DigitalWorld Mapping Inc.

Safety Manual

Manual Introduction

In every section, there will be an introduction just like this one to introduce the section and list what forms can be found to help achieve the main objective. For example, in this Manual Introduction section, you will find information on:

- *Safety Manual Revision Record*

Forms & Reports

This Safety Manual will take you through the processes of Digital World Mapping Inc.'s Safety Management System. From identifying hazards to responding to incidents, these pages will guide you through the ins and outs of a safety program.

Forms and the accompanying paperwork generated makes up for a large part of this Safety Manual. Hazard assessments, inspections, incident reports and many others are the tools used to communicate the safety-related operations of Digital World Mapping Inc.

Forms can be printed and filled out on paper or on your computer (in Microsoft Word). Throughout this Safety Manual there will be screenshots of each form, but the full versions of the forms can be printed from the CD included with this manual or copies can be found at the back of the manual.

Document Control

Document Control becomes an important process in safety operations. Staff members have to know who to give a form to after it's filled out and what happens to it throughout its cycle:

1. Where it starts: a form, such as a Hazard Assessment, Inspection or Safety Meeting, is filled out. Corrective Actions are taken whenever possible.

2. Who to give it to: a Project Manager will review the form and its corrective actions. The Project Manager may suggest additional corrective action and will assign a person responsible and a due date.

3. Where it ends: all documentation will wind up back at the Digital World Mapping office where Managers will also review certain forms and add their input if necessary. Filing the forms in one location becomes the last part in a form's lifecycle.

Safety Manual Revision Record

At least every year, a safety committee made up of representatives from head office (i.e. Managers) and field workers (i.e. Project Managers and Workers) get together to talk about improvements to the safety program. Topics such as incident statistics and general comments to the use of the safety manual are discussed.

The Safety Manual Revision Log tracks any changes that were made as a result of those discussions, according to the date changes were made and the specific changes.

SAFETY MANUAL REVISION RECORD

REVISION #:

SECTION	DATE REVISION	REVISION DESCRIPTION	APPROVED

SAFETY COMMITTEE NAMES:

WORKER: _____

PROJECT MANAGER: _____

MANAGER: _____

OTHER: _____

Commitment & Involvement

Outlining management's dedication to safety in the workplace, Commitment & Involvement details an entire organization's responsibilities and tasks to ensure a safe and incident-free workplace. The forms used in this section are listed below:

- *Health, Safety, and Environment (HSE) Policy*
- *Violence in the Workplace Policy*
- *Working Alone Policy*
- *Petroleum Industry Guiding Principles for Worker Safety*

Remembering to put on your PPE, driving safely, and not smoking near a fuelling station are obvious safety obligations everyone knows about. But going a little deeper in our safety responsibilities gives everyone a greater sense of confidence that the job is being carried out in the safest way possible.

Every staff member has a job title such as President, Surveyor, Geomatics Specialist, Project Manager, Technical Manager and so on. It would get unwieldy if we assigned a different set of safety responsibilities to each and every staff member, so let's just split it into four categories:

1. **Managers:** includes the President, Managing Director, Processing Manager, and Technical Manager
2. **Project Manager:** a designated individual to provide orientation and safety leadership for Digital World Mapping sites and office
3. **Workers:** includes staff whose primary work location is in the field
4. **Contractors:** includes contracted personnel such as airplane or helicopter pilots and staff

Throughout this manual, these are the safety job titles that will be referred to when designating responsibilities. For the most part, the Project Manager will be the go-to person for all safety-related topics.

Now, on to the forms:

Health, Safety and Environment (HSE) Policy

A HSE Policy is a one-page document that details Digital World Mapping's stance on safety, everyone's general responsibilities and the legislation everyone should be familiar with.

The most senior Manager (i.e. the President) must sign, date and post the policy in a central location in the Calgary office.

Project Managers will ensure that all staff members will reflect the guidelines set out in the policy and that Contractors are aware that Digital World Mapping has a specific HSE policy.

Workers will ensure they have read the policy and agree to follow its guidelines.

Violence in the Workplace Policy

This policy is written to document Digital World Mapping's zero-tolerance policy towards any kind of physical, mental and/or verbal assault to any staff member or Contractor.

Although the policy does not have to posted, it does have to be signed and dated by the most senior Manager at Digital World Mapping.

All staff and Contractors are expected to follow the guidelines of this violence policy and as noted in the policy itself, any instances of violence will be dealt with in an extremely serious manner.

Working Alone Policy

In the field, working alone is restricted. Under certain provisions (such as when constant contact is available) can staff members work alone. This policy states that only under these conditions can a worker in the field be alone:

- a competent senior staff member
- when the staff member will be working alone for less than one work day
- if there is a form of communication available (such as a radio or cellphone)
- the staff member has read and understood the Safe Job Procedures for Working Alone
- have appropriate PPE and first aid supplies on hand

This policy does not have to be posted, but must be signed and dated by the most senior Manager at Digital World Mapping.

The Project Manager must ensure staff who are working alone follow the conditions above and in the policy. Additionally, the Project Manager must ensure less experienced staff members do not work alone.

Workers are to review the policy and abide by its contents.

Petroleum Industry Guiding Principles for Worker Safety

This is a policy created by various petroleum associations and states its expectations for Digital World Mapping to meet worker safety standards set out by the petroleum industry.

Along with the HSE Policy, the Guiding Principles must also be signed, dated and posted in a highly visible location in the Calgary office by the most senior Manager at Digital World Mapping.

Health, Safety & Environment Policy

Digital World Mapping is committed to the protection from accidental loss of all its resources, including employees and physical assets.

In fulfilling this commitment to protect both people and property, management will provide and maintain a safe and healthful work environment in accordance with industry standards and in compliance with legislative requirements, and will strive to eliminate any foreseeable hazards which may result in property damage, accidents or personal injury/illness.

All management functions will comply with company safety requirements as they relate to planning, operation and maintenance of equipment.

All employees and contractors will be equally responsible for minimizing accidents on our work sites. Safe work practices and procedures will be clearly defined in the Safety Manual for all employees and contractors to follow. All employees and contractors are responsible for understanding and complying with all Company policies, procedures, rules and applicable legislation.

It is important for all employees and contractors to minimize disturbances to wildlife, plant life and the environment while working on Digital World Mapping work sites.

Accidental loss can be controlled through good management in combination with active employee and contractor involvement.

Safety is the direct responsibility of all management, employees and contractors.

I trust that all of you will join me in a personal commitment to make safety a way of life.

The health, safety and environment information in this policy does not take precedence over Occupational Health and Safety regulations and other laws.

_____

Morgan Steeves, President

_____

Date

Violence in the Workplace Policy

This policy is to ensure all employees are able to work in an environment free of violence. Any act of violence committed by or against any worker or member of the public is unacceptable conduct and will not be tolerated. Disciplinary action up to and including termination will be enforced.

Violence includes but is not limited to: attempted, threatened or actual conduct of a person that causes or is likely to cause physical injury. We are committed to investigating reported incidents of violence in an objective and timely manner, taking necessary action and providing appropriate support for victims.

Confidential Informal Complaint Procedure:

Prompt, appropriate, direct action must be taken to stop incidents of violence. An employee must tell the offending individual that their behaviour is inappropriate; if the employee is reluctant to make the statement he/she shall inform a Manager or Project Manager who shall bring the complaint to the attention of the alleged individual for the purpose of resolving the matter. If the offended individual or alleged offending individual is not satisfied with the resolution of the matter, then a formal written complaint must be filed by one of them.

Confidential Formal Complaint Procedure:

A confidential formal written complaint is to be filed with Management. Only a signed written complaint will be investigated under this formal procedure. The Project Manager or Manager shall then determine the scope of investigation and the proper corrective action.

A formal written complaint shall be a signed account of what occurred, including a description of the incident(s) and the names of all persons present. The formal complaint is to be filed within fourteen (14) days of the incident(s), unless circumstances justify submitting it beyond fourteen (14) days.

Upon completion of the investigation the Project Manager shall forward a copy of the completed investigation report and decision to the appropriate Manager and shall be placed on file.

_____

Morgan Steeves, President

_____

Date

Working Alone Policy

Although it is uncommon for an employee of Digital World Mapping to work alone, whereby he/she is unable to get immediate help in the event of an incident, working alone is an issue we feel is important to address.

The primary prevention strategy is to ensure hazards are identified and managed before the lone worker begins work, thereby decreasing the risk associated with working alone.

Having written Safe Job Procedures (SJP) is essential when dealing with hazardous work. Digital World Mapping provides these SJP's to the employee in their Safety Manual. SJP's provide standard instructions to all employees on how to carry out the work safely.

It is Digital World Mapping's responsibility to ensure the equipment is maintained according to the manufacturers' specifications and the OH&S Code, regardless of whether or not the employee is working alone. A hazard assessment on the site must first be performed if an employee is to work alone.

Appropriate first aid and Personal Protective Equipment will be provided to employees who are working alone at a work site. The Project Manager will be in timely arranged contact with the employee who is working alone. An employee who fails to report on time will signal the Project Manager to put the job specific Emergency Response Plan into action.

_____

Morgan Steeves, President

_____

Date

Hazard Identification & Control

Hazards that are identified have to be reported and then corrected. The documentation and communication of this process to minimize risk and the chance of an incident is the primary role of Hazard Identification and Control. The forms used to identify and communicate hazards are listed below:

- *Hazard Assessment/Office Inspection Form*
- *Vehicle Inspection Form*

Definitions

There are a few terms pertinent to Hazard Identification & Control that need to be defined. These terms will be referred to throughout the sections and forms in this manual:

- HAZARD: any object, physical condition or physical effect that has the potential to cause an accident.
- RISK: in the context of HSE, risk is defined as a measure of the probability (exposure) for an incident to happen and of the potential severity of the consequences (potential).
- NEAR MISS: an undesired event, which under slightly different circumstances had the potential to cause an accident.
- UNSAFE ACT: an unsafe act can be one performed by the reporter or another observed employee, contractor or client. It identifies an action by a person who is in violation of a procedure or protocol.
- UNSAFE CONDITION: the unsafe condition applies to something physical, such as a sub-standard vehicle, tool, etc.

The forms used for Hazard Identification & Control are as follows:

Hazard Assessment

Taking the time to identify and assessing hazards on unfamiliar ground before work begins can effectively communicate any dangers workers may face before beginning work. Hazard Assessments are to be performed by the Project Manager and used at these times:

- When a new job begins
- When there has been an incident
- Weekly site inspection (if project is longer than one week)
- When a job has changed (i.e. new equipment, change in procedures, new location)

Additionally, this form is also used as an Office Inspection (a checkmark box on the form will designate whether it is a Hazard Assessment or an Office Inspection). Office Inspections are to be carried out by either a Manager or designated worker on a quarterly basis to ensure safety is emphasized in the office as it is in the field.

HAZARD ASSESSMENT

PRIORITY #			
1: Hazards ranked 1 are considered to be very hazardous, previous accident or high potential of accident	**2:** Hazards ranked 2 are considered to be hazardous with moderate risks	**3:** Hazards ranked 3 are considered to be hazardous with low risks	**4:** Hazards ranked 4 are considered to be acceptable or not applicable

Job Name:		Assessment Conducted By:
Office Inspection: ☐ Weekly Site Inspection: ☐ Job Change: ☐ Post Incident ☐ New Job: ☐		Position:
Date:		Signature:

Item	Identified Hazards	Priority #	Location and description
1.	Housekeeping		
2.	Material Storage		
3.	Waste Disposal		
4.	Rushing		

Vehicle Inspection Form

Driving is regarded as one of the most dangerous and incident-prone activities in the workplace. That is why vehicle inspections (on vehicles such as cars and trucks) must be conducted on a weekly basis by the driver when in the field and before journeys. Inspections only apply for vehicles that are used for work-related activities on Digital World Mapping sites.

Additionally, it is highly recommended that all staff members perform a visual inspection of their vehicle prior to each use. Visual inspections (which are not documented) can include the following:

- checking tire pressure levels
- first-aid, kit and fire extinguisher
- fluids are topped up
- windows, lights and mirrors
- obstructions around the vehicle
- updated Emergency Response Plan

If there is a hazard found during a visual inspection, a full inspection using the Vehicle Inspection Form will be carried out at that point and then the hazards must be corrected in a timely fashion depending on the severity of the hazard.

DigitalWorld — **VEHICLE INSPECTIONS**

| Job Name/Location: | Date / Time: |
| Inspector: | License or Vehicle Number: |

Hazards	Acceptable (Y/N)	Corrective Action
1. Head / Brake /Tail / Back up		
2. Signal / Hazard Lights		
3. Windows / Mirrors		
4. TDG Placards		
5. Jack & Tire Iron		
6. Spare Tire		
7. Booster Cables		
8. Seat Belts		
9. Tow Hooks and Straps		
10. Flares and Reflectors		

Hazard Alert Form

Even after Hazard Assessments and inspections are performed, hazards can still be present on a site as it is impossible to identify every single hazard. Hazard Alert Forms act as small supplements to a Hazard Assessment on a site. Near misses can also be reported on a Hazard Alert Form since near misses are typically caused by hazards that were not identified.

Some examples of hazards include: slippery/icy ground, missing placards, hazardous substances, weather, lack of training, inadequate PPE, etc.

Some example of near misses include: the falling of a gas container, overexposures to dangerous chemicals (not resulting in illness or injury), and slipping and falling on a wet surface without injury, etc.

All staff members are expected to report all hazards and near misses, and correct the hazard where possible. The Project Manager should review all Hazard Alert Forms, perform or suggest additional corrective actions if necessary and documenting the process in the Corrective Actions Logbook

DigitalWorld — **HAZARD ALERT FORM**

All workers are responsible for reporting all hazards, unsafe acts, conditions and near misses

Job Name:	Reported By:
Hazard Location:	Position:
Date/Time:	Signature:

This form can be filled out anonymously if you so desire.

Hazard Examples:
missing placards, hazardous substances, weather, icy floors, lack of training, lack of / inadequate PPE, etc.
Near Miss Examples:
the falling of a gas container, overexposures to dangerous chemicals (not resulting in illness or injury), and slipping and falling on a wet surface without injury, etc...

| ☐ Hazard | ☐ Near Miss |
| Describe the situation: | |

Rules & Procedures

Certain Rules & Procedures need to be implemented in order to ensure everyone is doing their jobs in the safest manner. Some things are obvious, such as wearing a seatbelt when driving around a site. But there are other considerations too. That is why the following have been written:

- *Safe Job Procedures*
- *Safety Rules*

Rules & Regulations

Besides the rules and procedures Digital World Mapping has implemented, there are also a set of government rules and regulations to follow. The major piece of documentation is called the Occupational Health and Safety (OHS) Act, Regulation and Code. Although each province has different acts, regulations and codes. This safety manual has been written to comply with all the rules and jargon in the Alberta document, but it does not mean this manual replaces it. It is still a vital part to any company's safety program. All Digital World Mapping staff and Contractors are expected to be familiar with the OHS document. Site Supervisors will ensure there is a copy available on site.

Other regulatory bodies Digital World Mapping must comply with includes:

- **Transport Canada** - Canadian Aviation Regulations: Although Digital World Mapping does not directly fly any airborne vehicles, senior Managers and the Project Manager should be familiar with the guidelines set out in this document.
- **The Federal Aviation Administration** - Federal Aviation Regulations (US): When working in the United States, these regulations should be reviewed by senior Managers and/or the Project Manager.
- **Controlled Goods Directorate** - Export Controlled List: Because Digital World Mapping's Lidarus system falls under "strategic goods" as a global navigation system according to Public Works and Services Canada, it must be registered with the Controlled Goods Directorate.
- **Enform:** Acting as the petroleum industry's association for health & safety, Enform (www.enform.ca), has a list of Safe Work Practices and Safe Job Procedures that can be adapted to Digital World Mapping's work processes. Additionally, Digital World Mapping must comply with the following Petroleum Industry Recommended Practices (IRP's): Basic Safety Program (vol.9), Return-To-Work Program (vol. 10) and Basic Safety Awareness Training (vol. 16).

In addition to the above legislation, Digital World Mapping's Rules and Procedures include:

Safe Job Procedures

Safe Job Procedures include specific guidelines on how to perform a task in a safe manner (such as driving or fuelling), its hazards and its recommended minimum PPE.

As Digital World Mapping grows, new Safe Job Procedures may be necessary. Here are some steps to creating Safe Job Procedures (SJP):

- Define the job
- Select individuals to help develop the SJP
- Break the job down to identify standard tasks
- Identify and note any hazards or potential incidents
- Determine means of controlling or eliminating the hazards
- Document the SJP
- Review with all workers
- Execute work
- Upgrade SJP with new knowledge
- File for future reference

Project Managers are to ensure all staff and Contractors are following these practices and procedures at a job level. Additionally, the Project Manager is to create new Safe Job Procedures with Workers and Managers when deemed necessary.

SAFE JOB PROCEDURES

The risk classification process to determine which Safe Job Procedures are to be written is as follows:

Ranking	Scale			
Consequence/Severity	1 = Low	2 = minor	3 = moderate	4 = high
Probability	0 = never	1 = not common	2 = Frequent	
Frequency	1 = >10 workers	2 = 10-20 workers	3 = >20 workers	

Safe Job Procedures will be written for tasks with a Consequence/Severity rating of 3 and higher, and a frequent probability. The set of tasks are listed below. The consequence rating is noted in brackets:

Driving (3)

- Take time to inspect vehicle before starting for flat tires, broken lights, loose tailboards or tool compartment doors open
- Complete Vehicle Inspection Form on a weekly basis
- Do not drive when fatigued, or under the influence of alcohol, narcotics and/or drugs
- Ensure seatbelt be worn at all times by all passengers
- Be familiar with the vehicle
- Only authorized persons shall be permitted to operate company vehicles or equipment
- Park vehicle away from traffic
- Whenever possible, avoid using cellular phones while driving
- Back in when practical
- Minimize night driving and beware of wildlife
- Avoid offering rides to strangers and hitchhikers
- Never drive fatigued. Do not drive long distances after a full day of work. Sleep and travel the next day
- All drivers must have a valid operators' license

Journey Management
- Pre-trip planning is necessary. Reduce the risk through the proper selection and training of people, equipment and routes. For long trips consider availability of services (i.e. gas stations). Plan to travel using the safest and most efficient means of transport, ensuring that sufficient amounts of survival equipment in good condition are available for all passengers
- Check that each vehicle has the necessary safety/emergency equipment
- During the winter months ensure the following emergency supplies: blankets, source of heat (i.e. matches, candles), non-perishable food, shovel and sand/salt
- Carry a radio / cell phone when away from a vehicle
- Discuss with supervisor to ensure that a contact is available at both ends of the trip, and that the communications numbers have been tested prior to departure
- Ensure that personnel at both ends of the trip are aware of the travel plans (i.e. method, schedule, and route)
- Agree on a check-in schedule for the duration of the trip with supervisor
- Ensure that all parties are aware of the proper contacts to make in case you miss your check-in time by more than the agreed amount of time. This amount of time will vary according to the hazards (i.e. cold, wildlife) the trip or the work location
- Report hazards to contacts in case others are traveling the same route
- Check the weather forecasts all along the route and delay departure until acceptable conditions are reasonably assured
- Ensure that all passengers are aware of their responsibility to look for hazards
- In case of incident, do not abandon the vehicle unless it is on fire or has to possibility of catching on fire
- Allow adequate time for the journey

- Abide by Provincial Highway Acts and Regulations at all times

- Drive according to road conditions and weather. Use extra caution when conditions are poor

- Complete vehicle inspection on a weekly basis and before a journey

Safety Equipment Recommendations: First aid kit, warning flares/triangles, tire chains, tow straps, flashlight, batteries and a means of communication; Winter: Emergency blanket, source of heat (i.e. matches, candles), non-perishable food, shovel, sand/salt, TDG Placards (when needed), 1 ABC Fire Extinguisher

Hazards and Potential Incidents:
- Vehicle malfunction
- Road hazards
- Accidents
- Collisions
- Rollovers
- Environmental hazards
- Worker Distraction
- Fatigue
- Complacency
- Rushing
- Wildlife

Fuelling (3)

- Choose firm ground that is not susceptible to flooding

- Avoid oil and fuel spills. Fuel leaks, of any amount, are unacceptable and must be contained and fixed immediately. Depending on the province you may have to write a report

- Re-fuelling is prohibited until all leaks are fixed and any spill cleaned up

- Use a fuelling spout. Store fuel nozzles off the ground with the nozzle facing downward to preclude water contamination

- Suspend fuelling operations immediately when a lightning discharge hazard exists

- Fire extinguishers must be strategically located, prominently displayed and readily available at all fuelling locations

- "No Smoking" signs must be strategically located and prominently displayed near the fuelling locations

- When re-fuelling vehicles, the ignition must be shut off

- There must be no smoking and no other source of ignition within 7.5 meters of the fuelling area

- Absorbent material must be placed under all valves and hose couplers

- All fuel dispensing systems must have grounded metal containers to catch spillage

- Fuel storage areas must be a minimum of 100 meters from living accommodations

- Always wear gloves when fuelling

- Mobile phones should not be used when fuelling

- Do not re-enter your vehicle when fuelling

- Employees engaged in fuel handling in dusty conditions or where there is fuel vapors shall wear applicable respiratory protection

- Always fuel in a cleared, debris free area

- Make sure the filler caps are snug; check for leaks. Replace or repair caps that have damaged vents

- Pilots and their staff are to fuel their aircraft, <u>never</u> by DWM staff

PPE Requirements: Gloves, respirator (as needed), eye protection (as needed)

Hazards and Potential Incidents:
- Fire, explosions
- Spills, releases
- Ingestion
- Illness

Heavy Lifting (3)

- Always keep any strain on your back to a minimum and keep knees bent when lifting
- Support your elbows on your knees when working in a crouched or bent position
- Always keep your back straight and as upright as possible when lifting to ensure even distribution of the load
- Always use both hands when lifting so that your back is loaded evenly on both sides
- Never pick up or put down an object while in a twisted position
- Never place yourself under a heavy object when it is being lifted
- Never over-reach or bend too far to the side
- Take advantage of skids, hoist, bars, jacks, blocking or rollers when moving heavy material
- If the object is unduly heavy, get help!
- To avoid placing the load on one person, pick up or lay down the object on a given signal

PPE Requirements: Gloves (as needed)

Hazards and Potential Incidents:
- Strains and injuries
- Slips, trips and falls

Helicopter Transportation (4)

Boarding a Helicopter

1. Approach or leave the machine in a crouching manner (for extra clearance from main rotor)
2. Approach or leave on the downslope side (to avoid main rotor)
3. Approach or leave in pilot's field of vision (to avoid tail rotor)
4. Carry tools horizontally, below waist level (never upright or over shoulder)
5. Hold onto hard hat when approaching or leaving machine, unless chin straps are used
6. Fasten seat belt and shoulder harness (if installed) on entering helicopter and leave fastened until pilot signals you to release it and get out
7. If leaving machine at the hover, get out and off in one smooth, unhurried motion
8. Do not touch bubble or any of the moving parts (tail rotor linkage, etc.)

General Helicopter Safe Job Procedures

- Keep helispot clear of loose articles (bags, equipment, etc.)
- A helicopter landing on snow may sink and have less clearance under the rotors. Exercise additional caution and crouch even lower when approaching or leaving a helicopter that has landed on snow
- Never be further to the rear in the helicopter than the cargo door
- Always dress for the weather. Even though the helicopter may be warm inside, always dress for possible emergency situations
- Properly secure loose articles of clothing (e.g. scarves, caps, hard hats, mitts, goggles, etc.) before approaching or leaving the helicopter. Keep a tight grip on loose articles
- Fasten seat belt and keep fastened at all times until the pilot signals the belt may be undone
- Wear appropriate life saving equipment when operating over water
- Do not smoke in or near the helicopter
- Do not slam doors
- Never to open any door (passenger or cargo) unless directed to do so by the pilot or another crewmember
- Never to remove personal gear until instructed to do so

- Use caution when exiting a helicopter, especially if the helipad or surface is metal and slippery or wet

- If a passenger is in a seat equipped with a shoulder harness and a safety belt, the harness should be snug, not slack

PPE Requirements: Eye protection, ear protection, ankle support boots, high visibility safety vest

Hazards and Potential Incidents:
- Helicopter rotors
- Debris
- Dust in eyes
- Noise

Transporting Flammable Substances (4)

- Managers are responsible to facilitate and/or provide proper instruction to their workers regarding Transportation of Dangerous Goods (TDG)

- Workers responsibilities are to ensure documentation is in place, and placards as per TDG regulations (i.e. flammable liquids must be transported and stored in approved containers bearing the CSA, ULC, and WHMIS labels)

- Ensure flammable liquids are not carried in the passenger compartment of a vehicle

- Ensure that the containers are not damaged and that caps or fittings are properly secured after filling

- Ensure containers are in an upright position and are secured to prevent overturning or shifting

PPE Requirements: Gloves and eye protection (if necessary)

Hazards and Potential Incidents:
- Fire, explosions
- Spills
- Releases

Working Alone (4)

- Conduct a Hazard Assessment before work begins

- Read and understand all applicable Safe Job Procedures. They have been developed to help you perform your work as safe as possible. If you are unsure of the procedures, ask your Project Manager to clarify them for you

- Know how to use your equipment well. It must be in good working order and maintained according to manufacturer's specifications

- Contact your Project Manager or another co-worker at established intervals

- If the isolation of a worker(s) is for any extended amount of time, a regularly scheduled radio check-in procedure will be established and monitored

- Only competent personnel will be assigned working-alone type duties

- All workers are to have with them the appropriate clothing and personal protective equipment and are expected to act in a safe manner according to the training given to them by the employer

- Any employee involved in the initial stages of On-the-Job training must remain under direct supervision and will not be allowed to work alone until competency is shown by the worker

- All equipment used in remote locations will be maintained in proper working order and will contain a first aid kit and fire extinguisher(s). This equipment will be checked on a regular basis

- In the event that radio contact with an employee who is working alone is lost, or has exceeded the established check-in time, the prime objective of those parties involved will be to re-establish contact with that worker, ascertain his condition, and resolve the communication failure

Employer Obligations:

- Identify hazards and assess risk associated with the workers job duties. Where possible eliminate the hazard and risk. If not

possible, manage and communicate the hazard to the worker to minimize the potential of an incident

- Ensure employees are adequately trained and competent

- Keep track of where all staff members are at all times

- Equipment must be in good working order and maintained according to regulations and manufacturer's specifications

- Supply employees who work alone with appropriate first aid and emergency supplies and personal protective equipment

- Provide effective means of communication for employees to contact others who are capable of responding when employees need immediate assistance

Hazards and Potential Incidents:
- Slips, trips and falls
- Knee, ankle, leg injuries (i.e. sprain, broken bones, etc.)
- Fire, explosions
- Spills
- Releases

Working in Mountainous Terrain and Broken Ground (3)

- Never overload yourself with equipment

- Always step over logs not on them

- Never cross creeks without proper footwear being worn

- Utilize seismic lines or detours; never take shortcuts

- Never stand directly below an ascending or descending worker as rocks can be dislodged

- Pay full attention to your surroundings and constantly pre plan your actions

- Test all ropes prior to using

- Observe 'flagging' warnings (i.e. cliffs, bee hives, detours, etc.)

- Never follow closely behind workers on a hand cut because of branches springing back

- Always use caution when climbing through barbed wire fence. If possible, have someone part it for you while you climb through it. Never stand on the wires

PPE Requirements: Appropriate outerwear, ankle-supported boots

Hazards and Potential Incidents:
- Slips, trips and falls
- Knee, ankle, leg injuries (i.e. sprain, broken bones, etc.)
- Weather (extreme temperatures)
- Terrain (cliffs, broken ground)
- Dangerous trees

SAFETY RULES

Safety Rules cover major safety issues, such as PPE requirements, violence in the workplace, drug & alcohol, and working alone matters that all staff and Contractors must be familiar with. Safety Rules are to be posted in a highly visible location in the office.

Housekeeping

• Keep your work area clean and free of flammable and dangerous materials

• Watch for hazards such as nails, electrical wires, grease and oil

Safe Driving

• Always wear your seatbelt

• Make sure vehicle is equipped with adequate safety equipment (i.e. first aid kit, fire extinguisher etc.)

• Complete vehicle inspection form on a weekly basis

• Drivers shall, whenever possible, avoid using cellular phones while driving

Smoking and Fire Prevention

• Smoke only in designated areas add at least 7.5 metres from a fuelling area

• Lightly shake fire extinguishers on a monthly basis

Alcohol and Drug Abuse

• The use of alcohol or illegal drugs at work is prohibited

• Notify your supervisor if you are taking prescription drugs that can cause drowsiness and may affect your work

Reporting Hazardous Conditions & Incidents

• All hazards, near misses, unsafe acts/conditions/behaviours and incidents must be identified and reported as soon as reasonably possible. Suggest corrective actions. If possible, manage the hazard ASAP

Personal Protective Equipment (PPE)

• All employees must wear PPE appropriate to their job task and can include any of the following (depending on the situation, client requirements and discretion of the Project Manager):

• eye protection (when needed)	• flame retardant outerwear (site specific)
• ankle-supported boots (mandatory in field)	• gloves (when needed)
• hearing protection (when needed)	• snug fit long-sleeved shirts and long pants (mandatory in field)
• Gas Monitor (site specific)	• high visibility safety vest (mandatory)
• high visibility clothing (mandatory in field)	

• All equipment must meet regulatory and Canadian Standards Association (CSA) standards or Occupational Health and Safety (OH&S) regulations

• PPE must always be cleaned, in good condition, and maintained according to the manufacturer's specifications and CSA standards

• All PPE must fit properly

Enforcement

• Enforcement by management staff should be used to reinforce Digital World Mapping's safety program

• Discipline will be administered to workers who intentionally work unsafely or who repeatedly make safety mistakes

Emergency Response

When an incident arises, the first question to come to mind is, "what do I do?". Preventative measures can reduce the number of incidents, but preparedness can make sure this question is answered immediately.

- *Emergency Response Plan (ERP)*
- *Emergency Procedures*

Emergency Response is really about preparation and effective response in the event of an incident. If an incident such as a fire does arise, everyone will know what to do as it was discussed during a safety meeting or during an orientation. By understanding the procedures if an incident and having all the necessary supplies present, an incident can be contained effectively by staff members who know how to respond to an emergency.

Here are the documentation tools used for Emergency Response

Emergency Response Plan (ERP)

The ERP is the document backbone in the case of any emergency. It lists pertinent phone numbers, general procedures and guidelines directly related to emergencies (i.e. muster area).

The Project Manager is responsible for filling out specific areas of the ERP to keep it updated and distributing copies to all workers on site.

The manager is responsible for keeping the office ERP updated and posted in a high traffic areas in the office.

EMERGENCY RESPONSE PROCEDURES

This set of procedures act as an extension to the ERP and covers topics such as fires, explosions and basic reporting procedures. All Digital World Mapping staff must be aware of the procedures and know its location in this safety manual.

Injury / Illness

- Cease work activity and evacuate to muster area if necessary
- Notify Project Manager as soon as possible
- Keep injured person motionless and begin first aid
- Contact appropriate authorities (see ERP)

Vehicle Accident

- If possible, move yourself and the vehicle away from the road and traffic
- If vehicle cannot be moved away from the road and traffic then secure the area by setting up flares using your flare kit (or triangles) and the instructions included. Activate your hazard lights and lift the hood of the vehicle to make all other motorists more aware that you are there
- Call and/or send for help when necessary
- Assess the area before any other action
- Turn the vehicle off and take keys out of ignition
- Do not put yourself between your vehicle and on-coming traffic. Protect yourself first!
- When necessary attend to casualties and administer first aid

Fire (Building Evacuation)

Do Not Fight Fire If…

- The fire could block your only exit
- The fire is spreading too quickly
- The type or size of the fire extinguisher is wrong
- The fire is too large
- You don't know how to use the fire extinguisher

If fire is controllable:

- Use the appropriate extinguisher
- Remember P.A.S.S.
    - PULL THE PIN
    - AIM THE NOZZLE
    - SQUEEZE THE HANDLE
    - SWEEP SIDE TO SIDE AT BASE OF THE FIRE
- Cool down the fire area with excess water

If fire is not controllable:

- Activate alarm
- Evacuate and report to muster area
- Call 9-1-1
- Notify Manager as soon as possible
- Remain at the muster area until further notified by the Manager. Do not re-enter the structure

Hazardous Materials Spills / Releases

- Incidents involving dangerous goods or spills must be reported to your Project Manager immediately
- Do not touch or walk through spilled material
- Barricade the area and eliminate all ignition sources (i.e.: no smoking, turn off machinery and/or vehicles)
- Evacuate to the muster area and remain there until instructed to do so otherwise by the Project Manager
- For large spills, consider initial evacuation for 800 meters in all directions
- Project Manager must alert the appropriate authorities for further action, when necessary
- Project Manager is to manage the spill according to the appropriate Material Safety Data Sheet for information on cleaning up the spill, first aid measures if a Worker has been in contact with the substance and the best way to put out a fire if it begins to burn
- All equipment used when handling the product must be grounded
- If the spill is large, the area has been deemed unsafe or the clean up instructions are unclear then do not clean up or dispose of chemical substances, except under supervision of a specialist

Chemical on Body

- Wash thoroughly for 15 minutes with water using nearest shower or hand/spray unit. Remove any overlying clothing that may retain the chemical and prevent thorough washing of the skin
- Promptly report the incident to your Project Manager
- Depending on the chemical, additional medical treatment may be required. Consult the MSDS
- If in doubt about further treatment, call the Poison Control Centre at 1-800-332-1414

Chemical in Eye

- Immediately flush eyes with copious amounts of water for at least 15 minutes, removing contact lenses if possible
- Promptly report the incident to your Project Manager
- Seek medical attention immediately. Go to the nearest hospital emergency department
- If possible, obtain the MSDS and provide it to the treating physician

Explosion

- Report explosion to your Project Manager and barricade the area
- Evacuate and remain at the muster point until instructed to do so otherwise by the Project Manager
- Project Manager to consider evacuation of all personnel to clear ½ mile in all directions. Ensure contractors and civilians are included
- The scene of the accident shall be left undisturbed except where it is necessary to protect life or prevent injury or where an authorization to proceed has been given by the appropriate authorities

Helicopter Incident

- The "brace-for-impact" position is used to reduce secondary impact and flailing around
- If contact with the aircraft interior is likely, the passenger should place his/her body against what the passenger will hit before the impact occurs
- If a passenger is resting against the surrounding structure, he/she can "ride the structure down" during the crash, thus avoiding a secondary impact. In addition, this position will reduce the forces acting on the body and can help reduce the severity of injuries
- Emergency Water Landing: Passengers should follow the instructions of the flight crew in the event of a forced landing in water and inflate life vests only when clear of the aircraft
- If forced down, stay with the aircraft unless you know you can reach help before an air search finds you
- Be prepared to attract search aircraft using flares, smoke, signal mirrors or other available means

Communications

Throughout the process of a safety program, issues are raised, hazards are identified and rules are created. This information must be communicated to everyone involved in a regular and timely manner:

- *Safety/Tailgate Meeting Form*
- **Work Site Briefing Form**
- *Prime Contractor Forms*

During the course of a work day, meetings are scheduled and held all the time. From client meetings, lunch meetings, marketing meetings, finance meetings and maybe even meetings just for fun. All of these meetings are held to communicate certain tasks, goals and/or safety information to certain staff members, and all are important to the operation of a company. Considering the importance of safety in the workplace, safety meetings are also held and are communicated by the following forms:

Safety/Tailgate Meeting Form

Safety Meetings are large scale meetings with everyone at Digital World Mapping to discuss general safety issues such as changes to the ERP, new hazards that were found or a new muster area. They are to be held at least on a quarterly basis by the Manager.

A Tailgate Meeting is typically held in the field to discuss pertinent safety information during work on a client site such as hazardous weather conditions, daily tasks, operations and other safety topics directly related to that day's work. Therefore, Tailgate Meetings should be held on a daily basis by the Project Manager. If the Project Manager is not available for the Tailgate Meeting, senior Workers will conduct the Tailgate Meeting.

SAFETY / TAILGATE MEETING

Safety Meeting (Quarterly)	Tailgate Meeting (Daily)
Right to refuse unsafe work	Hazard Alerts
Company Safety Objectives	Daily Tasks
Safety Management System Improvements and Changes	Hazardous Weather Conditions
Maintain communication with co-workers	Incidents Occurred
Training	Contractors on site
Responsibility to report ASAP all incidents, injuries, damages, spills	Required PPE
All forms submitted to Safety Supervisor (i.e. Hazard Alerts)	Other:
Visually inspect vehicles and PPE before use	Other:
Location of legislation & MSDS	Other:
Emergency Response Plan, supplies, responsibilities, first aiders etc.	Other:
Other:	Other:
Emergency alarm / muster area:	
Employee Feedback:	

Meeting Conducted By:

Signature:

Work Site Briefing Form

Considering the operational complexity of flying an airplane or a helicopter and the severity of incidents that could occur in the field, Work Site Briefings involving Digital World Mapping staff members and Contractors are extremely important.

A Work Site Briefing Form is used to acknowledge that the pilot and Digital World Mapping staff understand the necessary safety requirements and daily tasks.

Only during these times does this form need to be filled out:

• Before the start of a new job

• Changes in equipment, job and/or pilot

• When there are other Contractors present on the site

• When the pilot or Project Manager deems necessary

Records of manifests or other forms used by the pilot should be photocopied by Digital World Mapping and filed in a central location.

Prime Contractor Forms (4 pages)

Digital World Mapping is required by ENFORM to provide forms filled out by Prime Contractors (i.e. clients) that act as references that Digital World Mapping has done its job in the safest manner possible.

The Manager shall ensure all clients have filled one out.

Training & Orientation

Without the proper training and orientation to a new worksite, miscommunication and confusion can occur. All current, new employees and visitors will have their own training & orientation process using the following:

- *Training Model*
- *Employee Information Form*
- *Job Orientation Form*

Training Chart

This training model outlines what training and certification is necessary for Digital World Mapping staff It is not an exhaustive list, but states the absolute minimum requirements. It also states how often to renew a particular certificate, training or course:

OHS: According to Provincial legislation
N/R: Not necessarily required, client required

Training / Course	Renew every:	Trainer	Training Required		
			Manager	Supervisor	Worker
WHMIS	3 years	Internal	Yes	Yes	Yes
Standard First Aid & CPR (Alberta)	3 years	Certified Instructor	Yes	Yes	Yes
Hazards, Incidents, and You	3 years	Internal	Yes	Yes	Yes
Emergency Response Awareness	3 years	Internal	Yes	Yes	Yes
Driving Level 1	3 years	Internal	Yes	Yes	Yes
H2S Awareness	3 years	Internal	OHS	Yes	Yes
H2S Alive	3 years	Certified Instructor	N/R	N/R	N/R
Common Injury Prevention	3 years	Internal	Yes	Yes	Yes
Emergency Response	3 years	Internal	Yes	Yes	Yes
Accident / Incident Investigation	3 years	Internal	Yes	N/R	No
Inspection Training	3 years	Internal	Yes	Yes	Yes
TDG	3 years	Internal	Yes	Yes	Yes
Fire Awareness	3 years	Internal	Yes	Yes	Yes
Electrical Awareness	3 years	Internal	R/W	Yes	Yes
Substance Abuse	3 years	Internal	Yes	Yes	Yes
Helicopter Safety	3 years	Internal	Yes	Yes	Yes
Working Outdoors 101	3 years	Internal	Yes	Yes	Yes
Legislation Awareness	3 years	Internal	Yes	Yes	Yes
PPE	3 years	Internal	Yes	Yes	Yes

Employee Information Form

All Digital World Mapping staff are required to fill out information such as emergency contact information, personal contact information and previous medical conditions (if applicable). Managers are to administer these forms to all staff and also communicate that they are only to be used with medical staff in the event of an emergency or incident.

New Employee Orientation Form

Covering topics such as which details site hazards, location of safety materials, PPE, certificates and other safety topics. The Manager will conduct this orientation for all new employees:

Incident Management & Investigation

On an immediate basis, Emergency Response is the primary section used to control an incident, but once the emergency has been managed, what is next? These tools will enable an organization to find out what caused the incident:

- *Incident Report*
- *Investigation Report*

Definitions

Near Miss: an event, which under slightly different circumstances, has the potential to cause an incident / accident. In other words, something did happen but there was no damage to assets, people, vehicles, or the environment.

Direct Cause: Direct causes of incidents / accidents may be attributed to substandard practices or conditions. These are the hazards that exist immediately prior to the incident / accident. Immediate direct causes are the symptoms of deeper problems.

Indirect Cause: are personal or job factors which contributed to the immediate direct cause. These are the causes behind the symptoms. They are not as apparent as the immediate direct causes.

FAC (First Aid Case): one-time treatment for observation of minor scratches, cuts, burns, etc. with possible follow-up visits for observation but not requiring medical treatment.

Incident / Accident: an event causing damage to assets, people, vehicles, or the environment. (For the purpose of this document 'Incident' will used).

LTI (Lost Time Incident): an incident that causes a person to be away from work beyond the day of the injury or a disabling injury where the employee was not able to show up for his or her regular work shift the next day.

MTC (Medical Treatment): an injury that requires treatment from a physician. The injury is not severe enough to prevent the employee from returning to work the next day.

RWC (Restricted Work Case): a case where an injury or illness occurred yet there is no

Risk: in the context of health and safety, risk is defined as a measure of the probability for an incident to happen and of the potential severity of the consequences.

In the event of an incident, the following reports will help document the facts:

Incident Report

All incidents must be reported by using the Incident Report by the staff member most directly involved in the incident. If the staff member is unavailable (i.e. due to injury), the Project Manager will complete the Incident Report.

Additionally, the Project Manager and Manager is responsible for reviewing all Incident Reports and ensuring proper corrective measures have been placed to prevent similar incidents from reoccurring. The Incident Report is used only to document the facts without placing blame and fault.

The Incident Report should be submitted as soon as possible, but at least within 24 hours.

Investigation Report

Everyone plays a role in an investigation, from witnesses to Project Managers and Managers contacting the proper parties to notify them of the results of the investigation. Managers will be directly involved in the investigation to find out the details of why and how the incident occurred.

Excerpted from Alberta OH&S, *an investigation is to be carried out:*

18(3) If an injury or accident referred to in subsection (2) occurs at a work site or if any other serious injury or any other accident that has the potential of causing serious injury to a person occurs at a work site, the prime contractor or, if there is no prime contractor, the contractor or employer responsible for that work site shall:

* *carry out an investigation into the circumstances surrounding the serious injury or accident,*
* *prepare a report outlining the circumstances of the serious injury or accident and the corrective action if any, undertaken to prevent a recurrence of the serious injury or accident, and*
* *ensure that a copy of the report is readily available for inspection by an officer.*

An Investigation Report must be submitted to a Manager within 72 hours of the incident. However, witness statements should be taken within the same workshift of the witness. All incidents requiring the use of an Investigation Report must also be reported to the client within 72 hours (if necessary).

An Investigation Report is made highly effective when accompanied by photos of the incident, such as equipment/vehicle damage and other details directly related to the incident. Although cameras are not a requirement on the worksite, many workers now have cellphone cameras or digital cameras at their disposal.

The investigation must be carried out by someone who is trained in incident investigations. All incidents must be reported and documented using the Incident Investigation Report.

Contractor Management

Contractors are integral to Digital World Mapping's operations, specifically helicopter pilots and crew. However, Digital World Mapping needs to work with Contractors who abide by their respective industry regulations, rules and procedures. The following form ensures Contractors have an emphasis on health & safety:

- *Contractor Acknowledgement*

Companies considered to be Contractors to Digital World Mapping include the following:

- helicopter pilots and related crew used for Lidarus operations
- airplane pilots and related crew used for Lidarus operations

Contractor Acknowledgement

In order for a Contractor to work with Digital World Mapping, this Contractor Acknowledgement form needs to be addressed and signed by the Contractor before work begins on their first job.

Contractors are expected to acknowledge the following:

- strict compliance with appropriate rules and regulatory bodies (i.e. Department of Transportation, FAA & Transport Canada)
- have a safety program in place
- frequent and documented inspections on applicable equipment
- will provide Digital World Mapping a copy of every flight manifest and site-specific ERP
- pilot will conduct flight safety briefing Digital World Mapping staff at the start of each new job, with a new pilot and/or if the job changes
- participate in Safety/Tailgate Meetings when requested
- will ensure all PPE (i.e. flight helmets) are inspected and properly maintained
- inform Digital World Mapping of any major incidents and/or lawsuits in the past 3 years
- provide proof of insurance

Once these conditions are met and acknowledged, the Acknowledgement will be filed for future reference. It is the Manager's responsibility to ensure Contractors comply with these conditions.