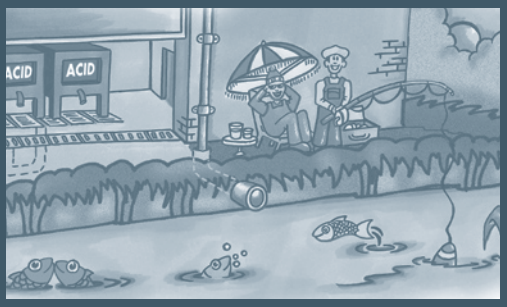
POLLUTION PREVENTION GUIDE:

Storage and Handling



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PPG: Storage and Handling Module

Environment Canterbury

Your regional council

STORAGE AND HANDLING

If the daily activities on your site involve storage and handling of materials such as oil, solvents, acids, paints, cleaners, pesticides and other chemicals then your site has the potential to pollute the environment.

Any material or substance that is spilt onto the ground outside or left uncovered can flow or be washed by rainwater. This can go into the ground or storm water drains where it will contaminate the receiving waters; whether it be a stream, river, the sea or groundwater supply. Even materials not harmful to us such as milk, whey, or sugar can significantly alter the quality of a river or stream.

Common poor storage and handling practices on site include:

- Corroded storage tanks
- Uncontained light materials
- Unlabelled or incorrectly Labelled containers
- Uncovered waste skips
- Hazardous substances storage areas without secondary containment.
- Unsecured loads on forklifts
- Drums punctured by forklifts
- Secondary containment with holes in it
- Lids left off containers
- Storing liquids above dry solids

Improving the way materials are stored and handled on site doesn't require a great deal of money or significant changes to the way you work.

Often it will only take a few minor changes to how you operate, such as labelling containers, or storing materials inside to reduce the risk of a polluting incident occurring.

SECONDARY CONTAINMENT AND ABOVE GROUND STORAGE AREAS

Secondary containment means storing your bulk containers to protect the environment from spills or leaks. Secondary containment can range from major facilities able to contain all the liquids stored in the vessels inside them to rollover bunds which stop spills from indoor workspaces escaping into yards.

Secondary containment lets you detect and control any small or slow leaks and will contain spills from sudden ruptures of tanks or drums.

How big should the secondary containment be?

The size of the secondary containment depends on the size of the containers stored in it. If you are storing hazardous substances, you need to check the secondary containment requirements under the Hazardous Substance and New Organisms Act, 1996 (HSNO). These are set out in the Hazardous Substance (Emergency Management) Regulations 2001. The capacity of the secondary containment required under these regulations varies according to the volume of hazardous substance held within the storage area and the size of the containers.

Your Pollution Prevention Officer can advise you on what you need to do or who you need to contact to resolve any issues.

Things to remember

- Locate pumps, pipes and decanting vessels associated with your containers inside secondary containment. In the event of equipment failure the spill will be contained
- Locate the loading point inside the secondary containment - loading is a high risk activity
- Make sure the floors, walls and joints on pipe work and any sealant used inside the secondary containment are impervious to and compatible with the materials stored
- Maintain the required minimum separation distances for dangerous goods
- Store incompatible substances in separate containment areas
- Tanks and drums should be separated from the inner edge of the secondary containment by a distance of half the height of the tank or stack of drums
- If empty drums are stored, the containment area should be sized as if all drums are full - this will benefit you if your operations change, and future users or buyers of your site
- Consider having separate or compartmentalised containment for different materials - this will help you be able to collect spilled materials for re-use.

Storm water control

If you can't roof your secondary containment, then grade the floor towards a collection sump and drain so you can get rid of uncontaminated rain water. Fit a drainage valve to the sump and keep it closed and locked until you need to drain away accumulated water. Before unlocking and opening the valve, first make sure the water is clean so it won't pollute storm water or soil.

If the water is contaminated, call your waste disposal contractor to remove it or ask your city or district council if you can pump it into the sewer.

Make a reliable staff member responsible for regularly inspecting and draining outdoor secondary containment areas.

Roofing your secondary containment - a simple solution

Avoid human error: roof your secondary containment and do away with the need for storm water valves altogether. Benefits include:

- Preventing accidents from valves being left open after uncontaminated storm water has been drained
- Avoiding the need for staff monitoring
- Protecting valuable stock and equipment from rain
- Making a safer and more pleasant work environment in all weather conditions.

Secondary Containment Mistakes

It is common on many sites to see secondary containment in place but because of poor practice the containment is not working properly. Some common mistakes include:

- Holes in containment walls made to let rainwater out
- Containment walls too low to contain spills and splashes
- Volume of secondary containment is too small to contain the tank's contents
- Capacity of secondary containment is reduced by rainwater
- Pipes and pumps are stored outside the contained area, allowing leaks.

To work properly, secondary containment needs regular inspection and maintenance, use the checklist to make sure you operate your secondary containment areas correctly.

ROOFING YOUR ACTIVITY AREAS FOR POLLUTION PREVENTION

Roofing stops rainfall coming into contact with contaminants and washing them into the storm water system.

If your storage, working or decanting areas cannot reasonably be kept clean then roofing it is the simplest solution.

Use the checklist to work out if that it is cheaper and easier in the long run to roof an area than to put a lot of effort into keeping it clean or managing storm water.

LOADING, UNLOADING AND DECANTING AREAS

There is always a higher risk of spillage in any area where goods are being handled.

This risk can be minimised by:

- Designating and marking loading and unloading areas
- Isolating loading and unloading areas from the storm water system, or locating storm water protection by drains
- Containing leaks and spills during transfer
- Providing a spill station that is easy to access (see Spills module)
- Roofing yard areas used for loading and unloading
- Supervising deliveries of potentially hazardous materials
- Fitting automatic cut-off valves to delivery pipes to prevent overfilling
- Checking and maintaining filling and transfer equipment regularly
- Providing regular staff training in your spill response procedures
- Maintaining staff awareness of your spill control procedures.

REFUELLING

Vehicle refuelling can cause widespread soil contamination and hydrocarbon pollution of storm water. You must prevent these contaminants from entering soil or water. Just one litre of oil can contaminate 1 million litres of drinking water, oiling birds and creating a barrier preventing essential oxygen from getting into the water body.

Any staining around refuelling areas is evidence that leaks and spills are occurring. Some simple good practice techniques can prevent this happening.

Check the refuelling area for the following:

- All tanks have secondary containment
- No signs of damage or corrosion
- Pipes valves and gauges are within the secondary containment
- It is isolated from the drainage system
- A spill station is located nearby (see Spills module)
- Pumps are fitted with automatic cut off switches.

When refuelling, all staff should ensure that:

- Refuelling doesn't start until the nozzle is within the vehicle
- The nozzle isn't removed until the flow of fuel has stopped
- Any spills that do occur are cleaned up quickly and disposed of correctly
- Pipes and nozzles are stored correctly within the secondary containment when finished.

Use the checklist to make sure refuelling on your site is not causing a contamination problem for you or the ground and surface water in your neighbourhood.

WASTE OIL STORAGE TANKS

Waste Oils are any petroleum-based or synthetic oil that, through use or handling, has become unsuitable for its original purpose due to the presence of impurities or loss of original properties. During use oil becomes contaminated with a range of substances that are hazardous to human health and the environment, including heavy metals and hydrocarbons, some of which are potential carcinogens. Any material or substance that is left uncovered or on the ground outside can flow or be washed by rainwater into a nearby storm water drain where it will result in the pollution of the local stream, lake, beach or groundwater.

Oil can partially dissolve in water introducing toxic substances into the environment. These include heavy metals such as lead and chromium and hydrocarbon compounds that are a by-product of vehicle operation.

These types of substances can cause harm to the environment by:

- Poisoning animals and plants
- Forming an oily layer or film on surface water and preventing oxygen and sunlight from entering the water, making it difficult for animals to breathe and find food and for plants to get energy
- The chemicals building up in the bodies of plants and animals potentially causing long-term health effects
- Contaminating the land and underlying groundwater systems.

UNDERGROUND STORAGE TANKS

Underground storage tanks (UST) are used to store a variety of hazardous substances including petrol, diesel, oil, kerosene and industrial solvents. Leaks from USTs present a major threat to groundwater quality and can contaminate surrounding land, affecting its use.

In Christchurch (and in many other parts of Canterbury) groundwater from underlying aquifers is the sole source of public drinking water and serious water pollution can result from any leaks into aquifers.

Up to June 2000, the installation of new or replacement USTs required a resource consent from Environment Canterbury. Resource consents set conditions to prevent and detect leaks and spills and required that installation, design and day-to-day operation was in accordance with the Department of Labour's Code of Practice for the Design, Installation and Operation of Underground Petroleum Storage Systems.

Since June 2000 a regulatory change has permitted the installation of some USTs without consent provided they meet certain conditions. These conditions cover the design, installation and maintenance of USTs, refer to chapter 4 of the proposed Natural Resources Regional Plan (pNRRP).

STOCKPILES

A common storage problem is water infiltrating stockpiled materials such as topsoil, sawdust, gravel and compost. Stockpiles exposed to rain will contaminate storm water running off your site. This is against the law.

Common types of stockpiled materials that can contaminate surface runoff:

- Treated timber which may contain copper, chrome, arsenic or boron
- Metal dumps which may contain oil
- Bare soils or other sediments which can smother stream life
- Organic materials such as compost and green waste will use up oxygen if washed into waterways.

WASTE

Waste must be stored in a way that will not harm the environment. Pollution of the environment from poor waste storage occurs in many ways:

- Contaminated liquid leaking from skips and entering storm water drains
- Poorly contained waste being blown off site
- Contaminated waste spilling onto unsealed surfaces
- Incorrect waste segregation resulting in incorrect disposal.

Handling and storage of waste on site can be improved using some simple techniques:

Labelling

Labelling skips and waste containers prevents the wrong type of waste being put in the wrong container. Failure to do so can result in staff injuries, inappropriate disposal and increased disposal costs. Labels should be:

- Easy to read
- Accurate
- Up to date.

Lids

Many skips have lids and covers but often they are not used. Using lockable skip covers prevents:

- Rain entering skips
- Waste being blown out of skips
- Vandals interfering with the contents of skips
- Others adding to your waste.

Location

The location of skips and containers on your site is important. There should be a dedicated waste storage area that is marked out and labelled. Ideally skips should be located:

- Away from members of the public or vandals
- Away from storm water drains
- On sealed ground.

IN THIS MODULE

	Done	Date
Storage		
Secondary Containment		
Roofing for pollution prevention		
Permeable paving		
Refuelling		
Underground storage tanks		
Stockpiles		
Waste storage		
Site signage and labelling		
Other (specify)		
Cross check		
Action list		
Signs of success		

STORAGE

If you store materials in such a way that they cause pollution you are legally liable. It is your responsibility to take all reasonable steps to eliminate or minimise the risk of pollution from stored material on your site.

NO ☐ YES ☐

1. Do you have an inventory of all substances you keep on site?

   You should have an inventory of each place where you store:

   - Hazardous substances
   - Raw materials
   - Finished product
   - Waste, by-products, materials for re-use or recycling, including out-of-date stock or material you no longer use
   - Fuels, lubricants, cleaners, and other non-process substances.

If NO use the Inventory Sheet at the end of this module to compile your lists for each place materials are stored, for example, your hazardous substances store, warehouse, outdoor compounds and so on. The Inventory Sheet includes information on the following:

- Material: brand name
- Description: indication of the composition of the material
- Quantity: maximum quantity found on site at any time
- Storage method: type of container (drum, tank, packages, pile etc),
- Hazardous properties: refer below.

Hazardous substances are grouped according to the following properties:

- Explosiveness (e.g. fireworks)
- Flammability (e.g. fuels, solvents)
- A capacity to oxidise (e.g. peroxides, hypochlorites)
- Corrosiveness (e.g. acids, ammonia)
- Toxicity (e.g. pesticides, some industrial chemicals)
- Ecotoxicity (e.g. pesticides, chemicals, oils).

Other substances like food or beverages that do not fit into the categories on that list should be classed as harmful to the environment and living things - because of the harm they can do if spilled into water.

Poor storage of material increases your environmental liability. Reduce your risk by going through the checklist below.

2. Tick the boxes if you store:

- ☐ Waste oil
- ☐ Bulk foodstuffs or beverages
- ☐ Detergents
- ☐ Cleaning agents
- ☐ Hazardous substances
- ☐ Stockpiled materials including anything in bulk.

Biocides such as:

- ☐ Weedkillers
- ☐ Insecticides
- ☐ Fungicides
- ☐ Rodent baits

3. Are all materials stored either: NO ☐ YES ☐
   - Indoors, or
   - Outside in appropriate containers on paved impermeable areas free of cracks and gaps, and
     - Under a roof or a well secured water proof cover, and
     - In an area with secondary containment which prevents storm water entry.

4. Do you have Safety Data Sheets (SDS) for all substances held in more than household quantities? NO ☐ YES ☐

If NO obtain any missing SDS from the product supplier or the New Zealand Chemical Industry Council 04–499-4311 and file them at the end of this module or in a separate folder. Someone on site should be given responsibility for making sure all SDS are up to date and no more than 5 years old.

Hazardous Substances

5. Do you store any of the following on your site: NO ☐ YES ☐
   - Petroleum products
   - Chlorinated hydrocarbons
   - Pesticides
   - Timber treatment preservatives
   - Substances containing one or more of the following chemicals: arsenic, cadmium, chromium, cyanide, lead, mercury, or nickel.

If you answered YES to any of the above, then you may need either resource consent from Environment Canterbury to use and store these hazardous substances according to ECan's regulatory requirements. Contact ECan's Customer Services 0800 EC INFO (0800 324 636) or (03) 353 9007 for further information.

NO YES N/A

6. Are all hazardous substances on site stored and labelled according to HSNO and your city or district council's District Plan?

If you answered NO to question 6, look at Useful Contacts fact sheet for details of where and how to obtain further information.

The Hazardous Substance (Emergency Management) Regulations 2001 lay out the storage and handling requirements for hazardous substances, it is your responsibility to make sure your site is compliant. Pleading ignorance of the relevant legislation is not a defence in a court of law.

SECONDARY CONTAINMENT

NO YES N/A

7. Do you have secondary containment around tanks and drum storage areas on your site?

   This includes smaller outdoor storage areas with low nib walls to prevent storm water running into them and secondary containment around other potential sources of leaks such as valves, pumps, flanges and so on?

NO YES N/A

8. Do all your secondary containment areas meet the volume requirements of HSNO?

NO YES N/A

9. Does your outdoor secondary containment have either:
   - A roof to prevent the secondary containment filling up with rain water, or
   - A valve to release uncontaminated rainwater to the storm water system and a vandal-proof storm water drainage valve locked in the 'off' position, with the key held by a responsible staff member?

If you answered NO to any of the above three questions, consult the secondary containment requirements for HSNO set out in Hazardous Substance (Emergency Management) Regulations 2001. See Useful Contacts fact sheet for details on how to get further information on this.

NO YES N/A

10. Can the secondary containment cope with a rupture, failure, or spill from all associated pumps, pipes, fill points, and any decanting from your bulk containers?

NO YES N/A

11. Are floors, wall and joints on pipe work and any sealant used impervious to and compatible with the materials stored within the contained area?

NO YES N/A

12. Are incompatible substances stored in separate containment areas with the required minimum distance maintained?

13. Does any unavoidable runoff from storage areas without secondary containment go to:
    - An appropriate on-site treatment or disposal facility for which you hold the appropriate resource consents from Environment Canterbury, or your city or district council, or
    - A sump or other containment areas for removal by a liquid and hazardous waste contractor.

NO ☐ YES ☐ N/A ☐

14. Do you take reasonable care to ensure that storage areas or facilities are secure from vandalism?

NO ☐ YES ☐ N/A ☐

If NO, you need to consider that you are at risk of causing pollution from your site and therefore you need to act to minimise your risk.

You are potentially liable for any pollution from your site regardless of whether a third party or unauthorised person is the cause of the contamination.

Best Practice:

Have you considered having separate or compartmentalised containment areas for different material to help you collect spilt materials for reuse?

Are tanks and drums separated from the inner edge of the secondary containment by a distance of half the height of the tank or stack of drums?

Loading, unloading and decanting areas

Loading, unloading and decanting are potentially high risk activities where spills are most likely to happen. Work through the following questions to help you reduce your liability at these times.

15. Do you load or unload directly above or next to a storm water drains?

NO ☐ YES ☐

If YES, consider using a different area, supervising the deliveries or the following:
- **A Spill Station OR**
- **Storm water protection system such as drain mats, shut off valve or interceptor OR**
- **Low nib walls or appropriate grading to contain spills?**

You need to consider that you are at risk of potentially causing pollution from your site and therefore you need to act to minimise your risk.

Best Practice?

Do your staff prevent spills by using funnels, drip trays, buckets or other devices to catch decanting losses and to drain pipes after filling and when transferring materials from one container to another?

ROOFING FOR POLLUTION PREVENTION

NO ☐ YES ☒ N/A ☐

16. Have you ever had problems with spills or leaks, or has your site audit identified past or potential problems from the following areas:
    - Loading, unloading and decanting
    - Outdoor secondary containment
    - Refuelling
    - Oil storage
    - Wash down
    - Outdoor storage
    - Waste storage.

NO ☐ YES ☐ N/A ☐

17. Can your staff reasonably be expected to keep these areas clean?

If you answered YES to any option in Question 16 and NO to Question 17, then roofing is a good option to reduce contaminated runoff from your site. Roofing is a better long term option for areas that cannot easily be kept clean. You should also divert storm water away from the area.

Best Practice

Remember - you may save money in the long run by roofing an outdoor area if your staff can carry on working in the rain!

PERMEABLE PAVING

NO ☐ YES ☐

18. Do you have or are you considering putting permeable paving on your site for storm water control?

If YES, do not use in areas where drips, spills or other contamination is likely to occur.
Check with your Pollution Prevention Officer as some activities are prohibited from operating on permeable paving.

REFUELLING AREAS

NO ☐ YES ☐ N/A ☐

19. Is there any black or oily stained ground by your fuel/oil depot?

If YES, this indicates that spills and leaks are occurring during refuelling. Usually spills and leaks occur because of poor working practices. You need to investigate and find out how and why this is happening.

NO ☐ YES ☐ N/A ☐

20. Are your refuelling areas:
    - Paved and sound (no cracks or gaps)
    - Drained into interceptors with shut off valves to contain spills
    - Designed as spill containment pads
    - Protected from storm water running onto them?

21. Is there spill response equipment located close to the refuelling area?

NO ☐ YES ☐ N/A ☐

If NO, our rules require spill response equipment to be accessible and easily identifiable.

22. If a spill occurs during refuelling is it routinely cleaned up and disposed of correctly? (Complete the Spills Module to find out more).

NO ☐ YES ☐ N/A ☐

If NO, you are potentially at risk of committing an offence by illegally discharging containments to land or water.
If you store large quantities of substances you should check with your Pollution Prevention Officer as there may be some further requirements.

23. Do your staff prevent spills and leaks during refuelling by ensuring that:
    - Refuelling doesn't start until the nozzle is within the vehicle
    - Staff observe refuelling at all times
    - The nozzle isn't removed until the flow of fuel has stopped
    - Pipes and nozzles are left within the secondary containment when not in use.

NO ☐ YES ☐ N/A ☐

If you answered NO or are having reoccurring problems, consider the Best Practice Options below.

Best Practice:

Your fuel dispensing hoses should have automatic shut-off valves to reduce the likelihood of spills from overfilling?

All fuelling hoses used on the site should have 'weak links' with shut-off valves to prevent drive-away problems or to allow shut-off if unforeseen breakages occur.

UNDERGROUND STORAGE TANKS

Not all underground storage tanks (UST's) are for petroleum products, but they all need careful monitoring. It is in your own interest to minimise leaks and avoid liability for water pollution or site contamination.

24. Do underground storage tanks on your site either:
    - Have resource consent from Environment Canterbury, or
    - Meet the operating standards required to be a permitted activity?

NO ☐ YES ☐ N/A ☐

If you answered NO to both parts of this question then you need to contact Customer Services (03) 353 9007 and 0800 EC INFO (0800 324 636) at Environment Canterbury to find out whether or not you need a consent for USTs on your site.

25. To clarify issues of liability, you need to know who actually owns the tanks. Are ownership issues clear and well understood by all parties, including:
    - The company which owns the tank and pipes, if this is not your firm
    - The company which fills your tank
    - Your staff, who do the reconciliation of inputs and outputs?

NO ☐ YES ☐ N/A ☐

NO YES N/A

26. Do you know the following information about the tank/s on your site, to reduce the risk of contamination, have the owners informed you about:
    - The age of the tank/s
    - Cathodic protection
    - Vulnerability of pipe work to damage
    - Spill containers/overfill preventers
    - Pipework and tank leak detection systems.
    - Soil corrosivity and tank materials
    - Tank coating to minimise corrosion
    - Secondary containment for leaks
    - Site stability

If you do not have this information, contact the tank owners. They should be able to provide the above information.

NO YES N/A

27. Do you undertake regular stock reconciliation of the product held in your tanks?

If NO, then you need to begin stock reconciliation immediately. If you are unsure how to do this then contact the company supplying you with product for assistance.

STOCKPILES

Stockpiles exposed to rain will contaminate storm water running off your site. This is against the law.

NO YES N/A

28. Are stockpiles of materials like timber, metal products, topsoils, sand, gravel, compost, sawdust and wood chips securely covered to keep rain from washing pollutants into storm water and to stop them blowing away?

NO YES N/A

29. Is runoff from stockpiles which are not protected from rain, collected, treated and discharged to the sewer, or are resource consents held for this discharge?

If NO, call Environment Canterbury and talk to a Customer Services Officer (03) 353 9007 and 0800 EC INFO (0800 324 636) for advice.

You and your staff are responsible for any discharges from small stockpiles (wind blown or washed out through rainwater) that enters the environment or that continues to have an effect beyond the property boundary line.

WASTE STORAGE

NO YES

30. Are all waste skips located:
    - On sealed ground
    - Away from storm water drains or within secondary containment areas
    - Undercover or fitted with lids?

NO YES

31. Could vandals access skips on your site during non-working hours?

32. Does a staff member on site check the contents of skips on a regular basis to make sure that only the correct type of waste is being disposed of?

NO ☐ YES ☐

If NO to any of the above questions, you may be causing pollution of storm water or ground water. You should consider moving the skip/s to another location or managing your skip to minimise the risk of pollution. Ensure your skip is sound and sealed, with no missing bungs, this will ensure no liquids escape.

Storage of waste hazardous substances

If you use any hazardous substances on your site what happens to any waste product? Any waste hazardous substance should be stored with the same precautions as the new product.

SITE SIGNAGE AND LABELLING

To ensure that materials are stored, handled and disposed of safely it is important that storage areas and containers are correctly labelled. Any wrong or unclear labelling can lead to health and safety incidents, illegal disposal or process mistakes which can prove costly.

Clear, prominent signs will help visitors, contractors and staff with everyday operations as well.

33. Are the contents and hazard of the following clearly labelled:

NO ☐ YES ☐ N/A ☐

- Hazardous substances and bulk stores
- Above ground storage tanks
- Underground storage tanks
- Hazardous wastestorage tanks
- Waste skips
- Waste oil containers.

MORE DETAIL FOR YOUR SITE

As you walk around your site and make new observations, there may be extra things you see that you want to add. If so, add them here. It is useful to take a picture of issues that you see for future reference.

ITEM: _____

ACTION: _____

_____

ITEM: _____

ACTION: _____

_____

ITEM: _____

ACTION: _____

_____

CROSS CHECK

NO ☐ YES ☐

34. If as a result of your storage and handling inspection you do any works that affect your drainage system, update your drainage plan.

NO ☐ YES ☐

35. Are the following key items covered in your staff training programme:
    - HSNO Regulations 1996
    - Underground storage tanks, and
    - Filling and material transfer procedures that minimise spills.

ACTION LISTS

If you ticked a ☐ (highlighted box) then this is an action you need to take.

Put all actions on a copy of the ACTION LIST at the end of this module.

SIGNS OF SUCCESS

By the time you have gone through the Storage and Handling checklists you should have achieved these key successes:

☐ Storage areas are contained, covered or managed to prevent contamination from spills and leaks

☐ All storage tanks are sound

☐ Accurate records are kept to detect any losses

☐ All storage areas are accurately and clearly labelled.

INVENTORY LIST

Material	Description	Quantity	Storage Method	Hazardous Property

INVENTORY SHEETS

File your Inventory sheets behind here

LAST UPDATE ON:	OTHER COPIES HELD BY:	COPIES UNDATED ON:
DATE	NAME	DATE