochlorite and $FeSO_4$ both must be used carefully to avoid their introduction into aquatic systems, and soil contaminated with these chemicals should be excavated and disposed of in compliance with the Code and applicable requirements (i.e., with mill tailings or on a leach pad).

Biological treatment of contaminated soil is also possible but is much slower than chemical treatment.

With respect to environmental monitoring in case of emergency involving cyanide, the following provisions apply:

- Environmental monitoring will be carried out on a regular basis in the hydrographic network upstream and downstream of the mining and waste management installations. This is detailed in the Water Management Plan;
- During cyanide related emergencies, the sampling frequency of the downstream water sampling points will be increased to 6 hours (4 times a day) until emergency response and mitigation measures are complete and no increased cyanide concentrations are measurable; and
- If soil is impacted by a cyanide spill, soil samples will be taken and analysed immediately after the emergency is called, and after remedial work is completed. Should the remediation works not have achieved the targets, additional cleanup works have to be carried out and the soil clearance measurements have to be repeated until the targets are reached.

12.9 Evacuation Procedures

12.9.1 General Provisions

In the event of an emergency, the Emergency Coordinator will typically initiate facility evacuations, including making the determination if a local area evacuation within the Project, a Project-wide evacuation, or evacuation of off-site populations is necessary according to SOP “Evacuations”. Evacuations may include:

- Building evacuations as in the case of a fire in a single building;
- Local area evacuations as in the case of HAZMAT spill in an areas of the plant; and
- Project-wide evacuations as in the case of a major incident.

Building evacuations may be announced verbally or with building alarms. Local area evacuations may be announced verbally or with building/area alarms. Facility-wide evacuations will be announced by sounding of the Project-wide alarm..

Each area supervisor is responsible for directing employees and visitors in her/his section to the proper exit and to a designated safe evacuation muster point outside of the buildings or off the site property.

12.9.2 Personnel Accounting

All personnel from the evacuated area must be accounted for before the “all-clear” can be given and employees can return to their place of work. Therefore, it is important that everyone co-operate fully with those persons taking attendance at the assembly point. Attendance after an evacuation will be taken by visual recognition at the assembly point. No one shall leave the assembly point until accounted for. Security personnel and supervisors are responsible for taking the headcount.

12.9.3 Returning to Work

After the initial assembly and headcount, the Emergency Coordinator must assess the evacuated area to ensure that it is safe to return. The Emergency Coordinator will notify employees if and when it is safe to re-enter the evacuated area. Employees are not to re-enter Project areas or facilities without approval from the Emergency Coordinator.

13.0 EMERGENCY AND MEDIA COMMUNICATION PROCEDURES

13.1 General Provisions

A strategy for handling media contacts during an emergency is a necessary and very important part of the response plan and should be developed at the same time as that plan. As noted, the media has an important role as it is a channel of communication that can reach affected people and response providers quickly. It also plays a vital role in providing information on an event and what is happening on the ground. Key personnel of Perseus will undergo media training.

Perseus will prepare regular media releases, that provides details of the emergency as well as background information and details on the operation and the emergency response plan.

Perseus will conduct a media briefing session t during an emergency if required.

13.2 In Case of an Emergency

All incoming inquiries and responses should be documented. Telephone inquiries should be logged on telephone call log sheets. Media briefings should be transcribed and recorded.

13.3 Responsibilities

As shown in Figure 10-1 of this Plan, the General Manager is responsible for the communication with the community. Timing and information provided to the community and mass media must be approved by the General Manager.

14.0 POST-EMERGENCY RECOVERY

Typically, the Emergency Coordinator will remain in control until the emergency is determined to be over, i.e. medical response to all injured persons is complete, fires are out, spills are stopped and contained, any other situation prompting the emergency is under full control, and the chance of a recurring emergency is deemed minimal. It is the Emergency Coordinator that shall make the determination when the emergency is over and the “All-Clear” can be issued. Control of the emergency at this point will be turned back over to the Emergency Coordinator.

If the emergency situation required that facility processes or regular operations were interrupted or shutdown, the start-up and return to normal operations will be in accordance with the pre-determined start-up procedures. The “All-Clear” alarm announcement does not signal the start-up of interrupted or shutdown processes. Employees will only initiate the start-up procedures when given instructions to do so by their supervisors.

15.0 POST-EMERGENCY MITIGATION

15.1 General Provisions for Post-emergency Cleanup and Recovery

Once the emergency has been declared to be over by the Emergency Coordinator, he/she will be responsible for control of the post emergency actions. While every situation will be different, typical post emergency actions will include the following:

- Documentation of the incident;
- Initiation of the emergency incident investigation, reporting, and record keeping;
- Immediately provide for treating, storing or disposing of recovered waste, contaminated soil or surface water, or any other material that results from the incident;
- Follow-up communication with outside emergency response personnel including notification to any outside agencies or emergency response personnel which were notified during the emergency that operations are about to resume; and
- Ensure that all emergency equipment is cleaned or replaced, and is fit for use before operations are resumed.

15.2 Detailed Cleanup and Remediation Plans

Detailed cleanup and remediation plans can only be prepared after an accident has occurred. Apart from minimizing the environmental and social impacts of the accident itself, the objective would be to enable the facility to return rapidly to safe production, with cleanup to standards acceptable to regulatory authorities, to the community and to the company itself, consistent with good corporate citizenship.

The detailed cleanup-plan will address the following at a minimum:

- Those immediate actions that must be taken before normal operations can be restored and operations/processes that were interrupted or shutdown can be brought back to normal operation;
- Those longer-term actions that must be taken to restore the facility to the condition prior to the emergency;
- A personal protective equipment assessment of all non-routine clean-up tasks to determine appropriate personal protective equipment to be worn during the cleanup activities;
- Additional training for personnel to handle new, non-routine tasks;
- Industrial hygiene monitoring;
- Environmental sampling;
- Waste generation, classification, handling, and disposal;
- Clean-up equipment required;
- Outside contractors or equipment that may be required;
- Decontamination of buildings and process equipment;
- Decontamination, replacement, and stocking of emergency response equipment used during the emergency; and
- Work plan (including schedule) for cleanup and restoration.

In the event of an emergency situation involving hazardous materials, employees involved in the incident, emergency response personnel, emergency response equipment, buildings, process equipment, secondary containment system, and floors all may come in contact with hazardous materials. Employees, emergency response personnel, and equipment must be decontaminated of all chemicals and dusts prior to returning to normal operations.

15.3 Post-Emergency Decontamination

15.3.1 Employee Decontamination

During an emergency, any employee whose clothing or person comes into direct contact with a hazardous substance that is potentially acutely harmful through skin and eye contact or through inhalation, should immediately be decontaminated by:

- Remove contaminated clothing;
- Proceed to a safe emergency shower and eye wash which is away from any chemical or physical hazards;
- Flush the affected areas for a minimum of fifteen minutes;
- Receive first aid care on-site; and
- Be taken to a secondary medical facility for a follow up physical or treatment.

15.3.2 Emergency Response Personnel Decontamination

Employees involved in the emergency response or clean-up activities must remove all contaminated clothing, shower and don clean clothing before leaving the facility property. Likely scenarios involving small amounts of hazardous materials will not require special showering or decontamination facilities. Contaminated clothing should be disposed of as hazardous waste or laundered for re-use.

If an employee is overcome by hazardous materials and becomes unconscious, other emergency response members must decontaminate the unconscious person before he/she is released for transport to a first aid or medical facility. Obviously, in a life-threatening situation, this decontamination may be cursory. The decontamination must be sufficient to prevent possible danger to medical personnel. Medical facilities are not typically equipped to decontaminate clothing or persons contaminated with hazardous materials. Furthermore, the paramedics or medical team must be informed of the hazardous materials involved and should be given Material Safety Data Sheets for those materials.

Under certain emergency situations, such as a contaminated employee who becomes unconscious, it may be necessary to conduct speedy decontamination using the shower facilities. If the shower water is not believed to meet sanitary sewer discharge standards, it will be prevented from release into the environment, collected and disposed of in accordance with all applicable local regulations (the shower drain water will be collected in sewage tanks for treatment before discharge, which allows some buffer capacity for contaminated water).

15.3.3 Equipment Decontamination

As part of the clean-up effort, the Emergency Coordinator will ensure that all emergency response, mobile equipment and/or processing equipment involved in the emergency response or clean-up activities will be cleaned and any necessary service performed before re-use or storage. This is essential, as the emergency response equipment must be in a ready condition before placing back into storage and processing equipment be decontaminated before being placed back into normal operation.

The cleaning will typically consist of a rinse down of the equipment with a mildly alkaline solution. However, Material Safety Data Sheets should be consulted to provide guidance on proper decontamination. The equipment will be scrubbed as necessary to remove any solids. The Emergency Coordinator and the clean-up plan must ensure that the resulting washing liquids are handled and disposed properly. Care should be taken to perform decontamination within permanent or temporary Secondary Containment Systems to prevent further soil and/or surface water contamination.

16.0 EMERGENCY INCIDENT INVESTIGATION AND DOCUMENTATION

16.1 Emergency Response Log Sheet

During any emergency incident, documentation of the emergency begins with the initial report of the emergency by the first responder. Key personnel keeping a log of the incident include the Security personnel taking the call, the Emergency Coordinator who immediately begins a log of the incident at the scene of the emergency response (Emergency Response Log Sheet).

All of these documents, as well as others generated throughout the emergency, become part of the emergency record. In addition, emergencies must be investigated and documented.

The recorded data will be used as input for the post emergency report and analyses of the effectiveness of the emergency response procedures. Corrective and preventive actions must be taken to ensure that such emergencies can be prevented in the future.

16.2 Post-Emergency Response Report

Within 24 hours after the emergency is declared over by the Emergency Coordinator, the incident investigation process begins, under the direction of the Emergency Coordinator, with the purpose of:

- Determining the root cause of the emergency;
- Determining if appropriate emergency response was taken;
- Determining if the Spill Prevention and Response Plan, emergency response organisation, and emergency procedures were adequate or need to be modified;
- Determining corrective and preventative actions to prevent recurrence; and
- Documenting the incident and subsequent corrective/preventive actions.

These findings will be reported in a Post-Emergency Response Report.

As soon as possible but no later than within one day of the emergency response, the Emergency Coordinator together with the involved parties (both internal and external) will evaluate the effectiveness of the response, discuss lessons learned and identify and plan corrective action if required.

During the next weekly safety meeting lessons learned and action status will be addressed.

17.0 EMERGENCY RESPONSE EQUIPMENT

17.1 Fire Fighting Equipment

17.1.1 Portable Fire Extinguishers

Portable fire extinguishers are located throughout individual buildings, storage area, and processing areas of the Project. The number and location of all the fire extinguishers will be identified on the evacuation route maps posted at each building exit and occupied area of the facility.

17.1.2 Fire Hydrants/Containers of Water

Fire hydrants or tanks of water only for firefighting use will be located at strategic points throughout the Project site. These fire hydrants/containers are to be used only by trained fire workers. A location of all fire hydrants/containers will be included in the detailed mine and plant design and taken into account in the next update of this Plan.

Near the fire hydrants, water hoses, blankets, sand boxes are placed.

17.2 Emergency Response Equipment

Emergency Response equipment lockers will be placed strategically throughout the processing plant and other critical locations, near the Emergency Response Team Muster Points. The locker locations will be included in the detailed mine and plant design and taken into account in the next update of this Plan.

Table 17-1 Emergency Response Equipment locker inventory

Emergency Response Equipment	Inventory (minimum)
Rubber gloves	6 pairs
A-level entry suit	4
B-level entry suit	6
C-level entry suit	6
Self-contained breathing apparatus with bottle and mask	6
Emergency Responder Orange Vest	6
Waste collection drums (beside lockers)	5
Absorbent pads	1 roll
Push broom	2
Scoop shovel	2
Square shovel	2
Bullhorn	1
First Aid Kit	1

Portable Eyewash Station	1
Torch with spare batteries	4
Rubber pullover boots	6 pairs
Barrier warning tape	4 x 20 m rolls
Plastic sheets/tarpaulin	2
Portable pump	1
Emergency cones	6
Stretchers	2

Instructions, Material Safety Data Sheets are also available at the Emergency Response Team Muster Points.

Mobile phones and 2-way radio are available at the Command Centre in the Operation Camp.

17.3 Mobile Equipment that can be used in Emergency Response

In the event of a major emergency that requires major earthwork for contamination containment and cleanup works, such as a TSF failure, Perseus has vehicles available that could be used for emergency response. The following list reflects the typical inventory of a mining operation, but may vary significantly over the life of the Project:

- Large haul trucks;
- Dozers;
- Backhoe excavator;
- Motor graders;
- Welding truck;
- Water trucks;
- Pickups;
- Forklifts; and
- Loader.

17.4 Emergency Lighting

Emergency lighting equipment and supporting portable generators are maintained in the Operation Camp.

18.0 EMERGENCY PREPAREDNESS INSPECTIONS

18.1 Inspections of Emergency Response Equipment

A key component of emergency preparedness is frequent, routine inspections of emergency response systems. Inspections of the emergency response equipment within the facility shall be conducted by the Health & Safety Department. These inspections shall be documented. A listing of the emergency response equipment inspections and frequency is shown in Table 18-1.

Table 18-1 Emergency Response Equipment Inspections

Emergency Response Equipment	Routine Inspection*	Detailed Inspection**
Portable fire extinguisher	monthly	annually
Fire hydrants/Containers	n.a.	annually
Fire truck	monthly	annually
Emergency Response equipment	monthly	annually
Emergency Response equipment lockers	monthly	annually
Ambulance	weekly	annually
Emergency lighting	monthly	annually

* Routine inspections are to verify equipment is in place and apparent working order.

** Detailed inspections are a thorough check by qualified persons of the equipment integrity and capability.

These tests will be properly documented and the test records will be kept on file according to Perseus’s document handling procedures.

18.2 Inspections of Alarm and Communication Systems

18.2.1 Testing of Alarms

Internal

Alarms systems within the facility shall be periodically tested by the Health and Safety Department. These tests will be documented and will include:

- Regular actual sounding of the plant-wide alarm system; and
- Annual testing and sounding of all building and area alarms.

External

As per the requirements of any community emergency plan, the designated community alarm system should be tested annually with a co-operative effort between the Perseus facility and the local Town Chiefs, Sous-préfet of Bouaflé and Police (where available). The Emergency Coordinator will participate in this testing. These tests will be documented.

18.2.2 Testing of Communications Systems

Internal

Communication systems within the facility shall be periodically tested by the Health and Safety Department. These tests will be documented and will include:

- Test dialing the Security Number shown in Table 19-1 (phone notification system) on a monthly basis;
- Testing the 2-way radio link to Security on the Channel indicated in Table 19-1;
- Testing the call with two-way radio to contact Security on the channel shown in Table 19-1; and
- Having a test notification call-out of the Emergency Coordinator on a monthly basis.

External

As per the requirements of any community emergency plan, the community communication system should be tested annually by the Sous-préfet of Bouaflé and Police.

18.3 Bulk Storage Tank Inspections

All bulk storage tanks containing fuels, reagents, chemicals, and other hazardous materials shall be formally inspected by the manager (“owner”) of the respective process area to which the stored material belongs. This inspection shall be documented. This shall be a visual inspection of:

- Tank integrity;
- Signs of leaks, bulges, rusting, or other indications of chronic failure;
- Condition of the Secondary Containment System;
- Condition of the piping/pumping systems; and
- Condition of the bermed loading/unloading pad.

18.4 Packaged Product Storage Inspections

All reagent/chemical storage areas (not covered by the tank inspections above) shall be formally inspected by the manager (“owner”) of the respective process area to which the stored material belongs. This inspection shall be documented and shall examine the following:

- Container integrity;

- Signs of leaks, bulges, rusting, or other indications of chronic failure;
- Condition of the bermed containment and any associated sumps;
- Sodium cyanide storage and handling area;
- Condition of the piping/pumping systems; and
- Condition of the loading/unloading pad.

18.5 Explosives Storage Magazine Inspections

The explosive storage magazines shall be formally inspected by a security officer on a monthly basis. This inspection shall be documented and shall specifically examine:

- Magazine integrity, security, and housekeeping, including evidence of rodents or other vermin;
- Proper separation of primer materials from explosives;
- Condition of locks;
- Currency and accuracy of magazine inventory and contents logs;
- Evidence of any potential tampering with magazine doors, ventilators, locks, or security systems; and
- Intactness of lightning protection/grounding.

19.0 IMPORTANT TELEPHONE CONTACTS

Table 19-1 and Table 19-2 contain the contact details of all relevant organisations and individuals, both internal and external. All employees of Perseus and Perseus contractors shall have rapid access to medical services in an accident, e.g., by plaques with contact telephone numbers at their workplaces and at critical points in the mine, process plant, and TSF.

Table 19-1 Important contact details, Perseus Mining

Name, Function	Contact details
General Manager - NN	TBD when mine is operational
SHEC Manager - NN	See above
H&S Manager - NN	See above
Security, Perseus Operations - NN	See above
Doctor / Medical Team Leader - NN	See above
Environmental Management/SHEC - NN	See above
Community Liaison Manager – NN	See above
HAZMAT Team Leader – NN	See above
Fire Fighting Team Leader - NN	See above
Perseus Abidjan Head Office, Country Manager - NN	See above
Perseus CEO – NN	See above

Table 19-2 Important contact details, external

Organisation, individual	Contact details
Medevac – NN	TBD when mine is operational
ANDE - NN	TBD when mine is operational
CIAPOL - NN	TBD when mine is operational
CIPOMAR - NN	TBD when mine is operational
Chief Doctor of the Angovia health centre – NN	TBD when mine is operational
Other clinics, health centers, hospitals (Bouaflé, Yamoussoukro)	TBD when mine is operational
Angovia Town Chief – NN	TBD when mine is operational
Sous-préfet of Bouaflé	TBD when mine is operational

20.0 TRAINING AND DRILLS

20.1 Site Induction

Every new person on site, i.e., Perseus staff, contractor staff and visitors will be informed about the relevant emergency response issues such as:

- How to raise alarm and sound alarms;
- Location of emergency equipment;
- Mustering; and
- Safeguarding and leaving the work area.

The site induction will be the first activity for all people entering the site. Apart from the information above, it will also include other relevant information about the site. Site induction records shall be kept and signed by the attendees.

20.2 Training

Training events will be held every 6 months for the Emergency Coordinator and his/her alternates, members of Emergency Response Teams and other Perseus staff with specific roles in Emergency Response.

Training attendees will have to pass a test at the end of the training. Training contents, date, attendance and test results will be recorded and the records stored for future reference.

The general training will include such issues as:

- Roles and responsibilities of responders;
- How to use the resources available for a mining or metals-related emergency;

- Procedures for contacting relevant people for information or assistance;
- Emergency cards and response guides – how they are structured and how to use them;
- Location, content and interpretation of documents relating to the contents of a spill; and
- Contact with the media and with other key audiences.

Staff assigned to specific emergency response tasks such as Emergency Response Co-ordinator or the Emergency Response Team Leader, fire fighting, first aid and rescue will receive specific classroom and practical training including how to respond to the various emergency scenarios, specific incidents and the use of equipment.

During the training it will not only be assessed if the person selected has the necessary competences, but also if he/she is mentally/physically suitable for the intended task.

20.3 Emergency Response Drills

Emergency response drills will be carried out without notice, but at least every 6 months. Drills will deal with the following issues:

- Sound alarm and mustering;
- Response to Fire/Explosion;
- Rescue and evacuation of injured;
- First aid; and
- “Do’s” and “don’ts” in case of a spill or uncontrolled emission.

Response times, major errors in the response and other relevant issues will be recorded and assessed with the participants after the drill. The drill program will be updated and modified according to the results.

21.0 AVAILABILITY AND UPDATING OF THE PLAN AND RELATED DOCUMENTS

21.1 Location of Documents

The Emergency Preparedness and Response Plan shall be readily available to all parties of an emergency response, both Perseus personnel and external parties.

This Plan is available at the following locations

- On the Project site in the offices of the CEO, Country Manager, Operations Manager/General Manager, H&S Manager, and the SHEC Manager ;

- At the local branch of ANDE;
- Fire fighting team; and

A hardcopy of all applicable Material Safety Data Sheets will be maintained at the SHEC Department office in the Operation Camp.

21.2 Updates

The internal emergency plan will be regularly reviewed by senior management. A review and update will take place every 3 years or more often under the following circumstances:

- An incident covered by this Plan has occurred;
- The Operation Manual has been changed;
- Physical or chemical parameters of the tailings (e.g., cyanide content) have significantly changed;
- Training and drills have revealed insufficient suitability of provisions in this Plan;
- New technical knowledge on failure mechanisms and/or mitigation measures becomes available; and
- Legislation or international best practice related to provisions in this Plan has changed.

Most importantly, after each drill and actual emergency response, the effectiveness of this Plan will be evaluated and as a result the lessons learned are communicated within the organization and corrective actions such as amended scope and frequency of training and routines/procedures, are planned and implemented.

The review process will be documented in the Revision Record (see page 3 of this Plan).

All key environmental and emergency response documents will be reviewed, approved, distributed, updated and located in accordance with the Document Management Procedures of Perseus.

21.3 Responsibility for Updates

The General Manager is responsible for ensuring that the review and updates are executed as planned and informs the all departmental managers accordingly.

The General Manager is responsible for the administrative aspects such as amendment and distribution of documents.

Any changes of this Plan must be approved by the CEO of Perseus or a nominated deputy.