Emergency Back-up Planning

Guideline No 4

An emergency back-up plan provides direction when an emergency has occurred, such as a power failure. Putting a plan in place will minimise disruptions to dairy production operations and to the environment.

This guideline provides suggestions for various events that may occur in the dairy operation that will have an impact on the dairy effluent management system.

If you do not currently have an emergency back-up plan, it may be a good idea to review your operation and put one in place.

What is your Back-up Plan?

Operators of dairy farms should have effective procedures and plans in place to respond to emergencies or contingencies, which can impact on the operation of their farm. By having plans in place, the emergency can be managed more effectively with less disruption to production and less impact on the environment.

This guideline lists some of the possible events that should be considered when setting up a management system for dairy shed effluent. The list is not exhaustive as there may be other emergencies that could impact on your operations. It is important that you identify these and put plans in place to deal with them should they arise.

Disruption to Power Supplies

Many effluent systems require electricity to operate pumps for effluent transfer or irrigation. Where the collection point at the dairy is not large enough to hold the effluent from one milking, the effluent must be pumped direct to pasture or storage during yard and plant cleaning. A plan to deal with the loss of power at milking time is needed. An electric generator large enough to manage the milking shed and effluent system is one option.

Installation of a short term holding tank that is large enough to hold the effluent from two days is another option. This tank should be able to be filled by gravity flow (no pumps) and kept empty so that it is always available for an emergency. When the tank is used the contents will need to be agitated to ensure that solids are re-suspended before the effluent is removed.

Round tanks are better than square tanks because square tanks have “dead” corners in which solids can accumulate. Agitation and removal can be done using a slurry tanker.

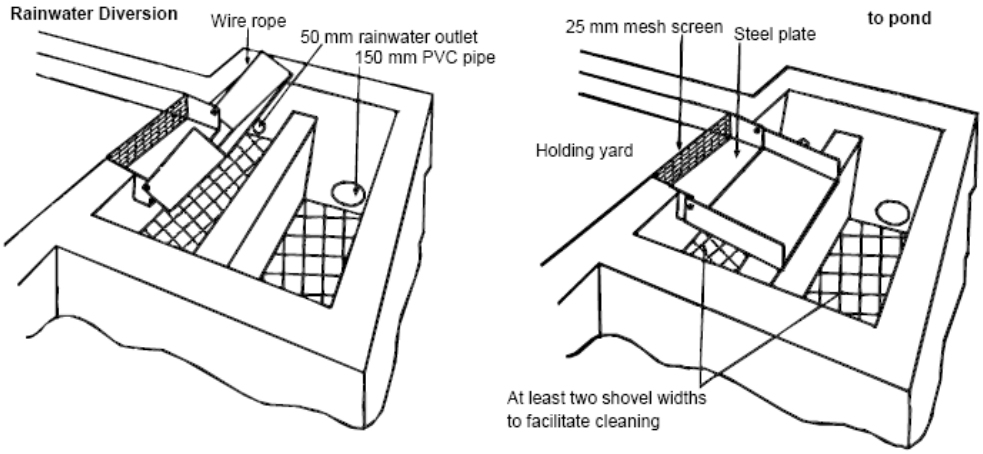
Disruption to Shed or Effluent Operations by Natural Disasters

What impact could storms, flooding or fire have on the operation of the effluent management system?

Ensuring that the nib wall around the yard is high enough to prevent surface runoff entering the yard can prevent the entry of stormwater from areas above the dairy yard. In hilly high rainfall areas the nib wall may not be adequate and diversion banks or drains may be required upslope from the dairy. Similarly diversion banks can be used around ponds, or ponds can be constructed as a turkey nest to prevent surface stormwater entering the effluent storage system.

Stormwater from the dairy roof should be diverted into a tank for use in the dairy or as stock water. Stormwater could also be diverted into a stormwater drain.

Stormwater falling on the cleaned yards can be diverted away from the pond using a device that sends effluent to the pond during milking and yard cleaning. It can then be switched to divert stormwater from the clean yards away from the pond. This can save 15 to 20% of the pond volume for an average system.



Source Dept of Primary Industries Victoria Agnote AG0433; Dairy Effluent: Minimising dairy shed effluent.

How to Prevent Breakdowns in the Dairy Effluent Management System

Blockages of Drains

- Maintaining free-flowing drains is better than having to deal with an effluent spill brought about by blocked drains.
- Drain blockages can be caused by accumulations of solids, which can result in effluent escaping from the effluent management system. Constructing drains with a slope and profile that can transport solids is the first step in avoiding the problem. Drains with a “V” profile will move solids better than a flat bottom or trapezoid drain profile.
- Avoid sharp changes of direction in drains and allow access for cleaning out any blockages. Prevent vegetation from growing in drains or on the banks.
- Regular inspections may be necessary to keep the drains flowing freely. Whose job will this be and how often?

Blockages of Irrigation Pipes

- Select the correct type and size of pipe for the job it must do.
- Refer to the “Pipes” section ***in Guideline No.9 - Equipment***.
- Irrigation pipes and sprinklers can become blocked by solids in the effluent. This affects the evenness of distribution of the effluent or could fracture pipes due to excessive pressure.

- Installing a solids separation system (***Refer to Guideline No. 7 – Solids Separation Systems)*** can reduce the amount of solids in the effluent for irrigation and reduce the incidence of blockages. Matching nozzle sizes and types to the solids in the effluent is also important in reducing blockages.
- Avoid right angle bends in irrigation delivery pipes. Right angle bends are notorious for blockages.
- Regular inspections of the irrigation system while it is working are important in reducing the impact of any blockages. Whose job will this be and how often?
- Can you install an automatic pressure cut-out switch which operates when blockages occur?

Pump Failures

- When you mount the pump, put it where you can get good access for maintenance and repairs.
- Pumps can fail for a variety of reasons. If parts and technical support are available locally you could be running again within a day - if they are not, it will take longer.
- Do you have another pump available, which could run the effluent system until the main one is repaired?
- Can you store the effluent in a holding tank with capacity for at least two days? This will give some breathing space to allow repairs on the pump. If repairs take longer than two days, can you contract the use of a slurry tanker to remove the effluent until the pump is repaired?

Slurry Tanker Breakdown

- Breakdown of your slurry tanker probably means you will not be able to empty the collection sump at the dairy until it is repaired.
- What parts of the tanker are most likely to give trouble? Are spare parts available locally? Do you need to have spare parts on hand?
- Can you store the effluent in a holding tank with capacity for at least two days? This will give some breathing space to allow repairs on the tanker. If repairs take longer than two days, can you contract the use of a slurry tanker to remove the effluent until the tanker is repaired?

Overloading of Ponds

- Pond overload can occur because of increased amounts of solids entering the pond (more cows are being milked than the pond was designed to handle), or the ponds were not emptied sufficiently before winter and there is not sufficient available capacity to store the winter effluent. A freeboard of 600 millimetres above top water level must be maintained in all effluent ponds. Allowing the effluent level to encroach into this mandatory freeboard is an offence under the Environment Protection (Water Quality) Policy 2003.
- Overloading of ponds with solids will produce septic conditions in the pond, with the formation of a thick crust and high sludge levels. The biological activity in such ponds is reduced and odours may become a problem. The pond will need to be de-sludged and more frequent de-sludging will probably be necessary in future unless the loading rate of solids can be reduced.
- Can you reduce the solids entering the pond by installing a solids separation system? (***Refer to Guideline No.7 – Solids Separation Systems***).
- Overfilling of ponds can be avoided by ensuring that the ponds are emptied sufficiently to accommodate the effluent that must be stored over the winter period. If storage capacity is still a problem, can you reduce the amount of water used at the dairy? If storage is still a problem can you install an additional storage pond?

How to Minimise Accidents that have an Impact on your Dairy Effluent Management System

Human Error

- Mistakes happen. Pumps may not be turned on – or off, taps may be forgotten, tanks overflow, the irrigator is not moved – many things could happen!
- What are the most likely mistakes that could happen in your effluent management system? Make a list of them and write down what would need to be done to resolve the situation next to each one. Discuss the list with your employees so that they know what is expected.

Hazardous materials entering waste stream

- Spillages of pesticides, disinfectants, veterinary chemicals etc. should be excluded from effluent systems as they may harm beneficial organisms and crops.
- Can any spillages of hazardous materials be contained before they enter the main effluent stream? A short-term holding tank that is large enough to hold the effluent from two days is an option. This tank should be able to be filled by gravity flow (no pumps) and kept empty so that it is always available for such an emergency. Contact a waste removal contractor who is licensed to handle hazardous materials for removal of the hazardous waste.

Loss of Trained Staff

- Trained staff are one of your greatest assets. Their loss will impact on the operation of the whole dairy enterprise. Replacing them can be difficult and employing staff who can manage the effluent system may not be easy – it is not viewed as an “attractive” job.
- Does every staff member know how the effluent system operates? Do you have an operating procedures manual that describes how to operate the system and its components? Are employees inducted and run through the standard operating procedures?
- Can you contract someone to manage the system until a new employee is found and trained?

Milk Cannot Be Collected

- Milk that cannot be collected must be disposed of. Disposing of the milk in the effluent system is NOT the preferred option. Large effluent ponds will accept up to three days milk within a fortnight; more than this is likely to produce odours and a reduction in treatment efficiency. Ponds that have had large amounts of milk added may take many months to recover and severe odour problems could occur for a number of months to follow.
- Milk is about 100 times more potent as a pollutant than dairy shed effluent. As much as possible should be fed to animals. The remainder may be mixed with water at a ratio of one part milk to at least 10 parts water and irrigated onto pasture. Fresh water should follow to wash the milk off the leaves.
- In areas with suitable soils it may be possible to dig a trench capable of holding two days milkings. This method of disposal is not suitable in areas with permeable soils or shallow groundwater.

Leakage From Ponds

- A properly sealed effluent pond is essential. Effluent ponds, if not properly sealed, are a potential source of pollution to groundwater. An effluent pond that never fills is a sure indication that leakage is occurring. All ponds must be sealed with clay or some other impermeable lining material.
- The lining of the effluent ponds will deteriorate over time. HDPE liners are chemically inert but will degrade over time due to the effects of sunlight. Indicative lifespans for sections of liner exposed to sunlight are about 25 years for 1.5 millimetre HDPE liner, and up to 35

years for 2.0 millimetre liner. Clay liners should have a lifespan of more than 30 years but this will depend on the thickness of the clay blanket, which has been installed.

- If an effluent pond is leaking the leak must be fixed. This will entail emptying some or all of the effluent from the pond and spreading onto land at rates which the nutrients can be assimilated by the plants growing there.
- The site of the leak must be located and plugged with clay or a synthetic liner installed in the pond. Synthetic liners should be replaced at the end of their lifespan.