

INITIAL ISSUE DATE	SEPT 19, 2011
REVISION DATE:	Jan 2021
REVISION NO.	8
NEXT REVISION DATE	Jan 2022

9 ENVIRONMENT

INITIAL ISSUE DATE	SEPT 19, 2011
REVISION DATE:	Jan 2021
REVISION NO.	8
NEXT REVISION DATE	Jan 2022

Contents

9	ENVIRONMENT	1
9.1	Environmental Policy	3
9.2	Environmental Guiding Principles	4
9.3	Responsibility	4
9.4	Environmental Practices and Procedures	4
9.5	Environmental Assessments	5
9.6	Waste Management Program.....	5
9.7	Protocol.....	6
9.8	Waste Classification	6
9.9	Waste Minimization.....	8
9.10	Spill Prevention and Management	9
9.11	Working and Operation Of Equipment Near Water Ways.....	11
9.12	Client Communications.....	12
9.13	Safe Work Practices	12
9.14	Training	13

INITIAL ISSUE DATE	SEPT 19, 2011
REVISION DATE:	Jan 2021
REVISION NO.	8
NEXT REVISION DATE	Jan 2022

9.1 Environmental Policy

Terrafirma Resources is committed to a clean, safe and healthy environment, conducting its business in a manner which reflects concern for the environment and supports the principles of sustainable development.

We will strive for continuous improvement in our environmental performance. We will conduct our business in an environmentally sensitive and responsible manner.

Terrafirma Resources is committed to the development and implementation of a waste management and recycling program and to compliance with all environmental laws and regulations. Working together with our subcontractors and employees, these actions will benefit customers, employees and the communities we serve by protecting and improving the quality of the environment in which we live.

We will do the utmost to ensure that all of our employees and subcontractors are properly trained with respect to environmental concerns.

The threat to our environment is real and we now have the opportunity to make a positive impact through leadership shown by this company.

Your cooperation in this endeavour is greatly appreciated.



MANAGEMENT SIGNATURE
NICOLE SAFRON– PRESIDENT

DATE: January 15, 2021
Terrafirma Resources

The safety information in all guidelines does not take precedence over applicable legislations and the OHS Code. All employees are responsible to become familiar with applicable legislations and code.

INITIAL ISSUE DATE	SEPT 19, 2011
REVISION DATE:	Jan 2021
REVISION NO.	8
NEXT REVISION DATE	Jan 2022

9.2 Environmental Guiding Principles

1. All services will conduct hazard identifications and site assessments in an environmentally responsible manner.
2. All employees, management and subcontractors will acknowledge and follow Terrafirma Resources Health, Safety and Environmental Policies and practices.
3. Personnel will ensure that sound environmental management procedures are employed in our operations to protect people, wildlife, air, water, plants and soil.
4. Training and resources will be provided to ensure that company personnel can understand and meet their responsibilities in protecting the environment.
5. Environmental policies and practices will be reviewed and updated on an annual basis or whenever otherwise required by changes in procedure, equipment, legislation, etc., to ensure that they are appropriate and effective.
6. Adverse environmental impacts caused by company operations will be addressed in an efficient and timely manner.
7. Waste generation will be minimized by following the four R's of waste management: Reduce, Reuse, Recycle, and Recover.
8. Terrafirma Resources will promote efficient use of resources in our operations, toward the goal of energy conservation.
9. Terrafirma Resources will recognize, support and encourage technological innovation, research and achievement for improvement of environmental performance.

9.3 Responsibility

Senior Management is responsible for the overall direction and application of environmental management principles and will ensure that these policies, directives and instructions are communicated effectively to all employees and subcontractors. They will also ensure that training and support are provided to all employees and subcontractors as required.

Managers are responsible for coordinating and communicating management direction to all employees in order to support Terrafirma Resources environmental directives. They will also monitor the environmental performance of internal projects undertaken within Terrafirma Resources. This position can be delegated among current personnel as management sees fit.

The Safety Administrator will support Management in implementing an effective environmental policy and program. All employees and subcontractors are responsible for adhering to this policy and maintaining best efforts to implement the principles outlined above in their everyday operations. Subcontractors and employees are also responsible for reporting to management and environmental issues that arise and suggesting possible areas of improvement in environmental performance.

9.4 Environmental Practices and Procedures

This section addresses environmental management strategies for operations within Terrafirma Resources. Environmental concerns will be managed using the following:

- Workplace Hazardous Material Information System (WHMIS)
- Environmental Assessments
- Waste Management Program

INITIAL ISSUE DATE	SEPT 19, 2011
REVISION DATE:	Jan 2021
REVISION NO.	8
NEXT REVISION DATE	Jan 2022

- Waste Classification and Manifesting
- Waste Minimization
- Spill Prevention and Management
- Working near water ways

Workplace Hazardous Materials Information System (WHMIS)

WHMIS is a Canada-wide information system that reinforces a worker’s right to know about the health hazards of controlled products used in the workplace. This system also provides information on protective measures. Controlled products are divided into six hazard classes, some of which are subdivided into divisions.

WHMIS practices are designed to maintain compliance with these regulations and include:

- Labelling Systems
- MSDS, readily available on site
- Training for all employees.

9.5 Environmental Assessments

Internal environmental assessments will support the goals of environmental protection and sustainable development. They are a means to determine the existing environmental concerns at a site or facility. They integrate environmental protection with economic decision-making at the earliest stages of planning an activity.

The purpose of these assessments is to predict the environmental, social, cultural and economic consequences of a proposed activity and to assess plans to mitigate any adverse impacts resulting from such activity.

The detail required for assessments will vary depending on a number of factors including magnitude, frequency, duration, ecological content, reversibility, public concern, etc. Management will specify the degree of environmental assessment required for any activities.

9.6 Waste Management Program

The purpose is to define the processes by which waste is managed on both Company and client work sites.

This practice will be applied to all Company work sites and will be the standard unless a client or regulations require a higher standard. This procedure relates to the production, handling, keeping, safe storage, transport, collection and disposal of all waste generated by Terrafirma Resources, both hazardous and non-hazardous.

Definitions

"Waste" means any solid or liquid material or product or combination of them that is Intended to be treated or disposed of or that is intended to be stored and then treated or disposed of, but does not include recyclables (as per Alberta Waste Control Regulation)

Hazardous waste" means waste that has one or more of the properties described in Schedule 1 but does not include those wastes listed in Schedule 2 (as per Alberta Waste Control Regulation),

"Waste" means an unwanted substance or mixture of substances and includes refuse and garbage. This is interpreted as meaning unwanted by the generator of the waste (as per the Activities Designation Regulation);

"Substance" means any matter that is capable of becoming dispersed in the environment, or is capable of becoming transformed into matter that is capable of becoming dispersed in the environment (as per the Alberta

INITIAL ISSUE DATE	SEPT 19, 2011
REVISION DATE:	Jan 2021
REVISION NO.	8
NEXT REVISION DATE	Jan 2022

Environmental Protection and Enhancement Act);

"Oilfield waste" is defined as waste that results from the construction, operation, or reclamation of a well site, oil and gas battery, gas plant, compressor station, crude oil terminal, pipeline, gas gathering system, heavy oil site, oil sands site or related facility" (as per the Alberta Waste Control Regulation).

9.7 Protocol

- Terrafirma Resources will estimate the waste that will be generated prior to work being performed so that the need for containers and waste removal, if necessary, can be determined.
- Terrafirma Resources will specify if the same wastes or scrap materials are generated for every project. Similarly, if Terrafirma Resources expects non-routine wastes to be generated during a particular project, it will also specify same
- If Terrafirma Resources is performing work on a client's site, Terrafirma Resources will coordinate with the project site or owner to ensure proper disposal of wastes or scrap materials. For example, Terrafirma Resources will ensure the owner is aware of whether wastes and scrap materials will be taken off site by Terrafirma Resources or will be disposed of on the owner's site.
- Terrafirma Resources will assign a person accountable for disposition of wastes generated at all work sites.
- Terrafirma Resources will also address safe practices related to the immediate storage and handling of waste, scrap, or leftover materials. If PPE or other precautions are necessary to handle waste, these will be identified.
- Terrafirma Resources will ensure that project-related wastes are stored and maintained in an organized fashion to encourage proper disposal and minimize risks to employees. For example, proper waste receptacles must be provided for trash and materials that may be reused or recycled during a project.
- Terrafirma Resources will encourage proper segregation of waste materials to ensure opportunities for reuse or recycling.
- Employees must be instructed on the proper handling, storage, and disposal of wastes. This may include general instruction on disposal of non-hazardous wastes, trash, or scrap materials. If wastes generated are classified as hazardous, employees must be trained to ensure proper disposal.

9.8 Waste Classification

Terrafirma Resources will consider all functions and prepare a listing of all wastes generated for standard company tasks. In addition, guidelines will be provided regarding how to dispose, reuse or recycle the various waste streams.

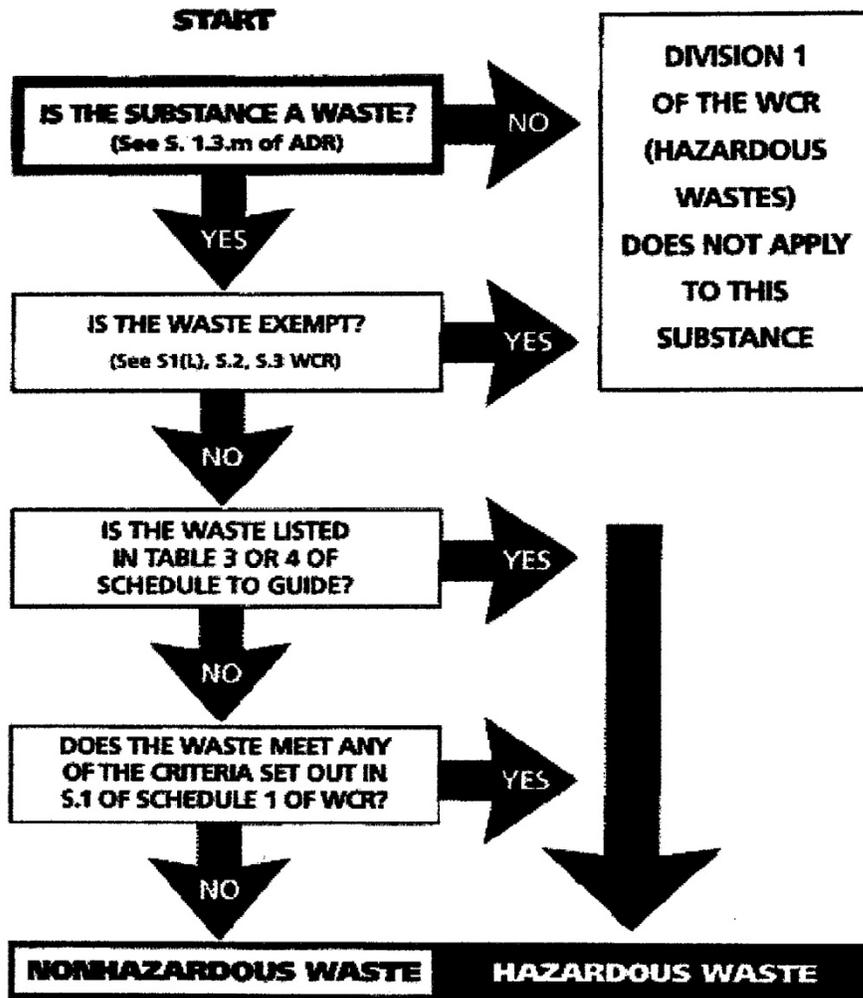
The assigned person responsible for disposition of wastes, to be entitled the Management or the Safety Administrator, will be responsible for performing this task. The list will be reviewed annually to confirm that it is complete and accurate.

At the same time, consideration will be given annually to minimizing or eliminating wastes associated with the various company tasks. Where new equipment or processes are considered, the generation of wastes resulting from their use must be taken into consideration prior to purchase.

The Management or the Safety Administrator will classify the waste, as per applicable legislation and determine the appropriate handling methods for each waste. See Figure 1 below.

INITIAL ISSUE DATE	SEPT 19, 2011
REVISION DATE:	Jan 2021
REVISION NO.	8
NEXT REVISION DATE	Jan 2022

WASTE CLASSIFICATION: FIGURE 1 – STEP 1



INITIAL ISSUE DATE	SEPT 19, 2011
REVISION DATE:	Jan 2021
REVISION NO.	8
NEXT REVISION DATE	Jan 2022

Typical Wastes to be considered:

The following is a list of wastes that may be generated and must be considered when planning and performing work:

- Products whose date for appropriate use has expired
- Material spilled, lost or having undergone other mishap, including any materials, equipment, etc. contaminated as a result of the mishap;
- Materials contaminated or soiled as a result of planned actions (e.g. residues from cleaning operations, packaging materials, containers etc.);
- Unusable parts (e.g., reject batteries, exhausted filters etc.);
- Substances which no longer perform satisfactorily (e.g., , contaminated solvents etc.)
- Residues from pollution abatement processes (e.g., spent filters etc.);
- Machining or finishing residues (e.g., metal shavings from grinding, wood dust/shavings etc.);
- Adulterated materials (e.g., oils contaminated with PCBs etc.);
- Any materials, substances, or products whose use has been banned by law;
- Products for which the holder has no further use (e.g., agricultural, household, office, commercial, and other shop discards etc.);
- Contaminated materials, substances, or products resulting from remedial action with respect to land; and
- Scrap Metal (defective pipe, flanges, etc.)
- Oil or fluid that may leak from machinery
- Any materials, substances or products which are not contained in the above

9.9 Waste Minimization

The purpose of this section is to describe waste minimization philosophies and to promote an active participation in waste minimization by all personnel involved with Terrafirma Resources.

Waste minimization is a continuous improvement practice. It is an ongoing process involving the 4 R’s, and includes the full-cycle assessment of environmental effects and the associated economic and technical feasibility of the various management options.

Terrafirma Resources will promote waste minimization within their operations and will ensure effective management strategies are employed to minimize and effectively handle waste in a diligent manner.

The 4 R’s represent the minimization strategies that may be employed to reduce wastes requiring disposal. Reduction offers Terrafirma Resources the greatest options for waste minimization and can usually be applied at the source. The ultimate way to manage waste is not to produce it in the first place. Reuse can also be applied on-site.

Reduction

Waste reduction involves reducing the amount of waste at its source by modifying operating practices and policies, or changing processes that contribute to waste production. It is usually associated with low capital cost.

Reduction also includes altering input material or end products. Other waste reduction options include:

- Design considerations
- Inventory management
- Improved operations
- Equipment modifications
- Process changes
- Spill and leak elimination
- Optimal raw material use

INITIAL ISSUE DATE	SEPT 19, 2011
REVISION DATE:	Jan 2021
REVISION NO.	8
NEXT REVISION DATE	Jan 2022

Reuse

Reuse is the second Waste Management technique that can be explored. Reuse means reusing a product for its original or a new purpose rather than throwing it away. The longer you reuse a product the longer it is kept out of a landfill.

Significant cost savings can be obtained by installing closed loop systems so that solvents and other materials can be reused in plant processes. The most important thing to remember about reuse is to separate the waste materials to keep them clean. This greatly enhances their ability to be reused or their acceptability as a raw material.

Recycle

Recycling is the third alternative. This involves the reclaiming of a specific product from the waste stream and processing it into new materials and products. Recycling is different than reuse in that it is not the product itself being reused, but the raw materials within a product.

Recycling can be carried out on site or off site. Terrafirma Resources or others can use the waste materials. Just as in reuse, it is important to keep the recyclable material uncontaminated, which minimizes processing requirements.

Recover

The final “R” is recover. Wastes generated by Terrafirma Resources may contain “recoverable substances” that could be recovered and then recycled or reused on site or by others.

Recover also means gaining the useful materials or energy from a product by chemical or thermal means. This is also called “resource recovery”. It includes using a waste material as a fuel, commonly called “refuse derived fuel”. Composting is also a form of resource recovery.

9.10 Spill Prevention and Management

An environmental incident (i.e. spill) is a situation where material is released into the environment (air, soil, water), sanitary sewers or storm water in a manner that is not approved by government authorities or, if unregulated, has the potential to cause an adverse effect on human health or the environment.

Good design and production practices will be followed to ensure that corrosion control and leakage prevention are implemented. Processed chemicals will be stored in secure containers. All spills will be contained, cleaned up and the area will be rehabilitated as soon as possible. Contaminated soils and ground water will be rectified as soon as possible

All environmental incidents are internally reportable. However, not all spills are reported externally. This will vary by substance, the amount released and jurisdiction. This issue will be reviewed in this section.

Alberta has adopted new environmental legislation, the **Alberta Environmental Protection and Enhancement Act. The Waste Control Regulation** addresses the identification, storage, handling and disposal of hazardous waste, minimization and the recycling of hazardous recyclables, and waste control. All wastes generated by the upstream oil and gas industry are regulated by the EUB in Alberta, except integrated facilities and facilities treating both oilfield and non-oilfield wastes. Alberta has a number of defined “waste types” not defined in the federal TDGR.

Spill Procedures

Be prepared to control small spills. SAFETY COMES FIRST. Do not attempt to control a spill unless you are sure it can be done without endangering yourself or others. Call Emergency Services and evacuate the area if there is potential for fire, explosion or other hazard, or if the spill appears likely to migrate offsite. However, if stopping the source of the release can safely contain the spill, do so as quickly as possible. Control of the spill may require:

INITIAL ISSUE DATE	SEPT 19, 2011
REVISION DATE:	Jan 2021
REVISION NO.	8
NEXT REVISION DATE	Jan 2022

- Pick up the spilled container and place it in a safe location while cleaning up the spill.
- If the spill occurs from a drum or tank, attempt to control the source by closing the valve, setting the drum upright or plugging the hole if applicable.
- If the spill occurs from tipped equipment, attempt to right the equipment as quickly as possible.
- Use protective gloves (nitrile) and a face shield, if applicable, while attempting to control a spill.

Once the spill is controlled, contain it, if it is safe to do so, so that the smallest possible area is impacted. It is most important that a spill be contained so that it does not exit Terrafirma Resources or client property. This can be done through absorbent booms and/or granulated absorbent (cellulose).

Terrafirma Resources will place spill response kits near areas where potential spills are likely, but outside the area likely to be impacted by a spill. Terrafirma Resources will regularly inspect the spill kits to ensure the adequate spill response supplies are readily available. The spill response kits will be replaced if the supplies are used.

After eliminating any ignition sources, a spill may be contained by absorbing it or by placing a physical barrier in its path. Usually it is not necessary to physically contact a spilled material or waste product to prevent it from spreading. If the spill is small (less than 20 litres), use granulated absorbent to soak it up and then properly dispose of the absorbent. If the spill is larger, use a combination of granulated absorbent and containment booms, as applicable, to prevent it from spreading.

For any site spill, contact the client site representative and the Terrafirma Resources manager as soon as possible. If the spill is on a public right-of-way and local authorities respond, follow their directions and provide any assistance they request. If the spill is on third-party private property and the property owner wants to direct a cleanup of their site, let them do so and offer any assistance you can.

Reporting Requirements

Terrafirma Resources employees will report all spills to management who, in turn, will report spills to the owner or client and proper regulatory agencies:

- Oil and gas well and facility lease spills of unrefined product or produced water, as well as all off-lease spills, are reportable to the oil and gas regulatory agencies.
- Refined product and chemical spills by Terrafirma Resources employees or subcontractors in well sites, public land, etc. are reportable to the operator and environmental authorities.
- Transportation spills classified under Federal and Provincial TDG Act(s) are reportable to the local, provincial and federal authorities. (Reportable amounts vary by jurisdiction and should be confirmed with local regulatory agencies).

Any amount of a toxic material spilled in a river, lake, waterway, storm sewer or sanitary sewer, or any amount that has the possibility to cause an adverse effect on the environment must be reported in all provinces. **If any doubt exists – report it!** Alberta requires a verbal report of any uncontrolled release of contaminants within 24 hours.

Spills that threaten the environment may require the use of:

- Terrafirma Resources Emergency Response Plan.
- Utilization of the Spill Response Kit

Emergency Spill Response:

- Protect human life
- Contain spill
- Contact supervisor
- Establish further clean-up procedures.

INITIAL ISSUE DATE	SEPT 19, 2011
REVISION DATE:	Jan 2021
REVISION NO.	8
NEXT REVISION DATE	Jan 2022

Secondary Containment

Containers for hazardous waste are to be stored on an impervious slab, with a proper dyke and designed to contain the contents of at least 110% of the volume of the largest container or 25% of the total volume of all containers. Other approved storage devices such as four-barrel spill pallets may be used where appropriate. When these containers are to be stored outside for periods exceeding three (3) months, a shelter or roof must be provided.

Recommended construction for this pad (assuming that the majority of these containers will be metal drums) is:

- A flat surface surrounded by a dyke with entrance and exits allowed by a gently inclining ramp, or
- An inclined pad such that the front of the pad is at ground level with the rear of the pad depressed sufficiently to collect the contents of the volume of the planned capacity of the holding area, or
- A pad surrounded by grated channels capable of holding the volume of the planned capacity.

An indoor hazardous storage area will:

- Provide for separate, designated areas for certain categories of hazardous materials to prevent the accidental mixing of incompatible chemicals.
- Provide for suitable separation distances or a barrier between hazardous chemicals and ignition sources.
- Have forced air ventilation.
- Have adequate lighting and signs.
- Be equipped with suitable emergency equipment.
- Be staffed with employees trained to respond to emergencies related to the hazardous materials stored therein.
- Have a full and complete inventory of all substances posted at locations accessible to fire and Emergency Response personnel, and incorporated into the ERP along with appropriate Emergency Response procedures for given chemicals.

9.11 Working and Operation Of Equipment Near Water Ways

Employees and Subcontractors of Terrafirma Resources will take all means necessary to protect the natural water bodies and their natural habitat. Water bodies include rivers, creeks, lakes, groundwater, swamps, fens, bogs and other wetlands will be protected by the following ways:

1. Not causing sediment-laden wastewater or runoff to enter a water body.
2. Never pumping discharge directly into a water body.
3. Not allowing or causing a toxic material to enter a water body.
4. Never dumping any material or sediment into a water body.
6. Minimizing disturbance of the bed and banks of a water body.
7. Not disturbing the quantity and quality of flow.
8. Not impacting fish and their natural habitats

A couple important Acts that need to be followed when working near water bodies are Fisheries Act and Navigable Waters Protection Act. Fisheries Act is in place to prevent harmful alteration, disruption, or destruction of fish and fish habitat and to prevent pollution by prohibiting the deposit of harmful substances into Canadian waters. Navigable Waters Protection Act is in place to regulate and protect all navigable waterways in Canada.

In the event that Terrafirma Resources must work near water bodies the following steps must be followed:

- Check equipment to ensure it is free of leaks and excess oil or grease. Clean it if necessary.
- Refuel equipment at least 30 m away from the water body.
- Keep spill kits handy.

INITIAL ISSUE DATE	SEPT 19, 2011
REVISION DATE:	Jan 2021
REVISION NO.	8
NEXT REVISION DATE	Jan 2022

- Plan for emergencies.
- Complete the work during favourable weather conditions to avoid erosion and sedimentation.
- Prevent any construction debris and deleterious substance from entering the water body.
- Minimize disturbance to vegetation and soil.
- Replace the soil and vegetation exactly how it was originally.

Terrafirma Resources will not operate mobile equipment within 30 meters of a waterway unless special permission has been granted by the land owner, all required permits are obtained and all applicable Acts and Regulations are followed.

9.12 Client Communications

Where wastes are generated on client sites while performing services for them, all personnel bidding on this work must consider the type and quantity of wastes generated and the disposition of these wastes and include this in the cost and in the description of the work for the client prior to commencement of the work.

Managers will coordinate with the client regarding whether wastes will be removed from site by Terrafirma Resources or left onsite for handling by the client. Particular consideration must be given to waste receptacles that may be required for storage and removal of the waste.

9.13 Safe Work Practices

Management, in conjunction with the HSE Department, will perform a hazard assessment dealing with the handling of wastes and, where applicable, will draft safe work practices to ensure the safe handling, storage and transportation of the wastes.

In addition to the safe work practices, Terrafirma Resources will determine appropriate subcontractors who can provide transport and disposal services for each of the classified wastes and will pre-approve these groups prior to waste generation.

The following includes some of the practices which will be followed when handling waste:

- Items classified as waste will be handled with a duty of care in accordance with legislative requirements
- Waste produced through the routine management of outside areas shall be minimized through the prevention of litter accumulation, and through on—site composting of ground waste, wherever practicable.
- Liquid wastes shall be stored in containers appropriate for the properties of the waste. Such containers will be stored in a suitably dyked area
- Redundant IT equipment shall be appropriately labelled and stored securely pending disposal. The Management or the Safety Administrator, in conjunction with the IT department, will ensure that all
- Company documents are secure and that said IT equipment has been stripped of all Company information.
- Wherever practicable, waste should be compacted before being placed in a storage container for off-site disposal/recycling.
- Similarly, the Management or the Safety Administrator will ensure that all paperwork requiring shredding will receive particular attention.
- All waste will be stored in a safe and secure manner pending collection by third party subcontractors for recovery, recycling or disposal.
- All waste will be stored in a manner that prevents its escape.
- Wherever possible, access to waste containers will be restricted to Terrafirma Resources designated employees, subcontractors and contracted waste collection subcontractors.

INITIAL ISSUE DATE	SEPT 19, 2011
REVISION DATE:	Jan 2021
REVISION NO.	8
NEXT REVISION DATE	Jan 2022

9.14 Training

Terrafirma Resources will ensure that all personnel involved in the handling of waste streams are instructed in the safe work practices and in the legislated requirements for dealing with these various streams. All personnel will be trained on spill prevention and response procedures during their initial orientation in house. Training will be documented and will be performed whenever a new waste stream is generated that requires different handling procedures, or every three years, whichever is less.