Conference 2024

New Zealand Trade and Industrial Waste Forum (since 2010)

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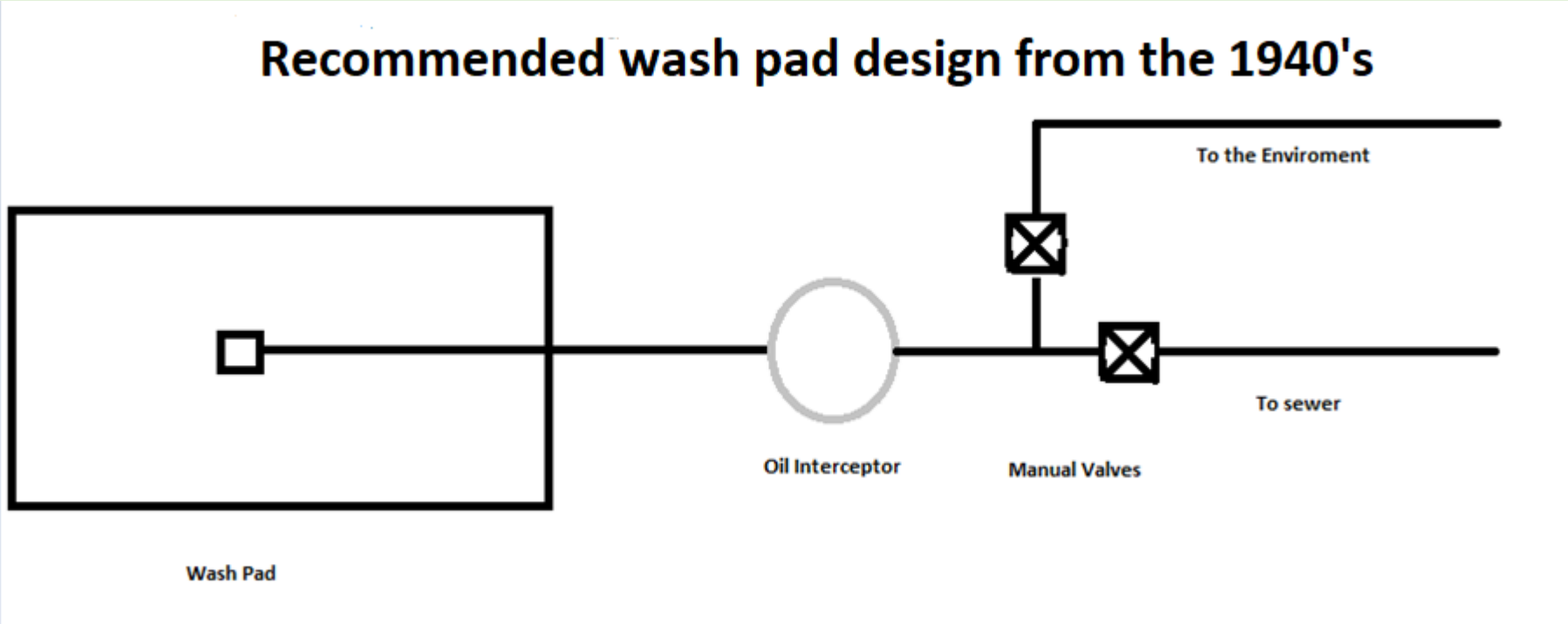
Wash ~~Room~~ Pad Systems which are NOT Roofed

Typical early RV setup consisting of the long drop toilet seat and the orange cassette to capture #1s and #2s

Best use of road Cones yet

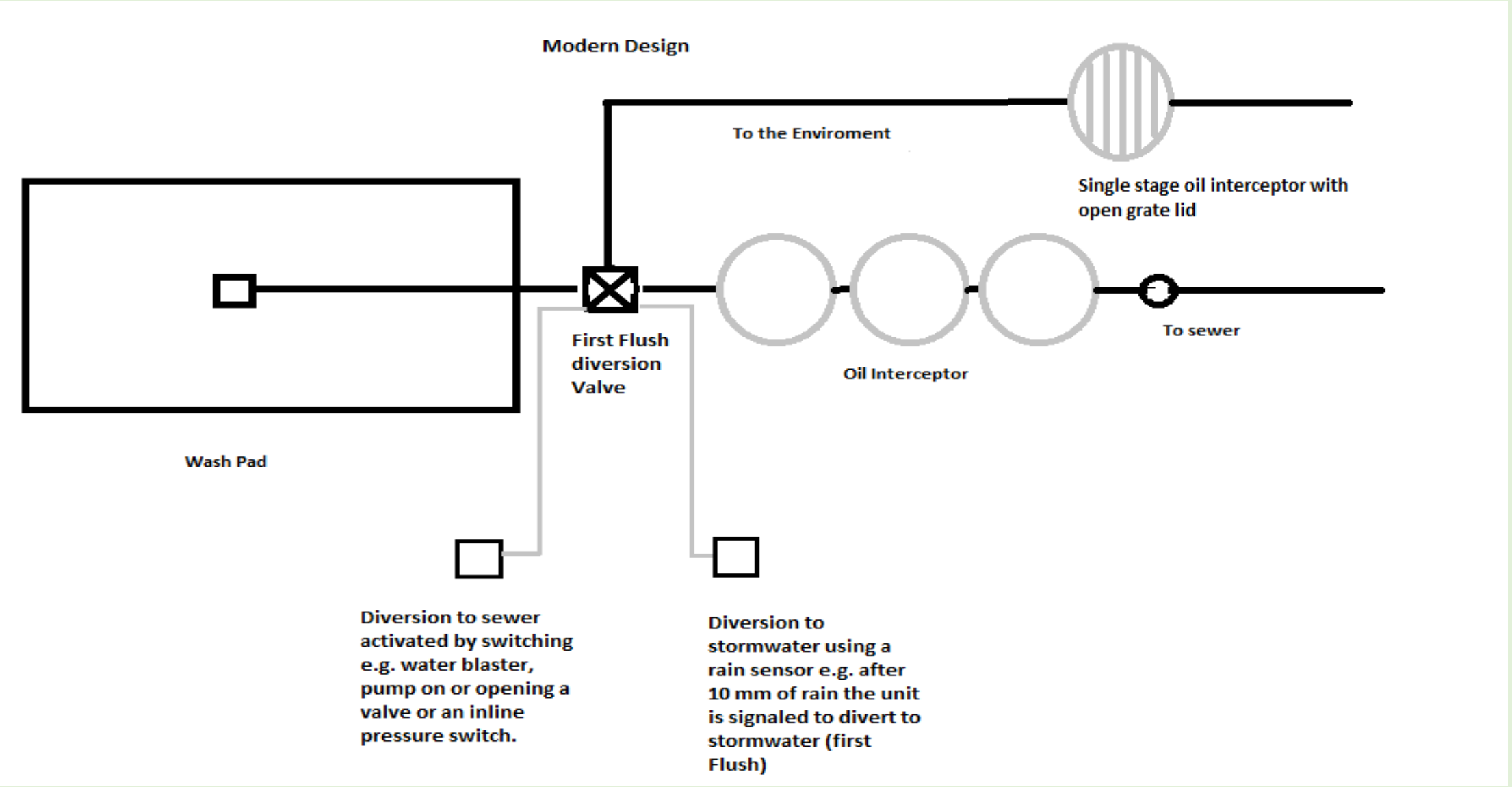
Wash Pad Diversion Systems date back at least 70 years

- 1948- Ministry of Works published manual for designs associated with infrastructure. This included the design for building an uncovered wash pad with a diversion system that consisted of manual valves.



- This design continued for decades. It's not uncommon to still have operational wash pads designed similarly.

Today's Wash Pad Facilities



This is a typical design with one exception- the single stage oil interceptor on the stormwater line has been added (North Taranaki)

Pro’s and Con’s of Uncovered Wash Pads

Pro’s

- There is no height restriction for equipment e.g. excavators dump trucks.
- It is cost effective.
- The wash pads tend to be left a lot cleaner due to consent requirements requiring that they be cleaned after each use.

Con’s

- They need to be checked and maintained.
- Some diversion systems are not suitable for the application.
- If not maintained to a high standard they are likely to breach their Trade Waste Consent or the Bylaw.
- Some TWO’s believe uncovered wash pads don’t work (are bloody useless)

Why do first flush systems have a bad name?

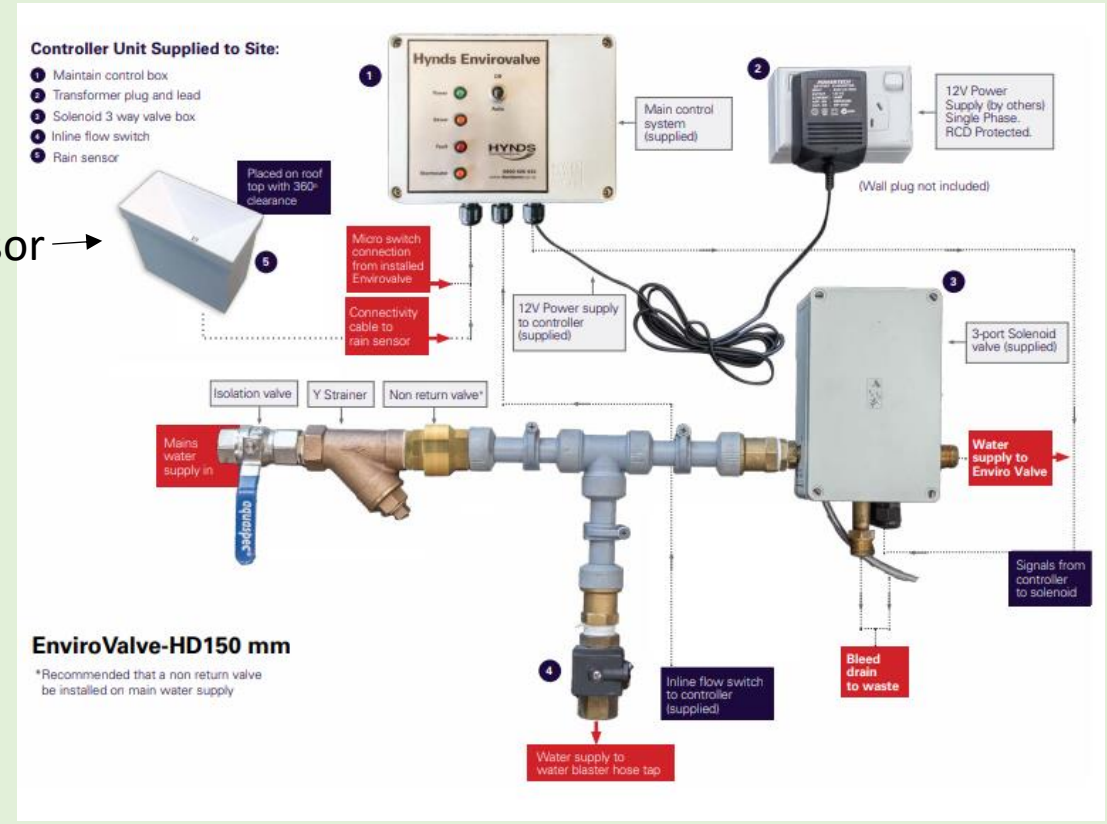
- Staff using the wash pad have limited knowledge of how the systems work or what checks and maintenance are required.
- A lack of monitoring and enforcement by local authorities.
- First flush diversion systems were dominated by two manufacturers: Envirovalves, and to a less degree Fox valves. Both are prone to failure due to solids and debris getting past their basket strainers.
- First flush systems with rain sensors are difficult to test during inspections as the rain sensors are generally mounted near the peak of a roof on industrial buildings therefore when they fail it is not evident to the occupier or the TWO.

Current First Flush Diversion Systems

The First Flush Diversion Systems

Hynds Envirovalve

Rain sensor →



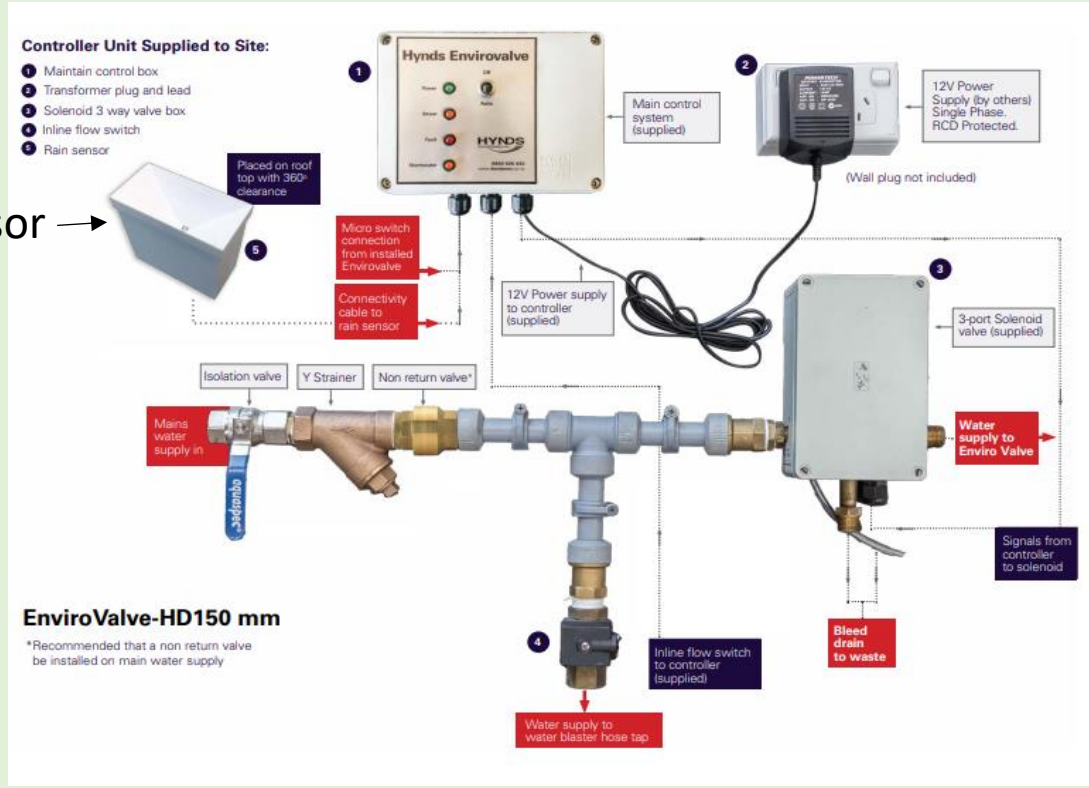
- **Enviro Valves are best for low contaminated trade waste.** – Their basket screen before the diversion valve removes stones, sticks, sand, and silt etc. Should solids get past the screen then there is a reasonable chance the screw system will fail. Installs in New Plymouth have needed the valve removed for repair on multiple occasions.

The First Flush Diversion Systems

Fox Valve First Flush System

Fox Valve diversion system

Rain sensor →



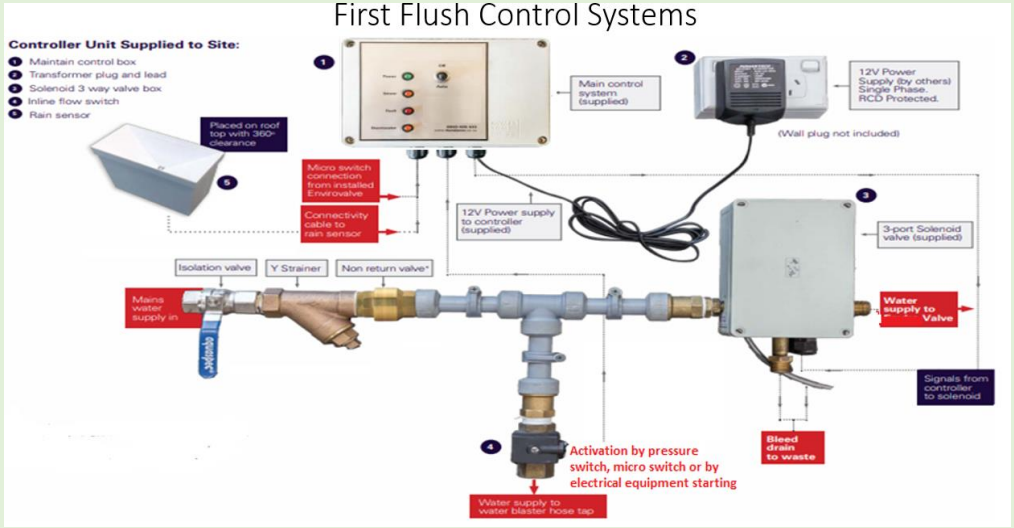
Control system trigger to sewer and trigger to stormwater

- **Fox Valve systems are also best suited to wastes which don't contain a lot of solids.** They are more reliable but if not maintained to a high standard they will fail. When both diversion systems fail to shut, they go into fault mode and activate a sounder. Users generally then turn the power off.

The First Flush Diversion Systems

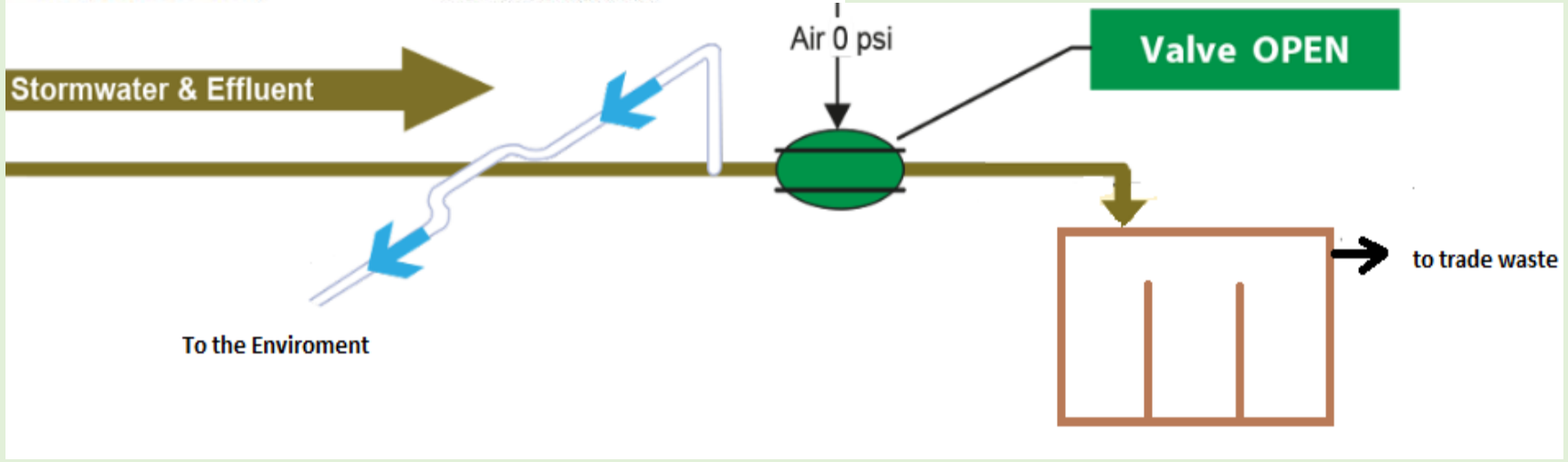
Safe Valve Diversion systems

First Flush Control Systems



Valve Open (de-activated)

Valve closed (activated)

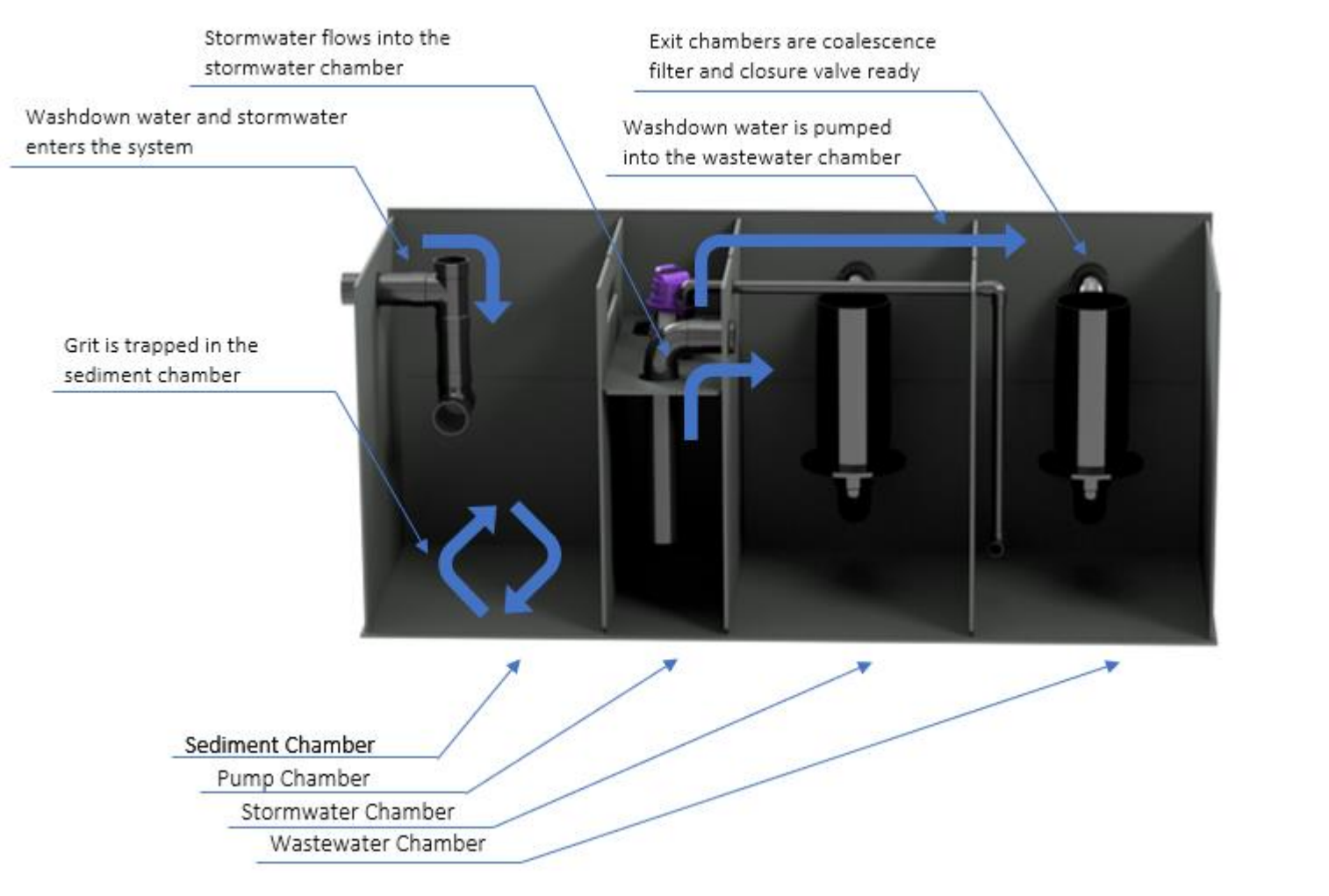


- **The Safe Valve System is non-clogging which eliminates past issues.** They can have a basket installed in the sump prior to the diversion valve. My opinion, and with 15 years experience using these valves is that this system has revolutionised the reliability of diversion systems.

Fuel, Oil Stormwater Diversion (FOSD)

The trade waste/stormwater diversion system Specialising in discharges to sensitive environmental areas

(see Steve @ the Mactrap stand)



Where there are very tight conditions on either the stormwater or the trade discharges, Coalescence filters can be installed

The FOSD system has been developed by Mactrap, they are particularly suited high-quality discharges to sensitive environments

Analytical results from sampling oil interceptors

Trade Waste Sampling Results (acceptable results?)

Company A

Laboratory Analytical Report

Client: WaterOutlook NPDC

Contact:
Phone:

Sample Description:	
	The BOD dilution water blank a

Test Date	Analysis	Result:
15/09/23	pH	7.5
15/09/23	Suspended Solids	121
15/09/23	BOD_5(Carbonaceous)	52
18/09/23	Oil and Grease	140

Company B

Laboratory Analytical Report

Client: WaterOutlook NPDC

Contact:
Phone:

Sample Description:	
	The BOD dilution water blank a

Test Date	Analysis	Result:
26/10/23	pH	7.2
26/10/23	Suspended Solids	26
26/10/23	BOD_5(Carbonaceous)	10

Understanding the oil interceptor analytical results

Trade Waste Sampling Results (acceptable results?)

Company C

Laboratory Analytical Report

Client: WaterOutlook NPDC

Contact:
Phone:

Sample Description:	

Test Date	Analysis	Result:
30/08/23	pH	7.4
30/08/23	Suspended Solids	1050
30/08/23	BOD_5(Carbonaceous)	100
30/08/23	Oil and Grease	25

Company D

Laboratory Analytical Report

Sample/Report Number:
Report Status:

Client: WaterOutlook NPDC

Sample Type:
Sample Date: 11/04/24 12:35 PM
To 12/04/24 11:01 AM
Sample Flow: 7.99 m^3

Sample Received: 12/04/24 11:39 AM
Results Checked: 17/04/24 1:52 PM
Results KTP Certified: 17/04/24 2:02 PM
Client Sample ID:

Contact:
Phone:

Sample Description:	Sample Comments:

Test Date	Analysis	Result:	Units:	Analyst:	Ana
12/04/24	pH	7.2	pH Units	AW	
15/04/24	Suspended Solids	23	g/m^3	GU	
12/04/24	BOD_5(Carbonaceous)	28	g/m^3 $CBOD_5$	GU	

What Sampling results may indicate

- Company A and C are typical of expected results.

Analysis	Result:
pH	7.5
Suspended Solids	121
BOD_5(Carbonaceous)	52
Oil and Grease	140

A

Analysis	Result:
pH	7.4
Suspended Solids	1050
BOD_5(Carbonaceous)	100
Oil and Grease	25

C

- Company B and D returned values which are very low and could indicate the following:
  - The system is rarely used – no contaminants in the oil interceptor,
  - The interceptor has been recently cleaned – ask for proof of cleanout or check historic sampling results, or
  - The diversion system has failed and generally is stuck on sewer. If possible, test the operation of the system or set up flow monitoring equipment during a wet weather event.

Analysis	Result:
pH	7.2
Suspended Solids	26
BOD_5(Carbonaceous)	10

B

Analysis	Result:
pH	7.2
Suspended Solids	23
BOD_5(Carbonaceous)	28

D

By having a good understanding of what is cleaned on the pad e.g. (heavy equipment) and examining past sampling results it will help to identify if additional investigation is required.

Company B (Equipment Hire Company)

This system was set up using a water blaster for cleaning the diversion system. It is triggered by the pressure switch on the water line (to sewer) and a rain sensor (to Stormwater). A 32mm pipe and hose were added and the water source was changed from potable to captured water.

Sampling results indicated that the oil interceptor was ineffective and the company was issued a notice to undertake the following:

Action

- Meter the roof captured water (modified from town water supply). Potable water use indicated the system was rarely used.
- Fit a counter to their system **(To be discussed after examples)**
- Use a cherry picker to inspect and test the rain sensor (to be videoed and forwarded to Council)

Findings

- The rain sensor had failed sometime back therefore the system was overcome during heavy rain events which led to flushed contaminants to sewer.

Company D (Maintenance of Heavy Machinery)

Their system has a Marley sampling point downstream of the oil interceptor. Using a ISCO sampler, flow module and 150mm flow insert the flow through the system could be recorded over a 24-hour period during a rain event.

During the flow monitoring period the wash pad was not used however during that period the recorded total flow through the interceptor was 7.99m^3.

Findings

- During high rainfall events the flow through the oil interceptor exceeds the hydraulic capacity which flushes contaminants to sewer.

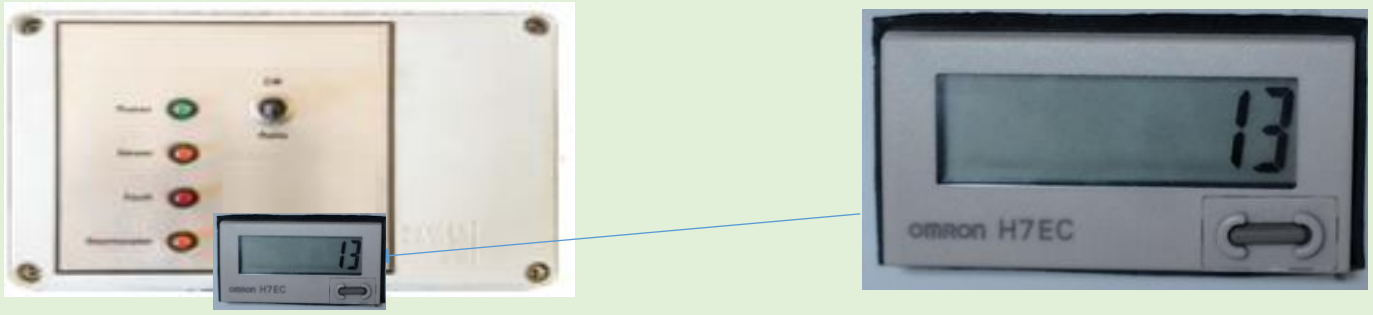
Actions

- The occupier was required to test the system and fit a counter (**Explained in the next slide)**

After which the Council TWO would undertake further flow monitoring to determine if there was an improvement or if there was an issue with the way the system was programmed.

System Inspections and Improvements

- Testing the system requires activating the rain gauge to get the diversion valve to switch from trade waste to stormwater. These sensors are generally at the top of a pole or on a workshop roof hence they aren't easily tested.
- Ideally the discharge line should have a flow meter however the expense to fit one is prohibitive.
- Cost effective solution – **When a new system is installed the occupier is required to fit a non-resettable counter.** This counter will count each time the diversion valve switches to either sewer or stormwater, the occupier is then able to track if the diversion system is switching. Additionally the counter is a check that the rain gauge is functioning correctly.
- To give Council confidence that the system is operational the occupier is required to submit the totalized counter value quarterly, along with the water or effluent meter readings. Council will also record the counter value when sampling or undertaking inspections.



For existing wash pads- In the advent of a non-compliance notice being issued the occupiers will be required to fit a counter as a condition of the non compliance actions.

Summing Up

Unroofed wash pads no longer need to have a bad rap for the following reasons:

1. **With the introduction of the safe valve diversion system the main failure- sticks, stones sand and debris- has been eliminated.**
2. **The introduction of a requirement for a single stage oil interceptor on the stormwater side has allowed easy inspections of the stormwater system.**
3. **The installation of a counter will identify almost all failures.**
4. **The controlling program can be amended** (in the case of safe valve system) to suit Council requirements.
   e.g. Once diversion system has diverted to stormwater, do you want the valve to stay in that position until the pad is next used? or do you want it to cycle back to sewer after 30 minutes after a rain event which markedly increases the volume discharging to sewer? These questions relate back to company D, if after further flow monitoring shows the volume is still high the occupier will be asked to get the program modified.

The safe valve system has been around for many decades where its main use is to divert dairy shed wastewater.

A number of these valves have been installed in North Taranaki over the last 15 years. To date only one valve has failed, and this was caused by a worker nailing items onto a wall. By doing so he put the nail through the diversion systems airline. Fortunately, the fail-safe is set to open.

First Flush System

This design eliminates the need for a rain sensor