Environment Waikato Technical Report 2008/06

Industrial Stormwater Pollution Prevention Programme (ISP^3) Implementation Plan

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Disclaimer

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Executive summary

This document is intended to provide the framework and strategy for a proactive Industrial Stormwater Pollution Prevention Programme (the ISP^3) for the Waikato region.

High levels of contaminants in industrial stormwater runoff, such as heavy metals (zinc, copper and lead) and synthetic organics (oil and other petrochemical derivatives) are well documented in both New Zealand and overseas literature. Environment Waikato (EW) have long been concerned about the potential mixture of chemicals that can be present in poorly managed industrial site stormwater runoff and the potential effects that they can cause on aquatic receiving waterways.

EW like a number of regional councils wish to move from being the "ambulance at the bottom of the cliff" reacting to problems to providing the "safety net at the top of the cliff" preventing problems from even starting. To this end the development of a collaborative ISP^3 in partnership with the region's territorial authorities (TAs) is clearly signalled in the Environment Waikato LTCCP 2006-16. Statutory backing for a programme of this type is also contained in the provisions of the Waikato Regional Policy Statement and the Proposed Waikato Regional Plan.

EW and some of its constituent TAs have opposing views regarding the statutory responsibility for discharges to land from industrial activities that result in contaminants entering public stormwater networks. While the pros and cons of each view are considered, the ISP^3 strategy does not attempt to provide a definitive solution. ISP^3 provides a menu of options for EW, either alone or in partnership with a willing and capable TA, to ensure that industrial site stormwater is being managed appropriately. Regardless of who implements the programme, the intention is that industrial site operators are held accountable for keeping their site stormwater clean. The most efficient and effective approach is to deal with the site operator directly as they are best placed to employ appropriate site management practices to protect stormwater quality.

Ideally a cooperative approach that avoids duplication will be adopted, which ensures that the organisation best paced to formulate and implement the necessary controls takes the lead role. In any event a successful approach will involve both partners in local government, robust and complementary rules at regional and district level and will include a variety of collaborative initiatives.

In order to provide a holistic approach to pollution prevention a menu of programme components has been recommended as follows:

- proactive sector-based site auditing for high-risk industrial sites
- industrial area blitzes for industry clusters and outlying townships
- industry group projects for industrial and domestic activities that cause a significant number of problems.

Each of these approaches has the primary objective of protecting and improving land and water quality from industrial activities through proactive site audits by:

- identifying and stopping any actual pollutant discharges to land or water
- identifying and putting site management controls in place to avoid potential discharges
- ensuring industrial site operators are prepared to deal with accidental discharges through the preparation of emergency spill response plans and staff training.

To be successful any proactive auditing team must be:

- formed with a clear management framework
- adequately resourced to achieve the programme objectives in a realistic timeframe
- focused on proactive industrial site auditing only

- supported by policy that is clear, robust and enforceable
- constituted with experienced and appropriately trained personnel
- supported by clear, concise, practical and pragmatic operational guidelines
- appropriately equipped for auditing (hardware, H&S and IT).

Other regional councils (GWRC, ECan, ARC and others) have invested a significant amount of effort in developing resources that can be taken into the Waikato ISP[3]. The tools and equipment that have been proven effective through trial and error by other regional councils have been ranked for use in the Waikato ISP[3] and are discussed in detail. A ranking process is recommended to establish a prioritised order in which the industrial sectors, industrial areas and/or industrial activities should be proactively approached first. A process for dealing with each industry once it has been prioritised is outlined in detail.

The number of staff resources required will be dictated by the options chosen for inclusion in the programme but as a minimum, four staff including a team leader are recommended. With these resources all high-risk sites can be audited and brought up to a high standard within a five year timeframe.

The pros and cons of a number of different funding options are considered and the approach of using a targeted regional rate on industrial property combined with limited cost recovery is recommended. Based on previous EW experience and proactive pollution programmes elsewhere this combination is considered the most likely to be acceptable to both industry and the community generally. Generally speaking ratepayers want to see the 'polluter pays' principle employed, as they are intolerant of polluters not being required to fund the full cost of their poor environmental practices being remedied.

1 Introduction – ISP^3 purpose and scope

Industrial site stormwater quality has the potential to contain a wide variety of contaminants, including heavy metals (most commonly zinc and copper), synthetic organics (PAH's, and petrochemical constituents – oil, petrol diesel etc), nutrients, sediment, harmful micro-organisms and oxygen demanding substances. The composition of the chemical mixture present in site stormwater runoff will depend on the type of industrial activities being carried out on the site and site management practices.

Photo 1: Stormwater being contaminated from waterblasting a driveway

Photo 2: Contaminants from concrete cutting running into stormwater systems

Photo 3: Release of contaminants to stormwater from a paint spill

Photo 4: Unbunded fuel tank

Photo 5: Sampling blood released to a stormwater system

Major discharges of contaminants into waterways causing significant adverse environmental impacts, such as fish kills, result in well publicised source identification, clean-up and enforcement activities against the site operators by regional councils. Examples are provided in photos 1 to 5 (courtesy of Auckland Regional Council) and their impacts in Photos 6-8.

Photo 6: A duck covered in tar from a contaminant discharge to stormwater

Photo 7: Foam in a stream affected by contaminated stormwater

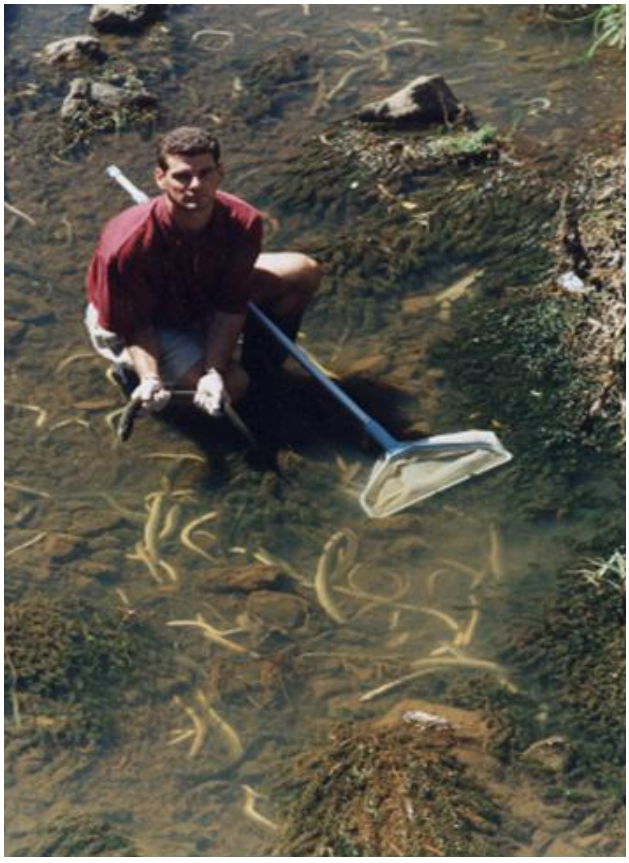

Photo 8: Deed eels in a stream affected by contaminated stormwater

However, these highly visible, environmentally catastrophic events are but the tip of the iceberg in terms of the total loading of contaminants that are mobilised from industrial sites via rainfall runoff. In many instances it is the cumulative effects of multiple small

discharges through the stormwater system that lead to the build up of contaminants to the point that compromises the viability of aquatic receiving environments to sustain robust and diverse biological communities. Examples are shown in Photos 9 through 12.

Photo 9: Paint being cleaned down a stormwater grate

Photo 10: Poor drum storage with ongoing runoff to stormwater

Photo 11: Red fuel oil discharging via stormwater into an estuary

Photo 12a: Dye spilt on a roadway, b: moving into a stormwater grate and c: finding its way into a stream

There is a considerable body of scientific data from New Zealand (such as Williamson's 1993 Urban Runoff Data Handbook) that shows stormwater contamination levels from industrial areas exceed those from residential land by a factor of at least four fold for many key contaminants. For more exotic toxic materials that are primarily related to industrial processes, the differences are much more pronounced. Many industrial activities have signature contaminants which typify that particular industry and allow for chemical fingerprinting of discharges (such as the copper, chromium and arsenic in timber treatment plant runoff). In these circumstances site management practices (source control) and stormwater treatment devices can be tailored to suit the specific requirements of the signature contaminants.

Regardless of the contaminants involved there are a range of simple practical and pragmatic measures that should be employed at any site to reduce stormwater contamination to a practicable minimum. There is considerable debate currently in the Waikato region about who has the responsibility for auditing industrial sites and checking for inappropriate management practices leading to contaminant discharges. The most important point is that somebody does the assessments and advises industry of appropriate practices, as currently discharges are occurring that could easily be avoided.

EW have long been concerned about the impacts of the storage, use, disposal and transportation of hazardous substances. The Waikato Regional Policy Statement (WRPS, excerpts included as Appendix 3) contains policies to guide the region in the management of materials that have the potential to cause significant adverse effect on the environment. The WRPS outlines how EW will work collaboratively with the region's city and district councils to provide guidance and assistance to industry so they can operate in an environmentally sustainable manner.

EW's 2006-2016 Long-Term Council Community Plan contains a group of activities called "Waste, Contaminated Land and Pollution Education" and in particular, a project called "Stormwater Pollution Prevention". This project has the following goal:

"The creation of a regionally consistent, integrated approach to promoting pollution prevention and waste minimisation, that builds on skills and capacity existing in territorial authorities, the Regional Council, DoL and health authorities to maximise efficiencies and economies of scale in service delivery and enforcement."

This project has stated targets relevant to EW and industrial sites.

- *Urban stormwater quality from industrial catchments will be of the same quality as from urban catchments*

- *All high risk industrial sites in urban areas [**will be**] participating in pollution prevention programmes and actively*

- *[**EW**] Will need to work with TA's and central government departments to identify priority industrial sites within each community*

- *A strategy for the delivery of an integrated pollution prevention programme (including funding arrangements) prepared and agreed by the mayoral forum and relevant central government departments by 1 July 2007.*

This report outlines a range of options for Environment Waikato (EW) and the Territorial Local Authorities (TA's) of the Waikato region to undertake a comprehensive Industrial Stormwater Pollution Prevention Programme (ISP^3). The ISP^3 is an action plan with an emphasis on "*doing*" rather than monitoring and/or responding reactively, in that it is about working proactively with industry "on the shop floor" with the primary objective of protecting stormwater quality. To be most effective it is imperative that the programme should be a partnership between local government and industry and it must be based on the premise of '*helping industry out, **not** trying to catch them out*'.

The ISP^3 programme will have the added benefits of:

- educating industry and the general public about stormwater pollution and its effects on the environment
- improving industrial site management practices
- reducing industrial waste discharges
- reducing the adverse impacts of industrial stormwater runoff on water quality and aquatic biota
- reducing the creation further contaminated land
- identifying historical industrial land contamination.

This document presents a series of options for industrial stormwater pollution prevention that can be used collectively as a package or individually as circumstances and resources allow. Ideally the whole package would be used to provide a holistic approach, however, there are significant resource implications for the implementation of such a programme regionally. The statutory agencies involved (EW and TAs) each have a major role to play and a partnership approach is the most likely mechanism for delivering the most effective programme.

The sections of this report are as follows.

- Section 2 outlines the purpose and scope of industrial stormwater contamination issues and pollution prevention programmes.

- Section 3 reviews the range of programme components that have been developed elsewhere in New Zealand that might be used to address contamination issues.

- Section 4 presents the strengths and weaknesses of each approach with particular regard given to the unique circumstances that might influence the approach in the Waikato.

- Section 5 outlines a methodology for prioritising industrial sites, sectors area or catchments and describes a rating system for environmental performance.

- Section 6 details the available tools and programmes that are implemented elsewhere in New Zealand.

- Section 7 considers the resource requirements and impacts on other parts of EW and the TAs operating in partnership.

- Section 8 provides recommendations for a comprehensive ISP[3] programme for the Waikato.

The Appendices contain a large amount of background information and discussion about the statutory management of stormwater discharges. Appendices 2, 3 and 4 include the statutory provisions of the WRPS and Regional Plan and District Plan provisions (using HCC as an example) and the challenges that this might create for proactive auditing personnel.

Hamilton City Council (HCC) appear to be well placed currently to become an ISP[3] project partner for a pilot trial of this approach in that they have:

- a substantial amount of the industrially developed land in the region clustered into several well defined areas
- a good understanding of the industry types in their area on a database
- trade waste and environmental health officers with site auditing experience a good grounding in site management practices and problems
- a significant investment in stormwater infrastructure and they will be the holders of the comprehensive stormwater discharge consent for these industrial catchments
- a willingness to be part of a process that ensures the quality of discharges entering the stormwater system are not compromised by poor site management
- a statutory responsibility for the management of land use under the Resource Management Act (RMA).

2 Background to pollution prevention

The chemical mix that can be present in industrial stormwater runoff has the potential to cause both short-term ‘acute’ and/or long-term ‘chronic’ adverse environmental effects. One of the most difficult to trace and deal with is the cumulative effect that arises from many small and seemingly insignificant discharges that occur every day as a part of industrial site activities. The initial runoff that occurs from hard surfaces when it rains, termed the ‘first flush’ has been found in numerous studies to be the most heavily contaminated as later runoff has lower levels of contaminants to be washed off and there is greater volume for dilution. The types of chemicals concerned are as varied as the industrial activities that lead to stormwater contamination and the methods for dealing with them also vary widely.

Fortunately many of the actions needed to prevent stormwater contamination are relatively simple and practical to implement; however, proactive effort is essential to ensure that industry are educated about appropriate site management activities.

As stated above, the potential effects of stormwater quality from industrial activities has been recognised by the inclusion of a project titled "Stormwater Pollution Prevention" in EW's 2006-2016 Long-Term Council Community Plan. The project description in the report states the following:

"Council currently does nothing to address the potential discharge of hazardous contaminants from industrial sites into urban stormwater. In this we are out of step with all other major RC's. This has been a point of conflict with our TA's for some time."

The ISP[3] strategy is intended to redress this perceived deficiency.

2.1 Philosophy behind urban pollution prevention programmes

In other parts of New Zealand industrial pollution prevention programmes have emerged out of reactive pollution response programmes, such as 24-hour pollution hotlines. Over time, frustration at repeatedly having to educate each individual site owner about similar problems with site management and consequences for stormwater runoff and subsequent water quality impacts has led to the development of proactive initiatives. The most common site management problems encountered on industrial sites are detailed in Appendix 11, but can be summarised as follows.

- Washing of raw materials, products, equipment or vehicles in a location that leads to washwater containing cleaning chemicals, contaminants from the outside and/or storage areas inside vehicles and residues of the materials being transported, being washed onto the ground and into stormwater systems.

- Poor handling, storage or use of environmentally hazardous substances leading to spillages where they can flow or are washed onto or into the ground or to a formed stormwater system.

- Lack of preparedness for dealing with spillages resulting in risks to staff, customers and the environment.

Proactive initiatives have largely sought to move the regulator, industry and the community away from the '***ambulance-at-the-bottom-of-the-cliff***' mentality and more toward a '***prevention-is-better-than-cure***' approach. Rather than having industrial site operators that are unaware that their actions are causing (or have the potential to cause) adverse environmental impacts, EW is seeking to move them toward operating in an environmentally sensible manner automatically without having to think about the right steps to take.

It is important to ensure that focussing on adverse effects does not lead down the path of an '***all industry creates bad effects***' mentality without considering the balance between economic and social needs that are fulfilled by employment and the creation of consumer goods. All land uses create some effect on the environment and this project is about the promotion of simple, practical and achievable site management practices that are good for business and that limit adverse environmental effects to a level the community finds acceptable.

2.1.1 Sustainable management – it is just good business practice

Sustainable management is a concept that has gained a significant amount of leverage at a central and local government level in recent times. Changes to the Local Government Act in 2005 have strengthened the need for local government to be more

aware of the consequences of management approaches on social, cultural, economic and environmental wellbeing. While this change has been seen in some circles as providing a barrier to growth and change it can also be viewed as providing a platform for consideration of pragmatic and practical solutions to management problems, particularly regarding the costs of implementing controls versus the benefits.

To a large degree site stormwater protection is common sense. If contaminants get onto hard surfaces or soil that are exposed to the weather and they don't get cleaned-up then they will wash-off next time it rains and then get into a drainage system leading to a waterway or into groundwater. Somewhat surprisingly, formed drainage systems aren't generally well understood by many industrial site operators; basically it is "out-of-sight, out-of-mind". This problem is compounded by a misconception that all piped systems go to a treatment facility of some description. So a fundamental hurdle in approaching site operators is the understanding of connectedness between activities on their sites and impacts on streams and what lives in them.

Even where site operators (or members of the community) understand where piped system go there a lot of popular misconceptions about what lives in the waterway and what effect the contaminants in the wastewater will have. These common urban pollution myths and the facts about why the common perception is wrong are described as follows:

Myth #1: "But it is only a little bit"

Often people feel relaxed about discharging small amounts of materials onto industrial site surfaces because individually doesn't amount to very much, however the following must be taken into account.

- Small amounts are much easier to prevent escaping in the first place, or clean up if they have been spilled.

- Appropriate clean-up and prevention of further spills is much better for worker safety and can saves money on lost product or materials.

- Depending on the material, in some cases even small amounts can have drastic consequences and cost a lot to clean up (e.g. 4 litres of oil costs around $500-1000 to clean up once it reaches a stream).

- There are lots of other small amounts being washed off other sites which collectively cause adverse environmental effects in water bodies.

- In summer, low flow periods many streams do not have sufficient flow in them to assimilate even small amounts of waste material.

Myth #2: "Everyone else is doing the same thing"

Sometimes the fact that other operators are also using poor site management practices makes some industrial site operators complacent about poor management practices, however the following must be taken into account.

- Industry practices are often intergenerational and we have learned poor practices; however, this doesn't make them acceptable or even sensible in some cases.

- EW is working with industrial sectors and/or in industrial areas to ensure that all site operators are working in a sustainable manner.

- Many people making the same mistake doesn't make it right or lessen the effect on the environment.

Myth #3: "I've been doing this for years"

A history of operating in a particular way can make operators complacent, even when shown to lead to pollution, especially where they have not been advised of an appropriate alternative, however the following must be taken into account.

- Actions that cause pollution whether knowingly or unknowingly are no less harmful on the environment.

- Collectively the loss of materials over an extended period can add up to a considerable amount of money.

- Exposure of staff to materials, including waste products, is bad for health and safety.

- Not being caught polluting previously should not be an excuse for being allowed to continue.

- Practice of the day changes as we become more enlightened about the effects of our actions, both individually and collectively, on the environment, therefore an approach that was accepted 30 years ago, today is not.

Myth #4: "It is biodegradable"

Many products (especially cleaning fluids) are sold and bought because of the 'green' tag of biodegradability, many operators believe that this will enable them to discharge the resulting wastewater without harm; however, the following must also be considered.

- Biodegradability simply means that the material will break-down to a more stable (but sometimes still toxic) form, usually by the action of bacteria. This process uses up oxygen from the water meaning there is less available for the creatures that live there.

- The things that the waste breaks down to can combine with other chemicals in the waterway to cause an adverse effect.

- Where cleaning materials are involved they are used to mobilise other contaminants which can also have a toxic effect.

- Cleaning materials are designed to kill things (if they didn't we wouldn't use them) and will often still have some residual effect before they break-down to more benign constituents in receiving water bodies.

Myth #5: "That drain goes to a treatment plant somewhere"

Since both pipe networks are underground and in some older parts of cities were often deliberately combined together historically (combined stormwater/sewer networks) many people are confused about which is which, however the following must be taken into account.

- As a rough rule of thumb, outside drains (except for gully-traps) are for stormwater only, unless a formal trade waste connection has been approved buy the sewage network utility operator.

- Few stormwater systems have treatment systems (such as ponds, wetlands or sand filters) that can be relied upon for treatment of waste materials.

- Stormwater systems connected to wastewater treatment plants are also problematic as they overload the system with large volumes of stormwater every time it rains, causing system failures and leading to sewage discharges to waterways. For example a 20mm rainfall event on to 100m^2 of asphalt results in 20,000 litres of runoff entering the sewerage system which is the equivalent of the daily effluent produced by around 130 people.

- Knowledge of where the drainage network actually flows, both on a specific site and through a pipe network may be critical if a major spill event occurs, to isolate the site to prevent discharge to a water body and/or limit the area of damage if the material does leave the site.

Myth #6: "Nothing lives in that grotty little drain anyway"

Communities become desensitised to pollution if it continues to occur in a waterway for long enough and nothing seems to be done to fix it. Once a mind-set develops that a waterway is always polluted it becomes easier to be careless about site runoff contributing to the contamination, and more reluctant to effect changes that will contribute to improvement of water quality; however the following must be taken into account.

- Regardless of what it has become, all waterways have the potential to be protected and enhanced; however, this will not occur until attitudes in the contributing catchment change.

- Even polluted waterways can support a surprising amount of stream life, although mainly limited to hardier pollution tolerant species, and as such they deserve our efforts for restoration.

- That "grotty little drain" leads to a larger stream and then river system and ultimately to the sea, so pollution can have far reaching effects on streams, rivers, estuaries, harbours or beaches (depending where you live).

- Nature can redress years of waterway abuse in a few short months once the pollution source is stopped. Contaminants in the water are rapidly flushed away and even contaminated sediments will be shunted through the system with future flood flow events. Aquatic life will return as soon as the ecosystem is capable of supporting them, so once aquatic plants are established (if they weren't already there) insect larvae rapidly recolonise over a period of months and eventually some fish life that migrate into streams from the sea will move in to take up the available habitat.

Myth #7: "Where are all the dead bodies?"

For a lot of people the only evidence that will convince them that a problem exists is the proof that something has been killed; however the following must be taken into account.

- The death of many smaller organisms, such as algae and insect larvae would not be obvious to most people; however, the removal of a food source will result in higher organisms being forced to move elsewhere if they are able or starve.

- Sub-lethal impacts can be just as devastating to the structure of an aquatic community as acute toxicity. For example the removal of habitat by smothering with sediment means that stream life either moves away if it can or does not become established in the first place, either circumstance has the same effect as a toxic event, the organism is no longer present in the affected part of the stream until the habitat is restored.

- Cumulative impacts of a lot of small waste discharges, or wastes combining synergistically to create a greater effect, can still cause toxicity particularly over a long period of time. Such effects are unlikely to be as obvious as a sudden fish kill.

- Bioaccumulation of contaminants in the flesh of aquatic life can lead to reduced viability (hardiness) and ability to reproduce (fecundity) and/or contaminants being passed up the food chain.

Historically a punitive and reactive approach of using enforcement measures to achieve change has been used. This approach has been effective with individuals companies; however, such an approach is unlikely to be successful at effecting lasting change as changes are made because the council has forced them to occur rather than by voluntary change. Work with individual companies will have some effect across and industry sector via word-of-mouth but change is unlikely to be consistently applied or to a high standard.

Proactive initiatives are frequently underpinned by "do-it-yourself" tools to assist operators clean up their act and those documents and approaches used in Canterbury, Wellington and Auckland are discussed later in this report. However, the right approach to encourage industry to effect changes is sometimes difficult to determine.

The ARC has undertaken a proactive auditing programme in one form or other since the late 1980's with a specific team and strategy in place since the late 1990's.In 2004/05 the ARC in collaboration with Landcare Research undertook a research project to determine via industry interviews and questionnaires, the most effective approach for proactive industrial pollution initiatives. 158 industrial sites, with an equal balance of light, medium and heavy industry that had been through the ARC's proactive and reactive pollution control auditing programme were interviewed, revealing some surprising insights and inconsistencies.

- Proactive environmental improvements were generally internally driven by overseas owners or the ethics of local owners or management.

- Companies linked to exporting were more interested in environmental credentials.

- Few companies received regular enquiries about product environmental specifications.

- Some companies were proud of improving their environmental performance and wanted to gain recognition for this work.

- Costs and liability were important but were rarely rated above customers, local community and employees in importance.

- Compliance was important to companies that had experienced enforcement action and complaints.

- External encouragement without statutory pressure was unlikely to result in improved practices.

- Smaller companies generally did not seek advice outside their business associates.

One of the central findings from all programmes reviewed was how essential it is to ***raise awareness*** *and* ***change behaviour***. Without behavioural change experience has shown that old habits are quickly resumed once council staff are no longer regularly scrutinising a site. Ideally a relationship with enduring value is needed between the industry and statutory agencies and there are a number of options, both regulatory and non-regulatory, by which this can be achieved. The conceptual stages

in behaviour change associated with increased awareness of the issues are shown in Figure 1.

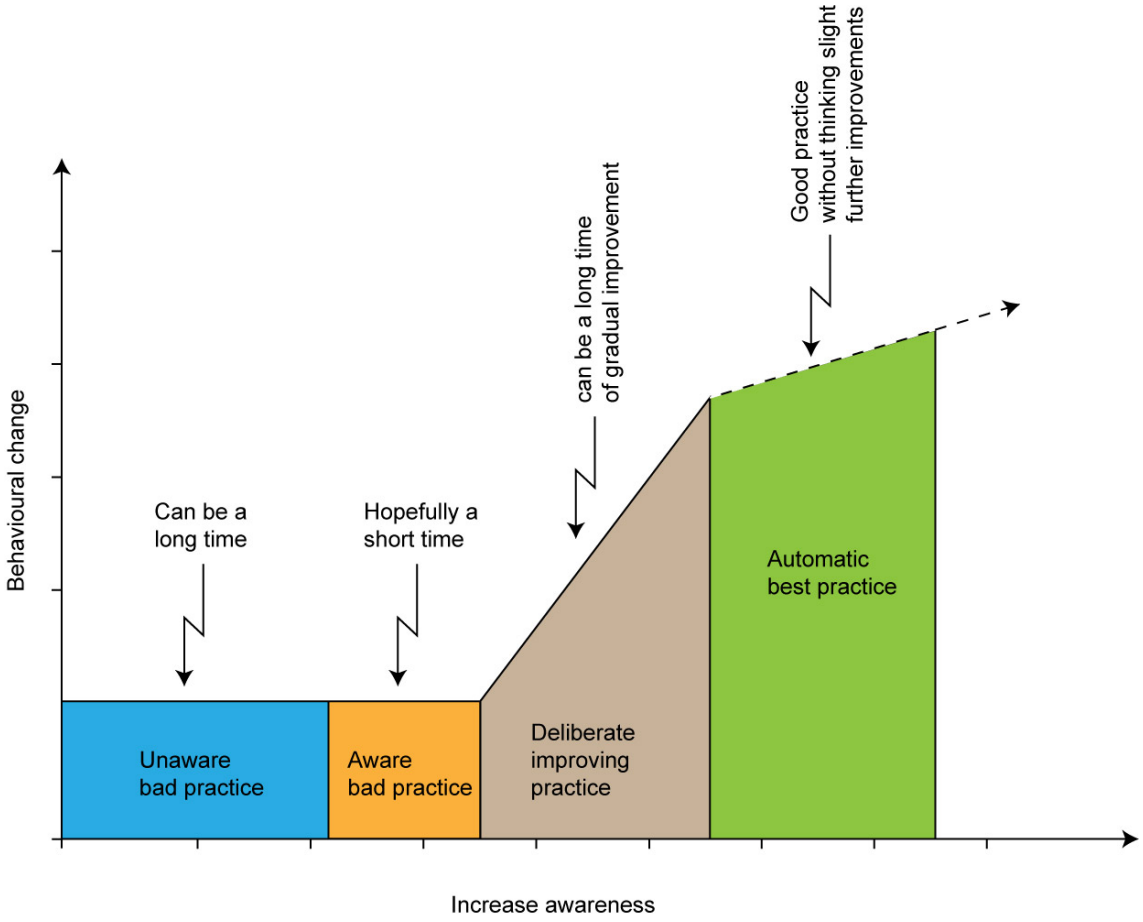

Figure 1: Raise awareness and change behaviour

2.1.2 Industrial site stormwater quality

EW has been concerned for a number of years about the quality of point source and non-point source discharges from industrial sites within the region. Both types of discharges, depending on the chemicals involved, can each lead to acute toxicity in receiving waterways. However, more commonly it is the collective effects of multiple small discharges that result in the degradation of receiving waters, particularly "cumulative" effects over time.

Data from a number of New Zealand studies, particularly those conducted by NIWA (Williamson et al.) from the mid-1980's onward have confirmed the information found in overseas studies (e.g. those published by the USEPA) also holds true for New Zealand. Generally stormwater discharge quality is highly variable mainly driven by the contributing land uses and is toward the lower end of the range found in overseas literature for urbanised areas. As a general rule the concentration of trace metals and synthetic organic chemicals, from least to most contaminated, follow the gradient:

Bush <Rural <Residential <Commercial <Industrial

In areas of concentrated industrial development the small contributions from a large number of sites can result in poor discharge water quality, particularly during the "first-flush" of a rainfall event. The "first flush" is where most of the pollutants from hard surfaces and those trapped within the stormwater infrastructure, such as catch pits, are mobilised. Numerous studies have shown that runoff in the latter part of prolonged rainfall events is relatively clean.

The worst case runoff scenario is where the rainfall runoff event is sufficient to mobilise pollutants but not sufficient to provide very much increase in flow in the waterway to provide dilution. A typical rainfall event leading to runoff from a sealed surface is around 2 mm and rainfall events of this size and greater occur many times annually in the Waikato. Effects are most acute in summer when rainfall occurs after extended dry periods onto heated surfaces such as asphalt. In these circumstances the negative effects on aquatic life in receiving water bodies can occur from both greatly heated runoff absorbing heat from the hard surface, hydrological effects like scouring, sediment deposition and smothering and the toxins that are washed off industrial sites.

The accumulation of contaminants in sediments can be predicted from studies undertaken in other jurisdictions; however, there should be some verification by sampling will ensure that Waikato approaches to industrial site management follow the same pattern as survey data from elsewhere. Work commissioned by Hamilton City Council on stormwater contaminant loads and their effects on the Waikato River (NIWA 2001) confirmed the following contaminant loading pattern in Hamilton:

Mature residential <New residential <Industrial = Commercial (CBD)

This study confirmed that levels of contaminants in water and sediments mirrored those found for other mixed land use catchments elsewhere in New Zealand, with both zinc and copper present at elevated levels. During early May 2007 samples of water and sediment from the Waitawhiriwhiri Stream were analysed for a wide range of trace metal and synthetic organic contaminants. Preliminary results form this survey indicate that zinc, copper and mercury are significantly elevated within the stream water and/or sediment. One site adjacent to the industrial part of the catchment also showed elevated levels of hydrocarbons consistent with petrochemical or industrial solvent materials being discharged into the stream (Nick Kim, Environment Waikato, pers. comm. 2008)

2.1.3 Discharges to stormwater infrastructure - statutory management

The authorisation and management of industrial site stormwater discharges in the Waikato currently falls into two jurisdictions, depending on whether the discharge is into municipal stormwater infrastructure operated by the Territorial Local Authority or directly to a waterway through a private stormwater system. There has been considerable debate between local councils and EW about jurisdiction and responsibility regarding the management of discharges by the operators of industrial sites that end up entering the public stormwater system and ultimately natural stream systems. This report is not intended to try and resolve this issue. However, it does provide a way forward for the statutory agencies involved, to individually or collectively implement practical pollution prevention measures at an individual site, industrial sector, industrial area, or target catchment level.

In the built-up urbanised parts of the Waikato region TA stormwater infrastructure has historically been provided largely to ensure that flooding and erosion from urbanised land was appropriately managed. EW is going through the process of issuing comprehensive stormwater discharge consents on a catchment or sub-catchment basis to the relevant TA to authorise these discharges via ‘comprehensive’ consents. Conditions of these consents specify a certain quality of discharge and the TA is expected to undertake the necessary compliance work to ensure that quality is maintained. Where discharges occur to the wider aquatic environment directly without entering the public system a stormwater discharge consent is issued to directly to the industrial site operator concerned by EW.

Generally the infrastructure servicing an individual site was installed by the developer urbanising the land, as a requirement of land use consent. The expectation has been that the TA will then take over the responsibility and ownership of this system, in some instances with little involvement in what was being implemented and what the ongoing

asset management costs might be. With greater understanding of stormwater contamination causes and effects, management practices previously considered 'best practice', such as pond and wetland systems, have now been shown to be less effective than previously thought. In any event, in our urban "built" environment retrofitting of whole of catchment, or area specific, treatment devices is often not only impractical due to lack of suitable space but extremely expensive, of limited environmental benefit and questionable value for ratepayer investment. Therefore, it is little wonder that environmental management agencies are turning to source control as a practicable alternative.

In industrial and commercial areas an added complication for system designers and statutory agencies alike, is the lack of advanced knowledge about what type of industry was proposed, giving little opportunity for an industry specific treatment device. The degree to which small to medium sized businesses either cease trading (most last for 3-5 years on average according to Auckland business surveys) or relocate, adds a further dimension of difficulty in terms of stormwater quality management. New industrial or commercial activities can start operating in an industrial area provided they meet TA land use requirements without regard being given to the need for stormwater protection. Unless the District Plan has specific provisions regarding site management practices it is difficult to require actions until an actual discharge from the site has been identified in contravention of the stormwater discharge consent issued to the TA.

The change in business type creates a major problem for authorities trying to provide area or catchment stormwater treatment devices because the target in terms of required treatment continues to change. It also creates significant problems for agencies attempting to ensure compliance with stormwater discharge criteria as they need to be specific to the type of industry and signature contaminants that each produces. A change in industrial or commercial activity type can result in a site with substantially different needs in terms of source control requirements and a stormwater treatment device. This creates a major difficulty for the TA in terms of requiring treatment of runoff prior to accepting the responsibility for the infrastructure particularly where the land use proposed for the site is a Permitted Activity under the District Plan.

Managing discharges by an industrial site operator into the municipal stormwater infrastructure, in the absence of specific rules in a Plan, a resource consent, or other statutory means, is complicated. Historically this division of responsibility has led to friction between the territorial authority and regional council in a number of jurisdictions around New Zealand. An evaluation of the statutory provisions of the RMA and relating this to stormwater management roles and responsibilities is provided in Appendix 2. An evaluation of the statutory provisions of the EW's Regional Policy Statement (WRPS) and Proposed Regional Plan (PWRP) is provided in Appendix 3.

It may be that the agency best placed to take enforcement action under the RMA is the regional council through the use of Section 15(1) (b) "*contaminants onto land in a position where they may get into water*" or 15(1) (d) "*contaminants onto land from an industrial or trade process*". However, experience by TA's elsewhere, such as Rotorua District and North Shore City in Auckland, indicates that they can successfully run urban pollution response and proactive programmes, especially where there is a collaborative approach taken with the regional council. Greater Wellington Regional Council and Hutt City Council have recently launched a joint initiative involving a one year trial transfer of enforcement functions for industrial site discharges into stormwater systems. Greater detail on this initiative is provided in Section 3.3.4; it may also provide a useful tool for any collaborative partnership established in the Waikato.

2.1.4 Non-regulatory approaches

As discussed above site management practices are critical to ensuring that pollutants are managed "at source" prior to them escaping into the environment. It is much easier, cheaper and practicable to prevent problems from occurring in the first place rather than trying to remedy or mitigate effects once they have occurred. Many

Regional councils around NZ are seeking to change the paradigm of pollution management to prevention via source control rather than solely relying upon pollution response. Experience elsewhere in NZ has shown that industrial sites adopting good site management practices will reap the rewards in the general operation of their business as well, often saving significant amounts of money on wasted materials or improving productivity and worker safety.

Unfortunately proactive initiatives providing for control “at-source” are often seen as a silver bullet to cure industrial stormwater contamination problems. In particular voluntary accords, codes of practice and best practice guides are often touted as the solution. There is no doubt that they can be a practical way forward; however, such approaches are seldom successful without an environmental bottom line that is maintained by the use of compliance assessments. There are few examples of industry led initiatives in self regulation in New Zealand although this practice does occur overseas (such as the USA). For industry auditing programmes to have community credibility the (local or regional) regulator must be responsible for undertaking quality control auditing of industry self-assessments.

Pollution prevention versus cleaner production

It is important to ensure that pollution prevention (PP) initiatives do not get captured by wider cleaner production (CP) programmes. While in concept one would expect PP measures to be an essential first requirement of any industry CP assessment, in practice they seldom are. In the authors experience at the ARC, the CP section sought to identify and implement more holistic changes to business operations, such as reducing water and energy use and minimising waste production but avoided the obvious but more contentious pollution prevention message. This was explained as avoiding conflict with the industrial site operator over stormwater pollution non-compliance as forcing remedial action would be contrary to the principles of a CP initiative and would be unpalatable to the site operators.

A central tenant of any PP programme must first and foremost be statutory compliance with any relevant resource consent conditions, regional or district plan requirements and the RMA. Any problems identified must be followed by stepwise improvement in site management as shown in Figure 2 below. While information, advice and encouragement are the hallmarks of any successful programme this must be underpinned by a requirement to comply where actual or potential pollution problems are identified.

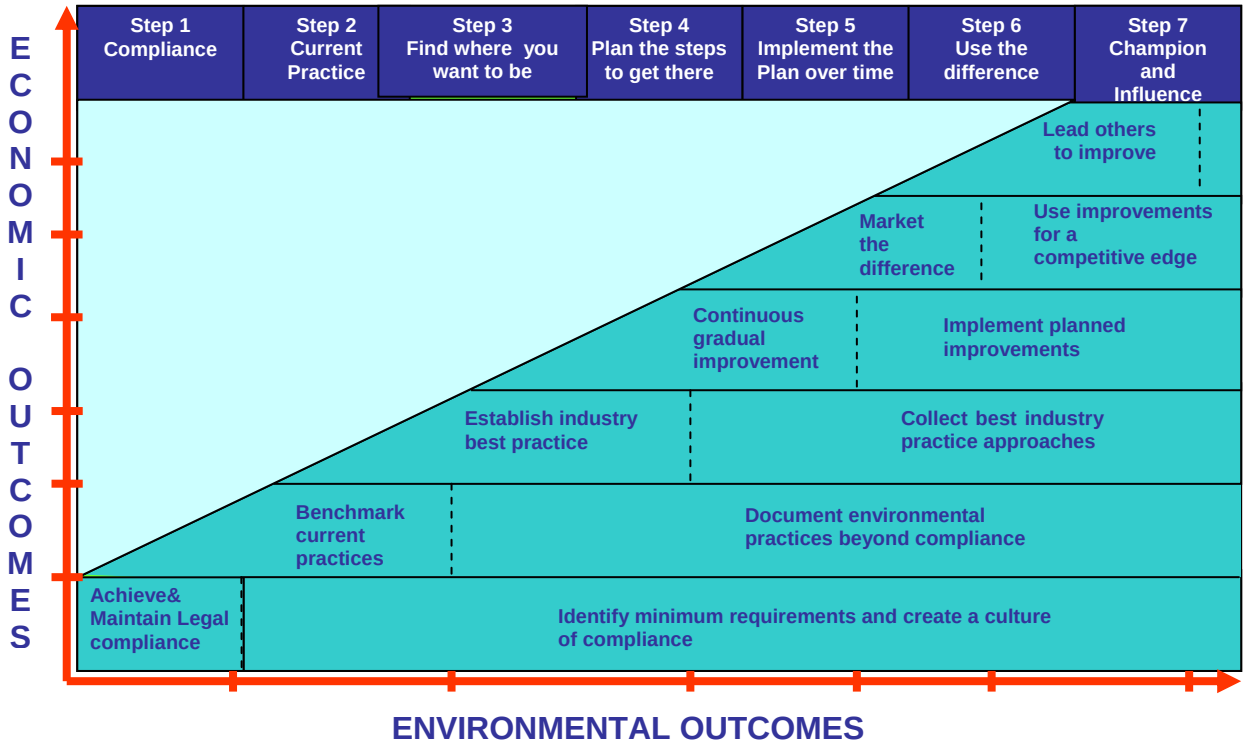

Figure 2: Steps toward business sustainability and the synergies between environment and economic outcomes.

Therefore, while "Pollution Prevention" and "Cleaner Production" are inextricably linked they are best run separately, aligned in terms of industries and supporting each other rather than as one programme. The skill sets required of site assessors and the way information is provided are generally very different. While CP advises and encourages operators to change their operating habits, PP tends to take a more firm, directive approach. Industry can choose whether they embrace CP opportunities or not and statutory agencies cannot make them, whereas PP provides a range of options; however, industry doing nothing is not one of them.

2.1.5 Community expectations

Community expectations regarding water quality elsewhere in NZ indicates low tolerance of business that pollute where simple practicable alternatives to stormwater contamination exist. Polls of ratepayers in Auckland have revealed that where an industry had been previously educated about a problem or that general knowledge meant they should have known, there was a very low tolerance of environmental non-compliance. Recent experience with non-compliance problems with dairy discharges would tend to support a similar view being held in the Waikato.

The extent to which members of the community care about their environment and are prepared to put significant effort into water quality protection is shown by the success of community care projects. Both overseas (Streamwatch in Australia and Adopt-a-stream in the USA) and home-grown (Stream Sense in the Waikato and Wai Care in Auckland) community programmes are successful in educating the community and businesses about the importance of protecting and enhancing local streams and water quality. In Hamilton there is increasing interest in the urban streams both in terms of environmental enhancement and research given there are over 120 km of streams that flow through vegetated gullies of Hamilton City into the Waikato River. Environment Waikato has worked with National Institute of Water and Atmospheric Research (NIWA) to document some of the aquatic insect biodiversity values associated with these habitats and with the New Zealand Landcare Trust to gauge the perceptions towards urban streams of City residents living next to gullies or parks (Peters 2008[1]). Amongst the findings reported from this survey are:

[1] Peters, M. (2008) Urban waterways. Survey of Hamilton residents. June 2008. NZ Landcare Trust, Hamilton.

- most respondents appeared to recognise that stormwater from roads etc ends up in streams
- most respondents recognised that the city's waterways are important for native fish;
- many respondents agreed about the need for habitat in waterways and that culverts and pipes can hinder native fish, although one-quarter weren't aware of this
- almost all respondents agreed that planting stream banks benefits overall stream health.

Just as in other areas, it is anticipated that once educated about the causes of stormwater problems the Hamilton community is likely to become much less tolerant of sites stormwater non-compliance and want to see action taken against non-compliant operators.

2.1.6 Impacts on other programmes

While proactive urban pollution prevention makes good sense, as discussed in previous sections, it is essential that the potential impacts on other programmes, both at EW and TAs are considered and accounted for when deciding whether to proceed or what programme options to commence and how quickly.

2.1.6.1 Environment Waikato

The assessment of industrial sites via an ISP[3] programme has the potential to create a consenting workload, and subsequent compliance workload for EW. Under the rules of the Proposed Waikato Regional Plan (PWRP), a consent is required from EW where an industrial site stormwater discharge occur directly to land or to water without entering a municipal drainage system, unless the discharge meets the requirements of Permitted Activity Rule 3.5.11.4. While the majority of industrial sites will be in reticulated urban areas a significant workload could still result in rural townships.

The extent to which discharges from industrial sites that enter municipal systems may require consents will depend on the approach taken by the TA. Where the TA is prepared to accept the responsibility of managing the polluting activities of an industrial site operator via a comprehensive catchment stormwater consent, no further individual consent is required from EW.

Where the TA does not accept responsibility for the discharge of contaminants onto land at industrial sites where it may get into water via the municipal drainage infrastructure, a much greater consenting workload could arise for EW. In the Auckland situation, for example, around 3,000 high risk industrial sites will require Industrial or Trade discharge consents, with a further 20,000 low risk and 7,000 moderate risk sites managed via PA rule provisions. While the numbers would be smaller in the Waikato it is still estimated that around 500 sites would require consenting by EW if the TA does not accept responsibility via a comprehensive consent.

Contaminated land problems are also frequently discovered as part of proactive ISP[3] programmes particularly where high risk industrial sectors are targeted for assessment. The presence of contaminants in, or on, the land resulting in discharges to stormwater or groundwater can involve a significant amount of officer time in liaison with site owners/operators to determine appropriate management actions. Using Auckland as an example, 100% of the timber preservations sites proactively audited required a contaminated land investigation to be carried out. For electroplating sites more than 80% (n=63) required further investigative and/or clean-up work. Where the contamination is severe and there is contaminant migration off-site, a discharge consent may be required from EW.

On the positive side the ISP[3] programme will assist EW in meeting its obligations under the 2005 RMA amendment 'to identify contaminated land' – see section 2.1.6.3. Most other jurisdictions are currently only undertaking desktop investigations to compile registers of potentially contaminated land based upon the MfE Hazardous Activities and Industries List (HAIL) land use categories. Appendix 1 shows a strong correlation

between industries that are a high risk of stormwater contamination and those that have historically resulted in contaminated sites.

Enforcement results occasionally from proactive assessments, although as stated earlier the main thrust of the programme is to "Help them out – not catch them out". It is important to remember that there occasionally EW will come across poor operators who will not respond to the advice offered and will continue to manage their sites in a way that leads to pollution regardless of the council's good advice. In such circumstances enforcement as a final step will help confirm the message that EW is serious about pollution prevention. This approach also supports and reinforces the efforts of good operators and helps create the even playing-field for business.

EW's communications and education departments will also be an essential part of any campaign, in terms of the joint development of appropriate fact sheets, educational material, media liaison and the like with the TAs.

2.1.6.2 Territorial local authorities

Where industrial sites audited as part of the proactive ISP[3] are found to be polluting there may be a significant compliance/enforcement workload for the TA. Any site that is being inappropriately managed may be failing to meet the Permitted Activity land use provisions of the District Plan. Where the District Plan provisions are not couched in a way that provides for site stormwater protection the underlying provisions of the RMA (S15 &S17) may need to be employed.

Trade waste consents may be one mechanism for ensuring that wastewater from activities such as vehicle, goods or equipment washing that are contaminating stormwater, are directed to the sanitary sewer. For example the Hamilton City Council trade waste department is currently running a project with car and truck washing operations to attempt to get vehicle wash water connected to the sewer. The survey undertaken showed that less than 20% of the vehicle washing operations assessed was correctly plumbed to the sewer, which means the rest were discharging via the stormwater network into waterways. In the absence of specific District Plan provisions HCC officers felt ham-strung in their attempts to make recalcitrant operators operate properly.

Most TAs have some form of waste minimisation strategy as part of their responsibilities under the RMA and LGA. The proactive auditing of industrial sites is an ideal opportunity to provide information about the other waste reduction activities (cleaner production) that can be undertaken on a site in addition to stormwater protection. The 'hook' for industry is the opportunity to offset the costs of site management improvement with the savings that can result from cleaner production techniques.

Like EW, TA communications and/or education staff will also be an essential part of any campaign, in terms of the joint development of appropriate fact sheets, educational material, media liaison and the like.

2.1.6.3 Contaminated land programme synergy

Changes to the RMA as part of the 2005 amendment clarified local government responsibilities regarding contaminated land management. Regional council functions were amended by the addition of S30(1) to section c*: "the investigation of land for the purposes of identifying and monitoring of contaminated land". S31(b) subparagraph* (ii) was also amended to add "*the prevention or mitigation of any adverse effects of the development, subdivision, or use of contaminated land".*

Industrial sites that have poor management practices for their storage, transport, use or disposal of environmentally hazardous substances have a high potential to become contaminated sites. Spillages and leaking storage vessels in particular can lead to soakage into unsealed site surfaces or under sealed surfaces via cracks or gaps.

Appendix 4 contains the relevant WRPS and PWRP provisions relating to contaminated land management. The Issues, Objectives, Policies and Implementation Methods of the stormwater and contaminated land sections are complementary to each other. Of particular relevance to the ISP^3 programme are WRPS Issue 5.3.1 and Objective 5.3.2 which link closely with proactive industrial site inspection and the prevention of stormwater contamination as the causes are common to both problems.

The proactive assessment of high risk industrial sites has proven effective for the ARC in identifying contaminated sites (confirming the risk status conferred by the High Risk HAIL land use categories). Experienced officer observations during site audits, questions about site spill history and sampling site soils and/or stormwater catch-pit contents, are all effective techniques in determining a site's contamination status.

Site stormwater catch-pit sediments in particular can be used as an integrator of a site's contamination problems, especially when the catch-pits are cleaned out infrequently. An example of this technique being successfully employed can be found in several university studies part funded by the ARC. The first was a MSc Thesis by Marty White in the late 1990's which investigated treated timber storage yards. This work clearly showed that sediments contaminated with CCA that had leached from stacks of treated timber had been mobilised by stormwater and had accumulated in the site stormwater catch-pits. Similarly an Auckland University Environmental Science Post Graduate Diploma Dissertation by Wesley Smith in 2001 assessed all the region's electroplating operations. This study linked site management activities with the accumulation of heavy metals such as zinc, nickel and chromium in site stormwater catch-pit sediments.

More recently the ARC has embarked on sector-based high risk industrial site assessment via its industrial pollution prevention programme that has resulted in high proportions of sites showing contamination levels that require further assessment and remediation. For example 100% of both timber treatment sites, and metal recycling and electroplating sites with unsealed areas, were found to be contaminated via proactive site assessment.

While desktop exercises to identify potentially contaminated sites using MFE's HAIL list will give an indication of the number of sites, the only way to convert this into a real number is via a site assessment which the ISP^3 can fulfil. The ISP^3 programme's focus on pollution prevention will also ensure that sites are less likely to become contaminated in the future.

The PWRP Policies and Implementation Methods in tandem with those relating to stormwater management provide a strong platform for an ISP^3 programme that:

- Focuses on current industrial activities;
- Targets the highest risk industries in terms of pollution potential;
- Focuses on highly toxic substances;
- Considers pathways for offsite migration of contaminants via stormwater or groundwater; and
- Uses environmental receptor sensitivity as a final filter for determining auditing priority.

2.2 ISP^3 programme design

Successful pollution prevention programmes overseas and in NZ have some common overarching features, including:

- strong regional leadership
- a clear direction and supporting framework
- robust planning policy (regional and local) underpinning initiatives
- implementation by skilled practitioners
- supportive statutory and community partners
- clear, concise, practical and pragmatic operational guidelines

- sustained stakeholder buy-in.

It is essential that each of these important operational requirements of the programme are properly scoped and developed in consideration of local constraints. Chapter 3 examines successful programme components from elsewhere around NZ to provide a menu of options for consideration in the Waikato.

In terms of the overarching features of successful programmes, Figure 1 below shows the 5 key work-streams that emerge from these fundamental requirements and each of these work streams is explored in greater detail in the following section.

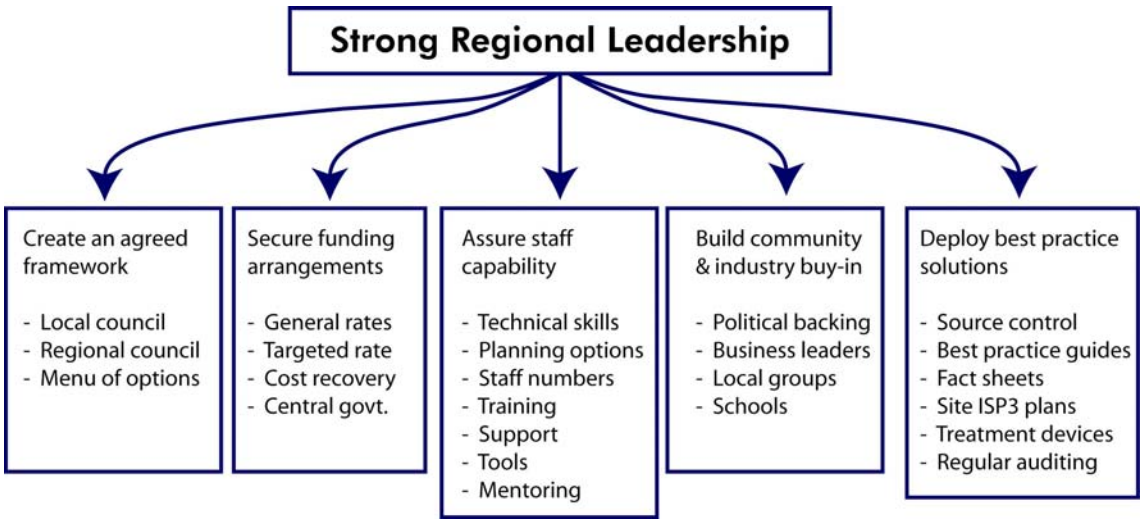

Figure 3: Essential components of a successful ISP[3]

2.2.1 Create an agreed framework

The later sections of this report are intended to provide a menu of options for the delivery of an ISP[3] that can be used separately or collectively. It is very much a "horses-for-courses" situation and flexibility for programme partners is very important to ensuring success. The development of a robust programme framework is an important first step which clearly articulates a project plan once the programme components are chosen.

A clear governance structure is required as part of the framework to ensure that progress is tracked, reported and supported by senior management and political representatives. A simple generic example of a governance structure is shown below; however, this is indicative only and should be developed with stakeholders to best fit each situation. The political interface is important to ensure that the project gets support from elected members. Likewise a senior management steering group is essential to make sure that programme decisions are going to be supported at both the Regional and City or District level.

Experience from the ARC situation leads me to recommend that the project leader role is a stand-alone position, not an adjunct to an existing role. It is possible for this position and the proactive team members involved to work as external contract positions. However, there are some potential issues regarding entry to sites and any follow-up enforcement activities if external contractors are used. The structure of the project team, membership and suggested mode of operation is discussed in detail in the section on assuring capability below.

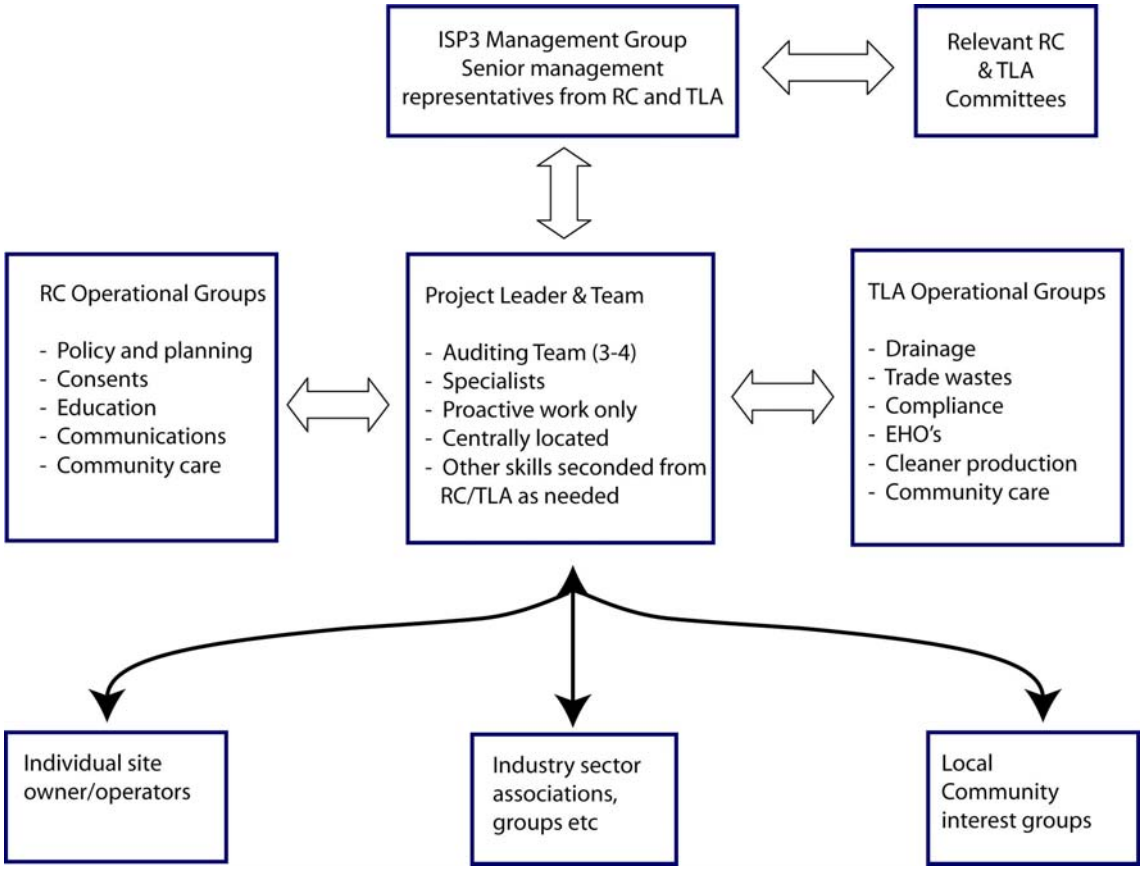

Figure 4: Generic governance structure

Determination of which functional groups are involved is a key to ensuring that everyone knows what is going on and the part they are expected to play. Key people should be chosen within each operational group to ensure that when resources need to be brought together to undertake collaborative auditing actions with industrial sectors or in industrial areas, they are supported and integrated so it is essential that these people are committed to the programme success. The key contacts within each operational area will be responsible for dissemination of information to their staff and obtaining the necessary information or resources for the Project Leader to deliver the project.

2.2.2 Secure funding arrangements

As with all projects the ISP^3 can only operate properly if appropriate levels of resources (people, equipment etc) are secured. Initially at least the most important step is securing funding. There are a number of funding options which could be considered for this project which can be used individually or collectively. A simplistic pros and cons analysis for the options is provided below. For each of the options a 5 star rating has been applied based upon the following factors:

- fairness and equity to ratepayer sectors
- practicability of implementation (coverage of costs and ease)
- exacerbators/beneficiaries major contributors
- consistency with programme objectives (non-punitive)
- certainty of application (legal advice).

Table 1: Pros and cons of potential funding options

Funding Source	Options	Pros	Cons
Rates	General regional rates Overall ★★★☆☆	• All ratepayers contribute to programme as all derive some benefit from clean environment • Pollution is sufficiently important to be supported by ratepayers through LTCCP process	• Rural ratepayers object to paying for urban problems • Ratepayers may not see benefit for their area each year • Industry seen as main cause but not paying the true cost
Rates	General TA rates Overall ★★☆☆☆	• All City or District ratepayers contribute as all derive some benefit from clean environment • Pollution is sufficiently important to be supported by ratepayers through LTCCP process	• Challenge to get all of the TA's contributing • Disagreement on apportioning costs • Debate about the degree of TA responsibility for parts of the programme • TA's may not see benefit for their patch each year
Rates	Targeted regional rate for industry Overall ★★★★☆	• Pollution is sufficiently important to be supported by ratepayers through LTCCP process • Industry support is possible given the experience with rural targeted rate • Certainty and flexibility about securing sufficient funding and targeting contributors • Provides transparency about funds required where they are used and provides platform for expansion if successful • Community support exacerbator pays principle being used • Need for the programme is easy to demonstrate and sustain	• Industries may not see benefit for their sector or area each year • Good operators contribute the same as bad • All ratepayers should contribute as all derive some benefit from clean environment • Industrial sites with stormwater discharge consents are already audited as part of EW compliance monitoring and pay annual consent fees and shouldn't have to pay twice
Cost Recovery	Increased polluter penalties (e.g. infringement notices, prosecutions etc)	• Only exacerbators pay • Community support polluter pays principle being used	• Difficult to see more than a small proportion of total programme cost recovered based on ARC experience • Contrary to the principle of proactive auditing to assist industry

Funding Source	Options	Pros	Cons
	Overall ★★★☆☆	• Covering auditing costs lessens the burden on ratepayers	
Cost Recovery	Use of S150 of the LGA to charge for all visits (reasonable and actual)	• Covering auditing costs lessens the burden on ratepayers	• Contrary to the principle of proactive auditing to assist industry
		• All sites visited pay	• Alone won't cover the cost of all the programme components (unless a management component is also charged)
		• Only industry sector, industrial area, or catchment that is actually visited pay	• Responsible site operators pay as well as bad (just less)
			• Challenges to charges absorb scarce staff time and funding
			• Some debate on legality of S150 LGA *
			• Difficult to get sufficient 'seed' funding and there is an ongoing cost of governance so never 100% recoverable
	Overall ★★☆☆☆		
Central Government	Contaminated land fund	• Contribution toward costs that lessens the burden on ratepayers	• No certainty that application will be successful
		• Central Government seen to be playing a part	• Would only pay for part of cost and only for the first trial year, so no ongoing funding security
			• The exacerbator/beneficiary is not funding the programme
	Overall ★★☆☆☆		

* Chen Palmer's paper on the use of LGA s150 prepared for ARC

In summary there are a number of potential funding mechanisms that can be employed and a combination approach is likely to achieve the greatest amount of community support.

The focus of this programme is to proactively assist industries, who are both exacerbators and beneficiaries, to limit their environmental impact due to contaminated stormwater discharges. While there is a wider benefit to the community of improving water quality, generally speaking ratepayers are intolerant of polluters not being required to fund the full cost of their poor environmental practices being remedied. Therefore, an approach using a targeted regional rate on industrial property combined with limited cost recovery is most likely to be acceptable to both industry and the community generally. Cost recovery is appropriate where recalcitrant site operators are encountered. Such situations can require a number of visits, or incur contractor costs where discharge problems are so severe that immediate remedial works are required, or require sampling and analysis to provide proof for further action if required. It is unrealistic to expect wider industry ratepayers as a group to pay for ongoing poor site management by individual operators.

Central government funding, through the Contaminated Land Orphan Site fund, may be available for a pilot trial approach to determine how industrial site assessments can be linked into the regional council function of investigating land to identify contaminated

sites. Funding rounds are advertised by MfE twice a year; however, given the stage of development of the ISP[3] project, applying for funding now would be premature.

2.2.3 Assuring programme capability

Staff capability is an essential part of efficient and effective programme scoping, set-up and delivery. However, capability is much more than simply having adequate staff resources to undertake the work programme. It entails all aspects of the programme from robust planning instruments in regional and district plans through to adequate numbers of staff, who are well trained and appropriately equipped. The following sections explore the programme needs in terms of a range of capabilities which are then tabulated and rated in terms of importance.

2.2.3.1 Robust planning policy (regional and local)

Relevant planning provisions have been considered in this document in terms of the WRPS and PWRP in Appendix 3. The Planning provisions for each of the Waikato TAs have not been assessed in the preparation of this report due to time constraints. However, a cursory review of HCC's Proposed District Plan (PHDP) indicates that while there are generic provisions relating to industrial site management requirements. However, these provisions do not link specifically with land use causing stormwater contamination, nor would they allow HCC officers to require actions of industrial site operators to employ source control initiatives that prevent contamination from occurring in the first place. Some relevant excerpts from the PHDP are included in Appendix 4. It is my opinion that these provisions would be helpful when combined with the WRPS and PWRP provisions in any collaborative effort between the two statutory agencies.

Where plan changes are required at either (or both) District or Regional level to provide statutory backing for the ISP[3] programme it is essential that both operational and policy and planning staff have a good grasp of what is needed and why. Ideally a collaborative process involving both disciplines will result in more appropriate and practical rule framework. Given the extensive time periods required to traverse the plan change process, waiting for appropriate/supportive plan provisions before commencing is not recommended.

2.2.3.2 Implementation by skilled practitioners

The necessary technical skills required to conduct a thorough environmental site audit can take several years to accumulate through the 'school-of-hard-knocks' out in industrial areas via urban pollution response activities. In the author's view it is not a skill that can be wholly learned through courses or texts and a large part of what makes a good site auditor is the intuition and inquisitiveness that comes with experience on the ground (i.e. Where does that pipe actually go? Why is that material being stored uncovered in that location? What do the stormwater catch-pit contents look like?). A variety of standardized check sheets have been developed to assist with the basic components of site audits; however, it is impractical to take into account all of the potential permutations of site activities, layout, and operation making experience crucial.

Although not a prerequisite, ideally auditors would have a basic grounding in chemical contaminants and their environmental impacts through university or technical institute qualifications in the environmental sciences (students of engineering, geography and other sciences may also have an appropriate level of understanding as part of their degrees). Staff with a background in other disciplines, will need to go through a steeper initial learning curve to understand site management source control and contaminant causes and effects.

Experience with HCC indicates that there is a number of staff in various departments (e.g. Environmental Health and Water & Waste Services) that have the requisite auditing skills, or at least the foundations of the skills needed. However, it is unlikely that smaller councils will have sufficient staff numbers to have the luxury of specialised staff that are focused on one aspect of council business. Far more likely is the mixed

portfolio approach where site inspections would be one of a number of tasks required of the TA officers. In such situations the degree of specialisation required to audit high risk sites will be less likely to be present or acquired through experience.

Corporate memory is a potential component that is often overlooked but which can save significant amounts of staff time. In particular, savings occur where staff have previously visited a site and may have some connection with site management. TA staff are generally much more familiar with the industrial activities occurring on their 'patch', which makes them invaluable contributors to any project team due to their corporate knowledge and contacts.

Having a team member who has worked within an industrial sector in an environmental capacity is also extremely valuable to assess how the programme is best packaged to be well received by industry. It is important not to allow the programmed activities to be deflected by statutory requirements, such as consent time frames or pollution response activities as has happened with other councils' strategies (Auckland, Canterbury and Wellington). The solution is to secure dedicated staff to undertake proactive work only.

2.2.3.3 Training

Training, much of it on-the-job, combines the technical/scientific understanding and planning/RMA requirements. There are a number of specialist industrial site auditing qualifications that can be gained overseas (e.g. Quality Standards Australia and the Institute of Environmental Management and Assessment (UK)) but no NZ based courses that could be yet be recommended (the ARC was seeking expressions of interest to develop a specific industrial site auditing course tailored to NZ legislation and circumstances in early June 2007). Quality Standards Australia run specialist courses for many aspects of the auditing process; however, the course is slanted toward Australian local government structure and environmental legislation. The courses can be run in New Zealand where there are sufficient numbers and generally cost around NZ $700 - $1,000 per attendee. While there is the possibility of obtaining formal accreditation as a QSA 'Approved Assessor' the number of auditing hours required under the supervision of a qualified assessor after passing the theoretical examination, makes this difficult for council officers to achieve.

Councils also often run standard in-house training courses on issues that will become useful in auditing situations, such as: negotiation/facilitation/mediation skills, conflict resolution, time management, evidence gathering, scientific sampling techniques and the like. These should be packaged into a tailored Individual Development Plan for each staff member based on complementing existing experience via in-house training to remedy any weaknesses. There are also a number of RMA-specific courses run by MfE, particularly around compliance and enforcement, that will be useful.

Many regional councils have staff manuals, such as the Auckland and Northland regional councils' Pollution Response Manuals (PRM), that provide guidance on standardised approaches and templates for most circumstances that officers encounter in the field undertaking pollution response activities. Health and Safety practices are particularly important and will ideally exist interspersed within a PRM type document.

In addition to the above training and guidance documents; however, there is no substitute for a good teacher. Coaching and mentoring of junior staff by an experienced and capable senior officer provides the quickest and most effective method to up-skill staff. Coaching/mentoring is an ideal method when coupled with plenty of site visits to audit actual sites and resolve real world problems.

2.2.3.4 Organisational support

Programme support embraces some of the components already discussed such as robust policy, technical understanding, training and supporting documents. However, it goes beyond these to evaluate the ability of the organisation to support the position being taken by officers undertaking ISP^3 audits via other departments or individuals.

Programme support through line management needs to occur from the CEO down to the team or project leader. Experience from other programmes has shown that at times senior management will be drawn into debates about the importance and/or value of the programme being undertaken with the CEOs and/or senior management from large industries or business associations. Senior management yielding to external pressures and not supporting the position taken by staff (provided it is justified) will seriously undermine the credibility of the programme and the morale of staff involved.

The programme must be underpinned by robust technical and engineering support, either internally or through external service providers (such as NIWA, Landcare, ESR etc) and quality legal support in a few rare but important situations.

The importance of peer support should not be underestimated, from actual physical reinforcement on a site through to conducting an event autopsy to learn how to do things better. Supportive fellow officers with complementary specialist skills to turn to for advice are invaluable, so team dynamics are also an important factor.

2.2.3.5 Tools

The tools necessary to underpin an efficient and effective ISP^3 can be separated into guidelines, technology, and hardware and some of these have been discussed earlier in this report. A detailed description of some of the best practice guides and fact sheets used to support recommended programme components are detailed in Section 6 and therefore will not be mentioned further here.

It is essential to ensure that the ISP^3 team is fully equipped with appropriate vehicles, such as 4 wheel drive pollution response vehicles. These vehicles should contain all the site investigation and sampling equipment that is likely to be needed, based on the industry type/s to be audited. Staff must also be fully equipped with health and safety equipment (such as hard hats, safety boots, fluorescent safety jackets etc).

A laptop computer with the TA drainage network maps loaded onto it that can be taken into the field will save a significant amount of time trying to trace how the stormwater system interconnects when visiting sites. Similarly a database (such as exists for HCC) with site land use information, loaded onto a laptop, will also be a major advantage, particularly if information about proactive and reactive visits (current and historical) and any spill events are included.

Standard template forms have been previously mentioned; however, if these templates could be loaded onto handheld IT devices and filled in out on site, doubling handling of information (and the potential for errors) will be minimised.

2.2.3.6 Conclusion

Table 2 below lists all of the capability needs identified for a successful ISP^3 programme and ranks their importance to the programme in terms of essential, valuable and preferable, or just valuable.

Table 2: Auditing team capability needs

Requirement	Description	Contribution	Reason
Policy and Planning	• Robust WRP ISP^3 provisions	Valuable & Preferable	Can defer to RMA as a last resort until plan can be changed
	• Plan/policy linked to ISP^3 knowledge	Essential	Changes in Plan provisions must be practical and pragmatic
Auditing skills	• Technical skills (environmental/ engineering)	Valuable & Preferable	Advice can be gained from other council staff or service providers

Requirement	Description	Contribution	Reason
	• Auditing qualifications & experience	Essential (for at least one team member)	One staff member can act as mentor to other staff
	• Plan/policy knowledge	Valuable & Preferable	Advice can be gained from other council staff
	• Industry specific experience	Valuable	Advice can be gained from other council staff or service providers
	• corporate memory of industry types, locations etc	Valuable	Advice can be gained from databases or other council staff
Training	• RMA courses	Valuable & Preferable	Advice can be gained from other council staff or service providers
	• Relevant council courses	Valuable & Preferable	Advice can be gained from other council staff
	• Health & Safety	Essential	Each team member must be aware
	• Coaching/ mentoring	Essential	One staff member must be able to assume this role (may change for different aspects of the job)
	• Operational guidance manuals	Valuable & Preferable	Lack of a standardised approach is inefficient and less effective
Support	• Supportive senior management	Valuable & Preferable	Lack of a senior management support will undermine the programme
	• Legal back-up	Valuable & Preferable	Legal support may be important where there are confused responsibilities (EW/TAs)
	• Technical back-up	Valuable & Preferable	Technical support may be needed for recalcitrant operators
	• Peer support	Valuable & Preferable	Lack of peer support across Council will undermine the programme
Tools	• Agreed project framework		Lack of an agreed framework will result in programme failure
	• Specialised Vehicle & equipment	Valuable & Preferable	Lack of specialised equipment will slow programme delivery
	• Specific industry best practice guidance documents	Valuable & Preferable	Lack of specific guidance documents will slow programme delivery
	• Health & Safety Equipment	Essential	ISP^3 requires careful attention to Health & Safety due high-risk industries being audited
	• Database drainage maps and other IT	Valuable & Preferable	Lack of database, drainage maps and IT support will slow programme delivery
	• Standardised forms and guidance manual	Valuable & Preferable	Lack of tailored forms and guidance documents will slow programme delivery

Working through the components identified in Table 2 and using on the ground experience from ARC trial and error shows that successful proactive auditing teams work best where they are:

- purpose built
- constituted with experienced personnel
- supported with specific auditing and other specialist training
- focused on proactive auditing and not distracted by other responsibilities

- well equipped to undertake auditing activities (hardware and IT)
- underpinned by robust policy and with supportive statutory partners
- supported by clear, concise, practical and pragmatic operational guidelines.

Therefore, this combination of features is recommended for the ISP^3 programme.

2.2.4 Build community and industry buy-in

The extent to which the wider community generally and industry in particular, need to be brought into this process depends on the ISP^3 programme components that are chosen. The LTCCP 2006 -2016 has raised the expectation in the public mind that a proactive ISP^3 programme will be developed, agreed and implemented.

Communication with the public about what they are getting for their ratepayer dollars is extremely important. Information provided in advance of embarking on a programme component must be clear about why the project is needed and what the outcome will be. In the case of water pollution there has been sufficient general information provided over the years to raise public awareness. Attitudinal surveys carried out by regional councils throughout New Zealand have shown a general concern by the public about degraded water quality (it always ranks highly) and have confirmed that in the public mind, industry is the major culprit.

In addition pollution prevention information also raises awareness about polluting activities around the home and unacceptable practices within the work environment. Education of children in particular has a trickle-down effect on parental behaviour as children will remind parents about waterways and pollution effects through after school project work.

ARC experience with industrial area or target catchment approaches has shown that the local media (and public) will be intensely interested in the project (see Sections 3.1.4 and 3.1.5). Local newspaper articles prior to the surveys being carried out helps to reinforce the '***help them out not catch them out***' message that we are trying to portray with industry. Local papers are also highly likely attend on the day an area is being audited if advised, providing a photo opportunity for local politicians, preferably with local school children and/or community members helping out. Follow up articles containing information on the good, bad and ugly sites and clean-up activities will also result if information is provided.

Some of the programme components have a strong community participation component, particularly where a local community group (or school) decides to 'adopt' a waterway, regularly assess its condition and report any problems to statutory agencies. In addition community vigilance of inappropriate activities leading to discharges from industrial sites into roadside gutters or streams and knowledge about who to call, enhances community engagement with the programme. The ability of community groups to be involved in various programme components and "dob-in" a polluter is discussed separately in Section 3.

The power of the community to change business attitudes and behaviour should not be underestimated; negative publicity about activities that contaminate stormwater is powerful, as are positive messages about businesses that do the right thing. For example if consumers hiring contractors sought that each have an environmental management plan consisting of appropriate wash water containment and disposal, poor operators would either improve their practices or go out of business quickly. Many people do not buy on price alone anymore, so increasing the profile of appropriate management practices for contractors is both timely and practical. As part of the ISP^3 programme EW could consider issuing Regional 'clean-green process' certificates to good operators which these businesses could use when tendering for work.

Industry is the solution as well as the problem so it is essential that coupled with raising awareness is behavioural change. Achieving industry buy-in is important because indirectly through rates or directly through cost recovery, they will be paying for the programme. As stated in Section 2.2.2 on securing funding, the positive part for industry is the 'even-playing-field' whereby good operators do not get financially penalised for spending the extra money to operate their business in an environmentally sustainable manner. It is worth noting that a number of studies, and experience from around New Zealand have shown that the costs of pollution prevention are often offset by better/safer working conditions, lower product losses, and lower waste volumes leading to lower disposal costs.

Recent changes to taxation legislation have provided incentives to industry for installing pollution prevention processes, plant or equipment. While the initial capital outlay is still required for the plant or equipment required, the provision of tax breaks is a valuable argument to use against recalcitrant operators from implementing necessary improvements.

Assessment of sites in industrial areas or across an industrial sector provides an opportunity for 'peer pressure' on neighbouring industries or fellow sector operators. Experience elsewhere in New Zealand has shown a marked lack of tolerance of operators within an area or sector who are seen to bring disrepute and council attention to the industry. Industry associations in particular are keen to try and promote practices that will see their industry viewed in a better light by the council and community. In some cases this can lead individual operators to 'dob-in' a competitor within their industrial sector to ensure that every operator is being assessed and brought to the same level (the even-playing-field).

In some circumstances industry champions, either individuals or associations, emerge who wish to act as a vehicle for the message of better environmental performance for their industry. In any event supportive partners within industry are an essential component of the development of practical and pragmatic Codes of Practice or Best Practice Guidelines. Input from practitioners on the ground who understand how the particular industry sector operates are essential ensure that industry guides are meaningful, practical and appropriate.

2.2.5 Deploy best practicable option solutions

The development and deployment of best practicable option (BPO) solutions is critical to ensuring that EW provides good customer service to the industry sectors, target areas or catchments that are audited. The credibility of the ISP^3 programme will be totally undermined (not to mention the staff concerned and the organization as a whole) where poor quality, irrelevant or incorrect advice is provided. Experience (with the ARC IP3 programme) shows that the greater the degree of specificity and tailoring to the industry sector that can be done the better advice will be received and the more likely it is to be implemented.

The development of BPO solutions will vary from one industry sector to another and there is no 'one-size-fits-all' approach that can be employed. It is recommended that understanding each industry and the unique combinations of operational constraints and contaminant types is essential before commencing. Some of the BPO tools are further described in detail in Section 6, including:

- Codes of Practice - best jointly produced between regulator and industry;
- Best Practice Guides - best jointly produced between regulator and industry;
- Pollution fact sheets - regulator developed for easily solved, common, recurrent polluting activities;
- Stormwater treatment device recommendations – regulator developed specific to signature contaminants associated with an industry sector'
- Source control practices advice - best jointly produced between regulator and industry and specific to industry sector;

- Environmental management plans (EMP) - best produced by site operator, specific to each site and regularly reviewed and updated;
- Environmental operations plan (EOP) - generic approach developed by the regulator but needs to be completed by the operator for each site.

In addition some specific resources also further described in Section 6 to help officers undertaking audits are as follows:

- Site specific database (site locations, activity types, contact details, previous dealings, chemicals used etc);
- Drainage maps showing connections into the public stormwater network infrastructure;
- Vehicles and sampling equipment;
- Pollution response manual and Health &Safety manual;
- Standardised site auditing forms; and
- Site environmental performance rating formula.

3 Pollution prevention programmes around New Zealand

For the purposes of this report the extensive experience gained by the Auckland and Greater Wellington Regional Councils and Environment Canterbury have been used to generate the series of options explored further in this section. The contributions of these organisations in providing supporting information to assist in the compilation of this strategy document is acknowledged and appreciated. Details of the programmes run in each jurisdiction are provided in the sections below.

3.1 Auckland Regional Council

The first formalised comprehensive proactive industrial site auditing project in Auckland was the Manukau Harbour Action Plan (MHAP) in the late 1980's. The Manukau Harbour was chosen due to the considerable community concern being expressed, in particular by local iwi, about the health of Harbour water quality and biological resources. The industrial component of the programme involved assessment of approximately 3000 industrial sites in the target catchment over a period of three years by three council officers (some summary statistics are provided in Appendix 5). This paradigm shift in the way pollution problems were tackled involved proactively visiting 'at risk' industries and auditing them before problems arose instead of waiting for the problems to emerge via complaints.

Proactive auditing revealed that a significant proportion of problems in industrial areas go unreported as a high proportion of sites had actual discharges to stormwater systems occurring when they were visited. It also revealed that there were an even larger number of potential problems waiting to happen. And finally the auditing of every site enabled the ARC to better consider the cumulative the impacts of many small discharges. Based on this information the ARC concluded that a purely reactive programme was not adequate to meet their statutory responsibilities.

The lessons learned through this programme resulted in the ARC continuing with a proactive auditing component to its pollution response programme through the 1990s. The council also trialled a number of different approaches which were intended to complement each other and together provide a comprehensive package to work with industry, like the jigsaw shown in figure 1.

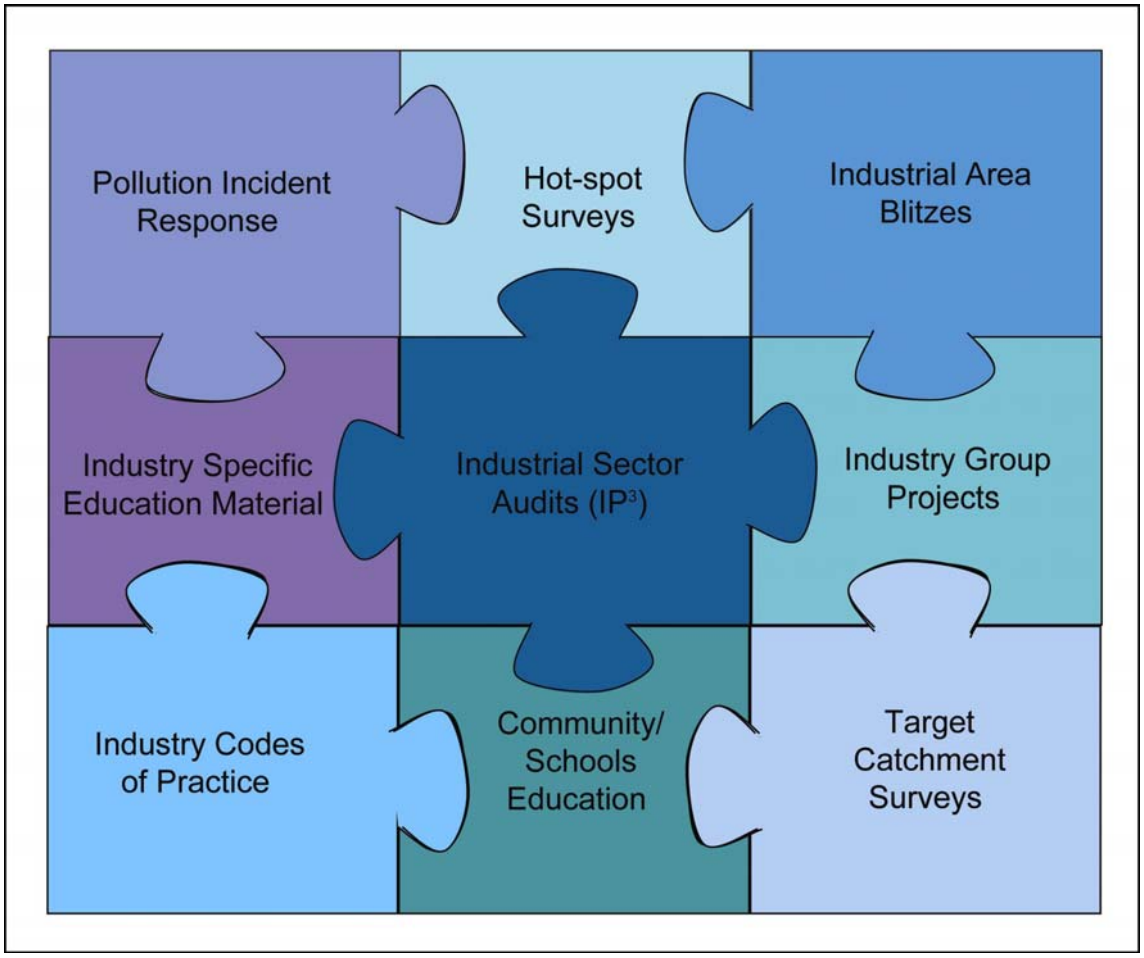

Figure 5: ARC Industrial Pollution Prevention Programme Components

It became clear that the drivers for, and value of, each of these approaches did not apply universally (one size does not fit all). A number of the pilot projects in the last 10-15 years were undertaken by the ARC's pollution response team. The problems that arose for officers due to conflicting workload demands clearly showed that unless a dedicated team was established and proactive activities were clearly separated from regulatory activities like pollution response and consenting, proactive work did not get completed in a timely manner (or sometimes at all). Each of these programme components trialled is described in greater detail in this section and is evaluated in terms of its relative ability to deliver on the identified programme objectives.

3.1.1 Proactive industrial pollution prevention programme (IP^3)

The Auckland Region is home to a significant proportion of New Zealand's industrial and trade activities (hereafter referred to as ITA's), estimated from business registers to account for approximately 35,000 sites. ARC data from the MHAP indicated that in recent years there has been a net growth rate in the number of sites of around 5% and a change ownership/activity of 5% per annum for the industrial/commercial sector. This change coupled with changes in management and staff creates a significant problem in terms of retaining an understanding stormwater contamination issues. Without a regular programme of industrial site auditing and revisits to check compliance, significant 'slippage' in site management and therefore stormwater protection will occur.

The size of the challenge in Auckland required prioritisation of industries by the ARC to better focus the available resources for ISP^3 auditing to where they would have the greatest benefit. A number of international guidelines from agencies, such as the United States Environmental Protection Agency (USEPA) and the Australian and New Zealand Environment and Conservation Council (ANZECC), identified the industrial activities that have demonstrated a high risk of polluting land and/or water. This international experience combined with the ARC experience of Auckland industrial site

practices from the mid-1970's resulted in the formulation of simple 3-tier hierarchy – high, medium and low priority. Applying this system resulted in an estimated 24,000 low, 5,000 medium and 2,500 high risk industrial sites. The ISP^3 focuses primarily on the sectors containing the 2,500 high-risk sites.

While the Waikato has a much smaller number of ITA's to deal with the proportion of high, medium and low risk sites is likely to be the same as Auckland, as are the problems associated with industry growth and changes in ownership and staff turnover.

The ISP^3 has the primary objective of protecting and improving land and water quality from ITA's through targeted pollution audits or assessments. It seeks to ensure compliance with sections 15(1)(a), (b) and (d) of the Resource Management Act by:

- identifying and stopping any actual pollutant discharges to land and/or water
- identifying and eliminating, or putting in place site management controls to address, potential discharges
- ensuring ITA operators are prepared to deal with accidental discharges through the preparation of emergency spill response plans.

The ARC also used a ranking process to prioritise the order that high risk ITA's should be 'approached' through the ISP^3 programme. In evaluating priorities consideration was given to a number of risk factors associated with the different industries, such as:

- contaminant types typical of each industry type
- the potential environmental harm the contaminants cause (acute or chronic – short or long term)
- historical experience of the likelihood of contaminant release for each ITA type
- approximate number of sites in the region and likely size of the business.

Additional weighting factors to be considered included:

- industry partnerships that have already been established
- previous actions with a particular site, industrial sector, industrial area or catchment (level playing field issues)
- industries that have established codes of practice (CoP) or best practice guides that met the ARC's our environmental requirements or where other agencies such as ARC or ECan have already developed industry-specific pollution prevention information
- geographic spread in terms of efficiency of site assessment considering travel time.

Ranking of ITA's based on the above factors enabled the ARC to focus energies that would result in the best environmental outcome before embarking on their auditing programme.

Each ITA type was treated as a project and assigned a project 'manager' from the proactive team, who was given responsibility with all aspects of the project, including:

- identifying specific site management problems common to the ITA that result in stormwater contamination
- utilising international or local information to develop a best practice guideline for the ITA
- formulating a list of sites throughout the region which undertake the activity
- establishing contact with a relevant industry group or association
- preparing specific education material for the ITA
- sending out the ARC's 'do-it-yourself' industrial site audit kit the Environmental Operations Plan (EOP) and/or other relevant educational material
- organising the assistance of fellow officers to conduct the audits
- conducting the site audits, stopping problems that are occurring and providing education to operators about preventing further problems
- co-ordinating any follow up visits, correspondence or enforcement action
- preparing a final 'state-of-the-industry' report within the region.

High risk industrial sectors audited by the ARC to date include: timber preservation, electroplaters, anodisers, chemical companies, scrap metal dealers and waste disposal companies. The proactive site assessments have typically identified between 2-5 actual discharges and 4-8 potential issues for each site audited, further detail is contained in Appendix 5. Finding a high risk ITA through these surveys that is operating in a manner that resulted in 'clean' stormwater discharges was relatively rare.

Once the actual and potential pollution issues have been rectified, experience showed that performance slipped over time due to changes in site ownership, management and staff, leading to a loss of corporate memory and awareness of, and commitment to, environmental performance. It was therefore found that for the ISP^3 work to be effective in achieving lasting changes it was essential to establish a relationship of enduring value between the ARC and the business by a regular programme of education and revisiting. Since 2001 the ARC has chosen to formalise this through the requirement for ITA discharge consents for high risk activities.

The team have also tackled several lower risk industry sectors based on other 'drivers'. Service station sites are relatively highly regulated with around 150 of 500 regional sites with stormwater treatment devices and discharge and consents. The ARC stormwater consents and compliance section requested the sector be audited to assess the difference between consented and un-consented sites regarding environmental performance. Unfortunately both types had problems with spill plans, staff training, and the management of forecourt and workshop areas. The environmental consequences from consented sites was found to considerably less as they all had stormwater treatment devices, whereas most un-consented sites did not. Having a treatment device created some complacency in site management, although treatment devices were frequently not well maintained.

Bus companies were also chosen for auditing to link with the ARC's passenger transport responsibilities. The council considered that companies receiving substantial amounts of public money to operate passenger transport services ought to be complying with all the relevant environmental requirements. Approximately 20 sites were assessed and all were found to have significant problems with stormwater quality management. A requirement regarding company environmental performance has now been inserted into tender documents which has raised the bar for industry performance.

3.1.2 Industry group projects (IGP)

Industry group projects (IGPs) are focused on those industries that have some combination of the following characteristics:

- they are mobile (that go to the client) and therefore change location often;
- they are usually small operations involving an owner/operator and few staff;
- there are a large number of them and they change ownership, name, management and/or staff frequently;
- they have resulted in a high number of pollution complaints due to visibility of either the discharge from the operation or the wastewater produced (such as foams or discolouration);
- they generally produce contaminants that are not acutely toxic by themselves (although some are) but result in cumulative and/or aesthetic effects; and
- there are relatively simple, pragmatic and inexpensive solutions in terms of discharge and management.

IGPs usually involve:

- understanding the practices that are undertaken, contaminants generated and their effects
- collation of a region-wide list of operators and /or sites
- contact with all of the operators by telephone to advise of the project

- contact with an industry association where one exists
- development of practicable list of management options
- the formulation of some targeted education material
- a bulk mail-out of a questionnaire and education material
- follow-up calls to practitioners who don't respond
- audits of those sites or operators who do not engage in the process.

Mobile contaminant sources such as painting contractors, plasterers, concrete cutters, and water blasting contractors, are prime examples of industry groups which are hard to track but provide a significant proportion of complaints each year.

By way of example, concrete cutting was identified as a major source of complaints by the pollution response team and several significant fish kills were tracked to this source. Concrete cutting wastewater has the same pH as raw cement and is therefore lethal to freshwater aquatic organisms even in small doses. All concrete cutting operators (more than 50 operators) in the region were identified and sent a letter and fact sheet detailing the impacts of concrete cutting activities on the environment and outlining different methods to reduce those impacts. Several presentations were made by ARC officers to the Auckland Concrete Cutting Association in an effort to raise awareness of potential issues.

Initially many companies were dismissive of the availability of practicable options for the management of concrete cutting wastewater. However, several innovative ideas were explored and practical methods of minimising discharges were identified by the industry themselves. The ARC received very positive feedback from companies who began operating in a more environmentally friendly manner who were awarded contracts over their competitors. This competitive advantage ensured that all remaining players adopted the new 'best management practices' advocated by the ARC and the industry or left the industry and that new entrants into the industry started operating correctly from the start.

3.1.3 Hot spot monitoring

In December 1998 the ARC initiated a fortnightly survey of 50 of the most degraded industrial waterways in the urbanised part of the region.

The objectives of these surveys were to:
- proactively locate and resolve water pollution problems in 'high risk' areas that are not commonly observed or reported by the general public
- collect qualitative data via regular inspection on Auckland's most degraded and/or at risk waterways
- raise the profile of the pollution control team through increased exposure while undertaking the surveys in the ARC's 'high profile' sign written vehicles
- gain valuable feedback on the effectiveness of council pollution control (education) programmes.

Sites were selected on the basis of officer knowledge of where clusters of high-risk industries occurred near waterways that could be easily accessed. These locations were put into logical sequence that formed a 'run' covering 10-15 of the worst clusters of industrial sites in a part of the region over a four-hour period. In general, the sites chosen are in parts of catchments not frequented by the public for recreational use resulting in few complaints being lodged despite significant problems. Once sites gain a reputation as impacted the public perceives them as being of lower value because they are "always polluted" or that "nothing lives in there" (see the common urban pollution myths in Section 2.1.1).

A hotspot run involves an officer touring a predetermined route around Auckland's heavily industrialised areas and undertaking a cursory assessment of the state of the watercourses that service those areas. Three different monitoring runs (northern,

southern and western) were established that aggregated to a total of fifty hotspot sites for inspection. Each run was undertaken at a random time, on a random date within a two-week period, to try and ensure that regular discharge events were not missed.

At each hotspot site a visual inspection of the watercourse is undertaken and details such as floating material, turbidity, discoloration and odour are recorded as well as fundamental monitoring of water quality parameters such as pH and temperature. This information was recorded to determine the number of pollution incidents which occur within these catchments that go unreported and to get some measure of general water quality improvement as a result of the ARC's industrial pollution prevention programme. Any detailed water quality information obtained where a pollution problem is found can also be used for enforcement action taken by the council with regard to unauthorised discharges.

When evidence of an ***actual*** pollution problem was identified during the inspection, the officer carrying out the run contacted the duty pollution response officer and commenced an investigation back through the drainage system to try and identify the source of the problem. On arrival of the duty officer, the 'hot-spot' monitoring officer handed-over the investigation and continued with the hot spot survey (this handover was important as otherwise the 'run' would seldom get completed).

To qualify as an actual problem, contamination present was clearly identifiable by sight or odour and at a quantity that would enable it to be followed back to a source. Therefore, general 'background' contamination such as traces levels of contaminants, slight discoloration, or faint odour and the like, are noted but no time is spent trying to trace them unless they are recurrent and persistent.

A measure of the success of this approach was the southern group of sites where actual problems were identified, traced and resolved on 9 occasions out of 13 runs. This programme was discontinued in early in 2001 following a decision to focus staff resources on ISP^3 proactive auditing.

A similar community based assessment tool was devised as part of the Waicare programme in 2003 and has been successfully used by community groups in Auckland. A simplified and improved ISP^3 Visual Smells Checklist, based on Waicare experience is provided in Appendix 7 should statutory agencies or community groups in the Waikato wish to undertake this type of monitoring project.

3.1.4 Target catchment surveys

The ARC commenced a pilot programme in 1997 to assess the practicability and effect of proactively auditing of all industry sites within a small catchment regardless of industry type. The cumulative impact of many small discharges was not being dealt with via reactive individual site assessments or industry specific projects. It was also anticipated that there would be greater community buy-in where impacted waterways were cleaned-up.

The pollution team had not previously established information about the level of water quality degradation from a site or area and subsequent improvement, except when responding to significant pollution incidents such as fish kills for the purpose of enforcement action. The in-depth evaluations, including water quality and biological assessments, were not historically pursued primarily due to resource constraints required of a whole-of-catchment approach. However, in industrial areas the waterways showing the greatest level of compromise were often small, highly modified and piped for much of their length, which could be dealt with at the sub-catchment level and relatively quickly.

It was considered essential to link environmental quality assessments with site audit results to ascribe cause and effect relationships and provide a measure of environmental benefit to council effort. In addition valuable feedback was anticipated

on the effectiveness of land use planning policies, provided in District or Regional Plans, for protecting environmental quality.

A standardised template for industrial site auditing for target catchment surveys was developed and an example is shown in Appendix 6. Summary data of the types of industries assessed and problems found for some ARC examples are shown in Appendix 5 (note: before and after water quality and biological resource improvement data has not been summarised).

One important lesson learned through the target catchment surveys is best illustrated in the Homai Stream catchment in Manukau City. This is a largely industrial catchment that has a chequered history of abuse. All industrial sites within the catchment were assessed in 1997 and then again 3 years later in 2000. Despite the significant auditing effort by the ARC and improvements by many industries in the catchment there was still a considerable amount of 'slippage' over the 3 year period between surveys. The loss of traction with industrial site within the catchment was attributed to loss of corporate knowledge within the companies due to:

- Changes in ownership (and corporate ethos);
- Changes in management (and commitment to pollution prevention)
- Changes in product manufacture;
- Staff turnover and insufficient training;
- Lack of an enduring relationship with the council through regular audits.

An ARC review of the resource requirement of this type of programme concluded that it was less efficient than other options, primarily due to the staff time and analytical costs of sampling and analysis. Further target catchment surveys have not been undertaken since 2000.

3.1.5 Industrial area blitz

Area blitzes fill a particular niche in the ARC's pollution control strategy between the target catchment approach, which looks at all potentially polluting activities in a catchment, and target industry/IP3 surveys that look at one or a few specific sites. An industrial area blitz is similar in form and function to a target catchment survey without the waterway investigations to identify resources and impacts.

Areas are identified for effort via an auditing 'blitz', because they are:

- identified by other programmes as having a large number of ongoing problems (traced and un-traced)
- identified by other surveys as clusters of 'high risk' industrial practices that have not been audited before
- clusters of industrial activity in outlying townships
- discrete areas of industrial activity serviced by a common piped stormwater network that can be readily surveyed by a group of officers as a block.

The purpose of an area blitz, like other ARC proactive programmes, is to resolve any contamination problems found on site identify potential problems and provide education material to the site owner/occupier about their responsibilities under the RMA.

Examples of area blitzes carried out by the ARC and summary results can be found in Appendix 5.

3.1.6 HSNO compliance assessment trial

In May 2005, the ARC commenced a trial to ascertain the practicalities and challenges inherent in undertaking enforcement of the HSNO Act in conjunction with exercising its normal duties under the Resource Management Act 1991 (RMA). The trial lasted for approximately 18 months and was carried out under contract to the Department of Labour (DoL).

The 2005 amendment of the Hazardous Substances and New Organisms (HSNO) Act (called the "Macropatch" Bill) enables regional councils to decide whether they want to become HSNO enforcement agencies. Prior to this change the Environmental Risk Management Authority (ERMA) had secured funding to operate a trial with selected regional councils to assess the practicability of regional council involvement to undertake HSNO compliance activities in conjunction with their RMA responsibilities. This trial was intended to inform the proposed changes to the HSNO legislation but was overtaken by them. By 2005 when the trial commenced the funding had been transferred to the Department of Labour (DoL) for them to contract the three participating regional councils (Northland Regional Council - NRC, Auckland Regional Council - ARC and Taranaki Regional Council - TRC).

The services purchased by DoL from the participating councils can be summarised as follows:

- HSNO compliance assessments at industrial sites the ARC proactively inspects as part of its industrial pollution prevention programme
- HSNO compliance assessments on new industrial sites that the ARC inspects as part of its industrial pollution prevention programme
- Regional Hazardous Substance Technical Liaison Committee attendance and servicing
- notification of the DoL enforcement officer on duty when attending incidents.

The contract emphasis was on education, information gathering and information dissemination and any necessary enforcement action is to be transferred to DoL for action.

After redirection by DoL, the ARC focused HSNO compliance work on sites identified as “high risk” in a pollution prevention area blitz that was being in the Mt Wellington industrial area. Other sites “picked up” for HSNO compliance were derived from pollution incident responses, and referrals from DoL and the Fire Service. Sites receiving compliance monitoring visits for their industrial or trade activity consent were also assessed.

A standard approach was followed for each site, consisting of:

- an initial site visit to ascertain the type and quantity of substances held or used on the site, and the nature of the site infrastructure and equipment
- a follow-up letter is sent outlining the company’s legal obligations under the RMA and HSNO (eg the need for a Location Test Certificate or an Approved Handler), accompanied by relevant educational information
- follow-up visits are undertaken, and in some cases several of these are necessary over a period of months before compliance is achieved (and some were still to comply a year later).

The lessons learned by the ARC can be summarised as follows.

- For greatest efficiency and effectiveness HSNO compliance would be integrated into the ‘normal’ work programme of council officers who undertake air, land and water pollution response, pollution prevention and consent compliance assessments (similar to the TRC approach). Relying on a limited number of suitably trained officers is likely to result in loss of expertise and knowledge and lack of continuity due to staff turn-over.

- The impact on workload can not be underestimated, officers found that generally HSNO compliance assessments absorbed huge amounts of staff time relative to the equivalent RMA compliance assessment.

- As expected regional council expertise is best utilised dealing with industries that represent significant RMA pollution potential as well as high risk from the use and storage of hazardous substances subject to HSNO. Prioritisation of such industries

(as proposed for the ISP[3] Programme) and working proactively with the relevant industry sectors would provide an opportunity to gradually up-skill regional council staff in a range of HSNO specific matters.

- Access to relevant databases, resources and training opportunities communication between agencies are essential to avoid double-ups (ie two enforcement agencies inadvertently dealing with the same company) wasting resources and potentially giving conflicting advice.

- Information and training must be readily available for both statutory understanding of the HSNO Act provisions, particularly enforcement, and practical knowledge about hazardous substances. Although regional council staff are knowledgeable of environmental of toxic and ecotoxic substances, the breadth of knowledge required for HNSO enforcement is usually not part of this repertoire. A shortage of skills in the hazardous substances management field is widely recognised throughout New Zealand.

The ARC's Environmental Management Committee resolved, in March 2006 not to renew the DoL HSNO enforcement contract with the DoL. The ARC did not discount becoming involved with HSNO enforcement at a later date. At the time this report was prepared NRC and TRC had decided to continue with the trial.

3.1.7 Tools

To support the range of proactive interventions with industry a number of specific targeted education tools have been developed or plagiarised from other jurisdictions and modified for the Auckland context. These tools include: the Environmental Operations Plan (EOP), a template site environmental management plan, a site incident database, pollution fact sheets for common pollution activities, industry codes-of-practice, and industry best practice guides. Details of these tools are presented in greater detail in Section 6 of this report.

3.1.8 Wider community education and action programmes

The value of wider community education programmes, particularly those encompassing taking action to monitor and restore waterways, cannot be underestimated. Frequently statutory agencies ignore "community monitoring" information because they do not recognise its value. It is important to remember that community monitoring occurs at a location valued by a community group of interest, often in areas that will not achieve sufficient priority for Regional State-of-the-Environment monitoring or TA monitoring. The community are often only able to monitor basic chemical determinants which do not have the quality control or scientific accuracy necessary for regional monitoring information. However community observations and simple assessments using the three basic senses: sight, smell and common, taken on a regular basis can build up a valuable database of waterway abuse and improvement over time as problems are resolved.

Programmes dealing with the education of school children and community groups may be seen as dilution of ARCs efforts and using up scarce staff resources. However, it is important to remember that children are the next generation of potential polluters (or they could become eco-heroes) and that many have parents who own or work at an industrial site. Most of the community members involved work somewhere, and all are consumers of goods and services produced by industry. Consumer choice in terms of not supporting companies that do not operate properly resulting in pollution should not be underestimated through both local choice of a contractor or supplier and even green investment through the share market. Word of mouth regarding bad practice is also very powerful and many industries take negative publicity very seriously.

If all community group members started questioning suppliers and contractors about their environmental protection approaches in production (while remembering the

common urban pollution myths in Section 2.1.1) and not supporting poor practices improvements would rapidly occur.

Stream Sense is a schools focused stream education programme developed by Environment Waikato and launched in 1998. There are other similar programmes in New Zealand (e.g. Hills 2 Ocean in the Hawkes Bay) that are generally focused on rural water quality impacts and are aimed at schools.

The Auckland equivalent, Wai Care, was developed as a collaborative effort between 4 of the Regions TAs and the ARC (although all 7 now belong). This programme is designed for use by schools or community groups and is more focussed on urban impacts than other programmes reviewed. It has several unique features which could be easily adapted for assessment of urban environments in the Waikato.

Of particular relevance to this project is the Community Stream Assessment module in the Field Manual (Book 3) which could be modified for either council, community or school use in the urbanised part of the Waikato Region. A modified and simplified version of the system used by Wai Care, the ISP^3 Visual/Smells Checklist is included in Appendix 7. Alternatively the Wai Care approached can be downloaded from their website at www.waicare.org.nz and clicking on the library icon.

The Great Drain Game is a hands-on educational activity teaching children about how to dispose of common household wastewater correctly, avoiding pollution of waterways. The rules for the game and background information is presented to the class by "Kids-4-Drama" a group of professional actors and educators who introduce the game, equipment and pollution message with humour and fun as part of their 45 minute presentation.

The games consists of life size models of inside and outside drainage systems (e.g. stormwater catch-pit, kitchen sink, toilet and gully-trap) and other disposal options (e.g. recycling station). Each player is tasked with determining the right place to dispose of a waste type that they are given at random, ranging from soapy water and paint residues through to used oil. They get to tip the wastewater (we use water with food colouring for safety purposes) down the drain of choice and watch the results on a model waterway (if they get it wrong). By the end of the game the children leave enthusiastic, motivated and aware that "rain only" goes down stormwater drains.

Enviroschools is a programme that was developed in the Waikato in 1993 which has now spread across most of New Zealand aimed at educating school children about minimising their environmental footprint and undertaking restorative and enhancement projects at local waterways.

3.2 Environment Canterbury

Environment Canterbury (ECan) have been developing their proactive site auditing capabilities as part of their 'Regional Hazardous Substance Management Programme' for the last 5 years (Darren Patterson pers. comm.). The mandate for the establishment and expansion or this programme has come from the provisions contained in ECan's RPS. The need for proactive initiatives has been reinforced by some recent large spillages of hazardous substances that in one case did have, and in another could have had, dire environmental consequences for Canterbury waterways. These incidents have resulted in significant costs for both the companies concerned and ECan for clean-up and restoration and both have resulted in enforcement actions being taken.

3.2.1 Pollution prevention guide

ECan's Environment Quality Section has undertaken a number of initiatives over the past 3-5 years to proactively reduce the risks posed by industry on the environment. The main vehicle used to work proactively with industry is the Pollution Prevention

Guide (PPG). This document is described as being a cut-down and simplified version of the ARC's Environmental Operations Plan (EOP), which is now more easily read and understood by industrial site operators. The document is split into modular form (as was the EOP) covering the following:

- drainage
- spills
- air
- transport
- storage and handling
- housekeeping.

While still in draft form, the PPG was trialled with 10 companies that undertake industrial activities and that hold discharge consents, selected by the ECan Compliance Monitoring section. Sites were audited prior to receiving the PPG and then again after they had a chance to fill it out and implement any necessary changes to their operations. Feedback received from the companies involved was very positive and few further changes were required to the PPG prior to final publication in June 2003.

The PPG enables a site operator to develop an environmental management plan for their site either online or in hardcopy format which is a significant advance on the EOP.

3.2.2 Pollution prevention posters

As an adjunct to the PPG, ECan have produced a series of simple but informative posters to provide to industry, advising of the sort of issues that commonly arise on industrial sites and how to deal with them. The posters are available on line, are provided to site operators who are audited proactively or are being audited as part of consent monitoring, and are used as an educational tool when pollution complaints are being identified and remedied. (The ARC took a similar approach and provided posters and a stormwater stencil "Tip no waste – Rainwater only" as a part of the EOP).

Posters have been produced for the following issues:

- cleaning
- hazardous chemicals
- materials handling
- oil
- spill station
- spills – contain and clean-up safely
- trade waste
- waste storage
- wrong connections (sewage and stormwater).

3.2.3 Action sheets

ECan have produced a series of "Action Sheets" for a variety of industrial waste generating activities. These sheets carry a similar theme to the 'Pollution Fact' sheets produced by the ARC, carrying a simple message and providing alternative options. Like the pollution prevention posters, action sheets are available on line, are provided to site operators who are audited proactively or are being audited as part of consent monitoring, or are used as an educational tool when pollution complaints are being identified and remedied.

Action sheets have been developed for the following issues:

- air emissions
- concrete cutting
- handling materials
- housekeeping
- site drainage

- spill procedures
- spill station
- stored materials
- vehicle washing.

Further sheets will be developed as issues are identified and solutions determined.

3.2.4 Small spills training course

In recognition of the lack of industry awareness and preparedness regarding hazardous substance spill management ECan have developed a small spills training course. This course can either be undertaken on-line or downloaded in hard copy format. It is a relatively short and simple training session aimed at raising awareness and changing behaviour amongst employees about the dangers of hazardous substance spills and how to deal with them appropriately. ECan officers are available to advise operators coach them through the course if any issues requiring clarification arise.

3.2.5 Proactive trials with ECan tenants

The ECan Environment Quality Section in consultation with the Property Department contracted a consultant to work with 21 companies that are leaseholders of ECan land. Each company is audited and then coached through the modules of the PPG relevant to their business. The company is then provided with an action plan which addresses all of the issues identified during the visit and given 6 – 12 months to implement the necessary changes.

This initiative should be adopted by all statutory agencies to ensure that they have their own house in order as well as requiring other businesses to clean up their act. Suitable targets for this approach include, departments such as parks, and biosecurity, all contractors like cleaners and painters undertaking work on behalf of the council, and all service providers such as printers or waste disposal companies.

3.2.6 Staffing

Budget amendments within ECan have been proposed to raise the number of dedicated staff undertaking proactive auditing from 3 to 4 in the 07/08 financial year. It is estimated that a team of this size will be able to proactively audit all of the Canterbury industrial sites in 7-10 years, which is considered a practicable timeframe.

The Compliance Monitoring industrial team have also been using the PPG with major consent holders. Unfortunately work commitments with non-compliance issues has resulted in less proactive work as been completed than intended. This is consistent with the findings of the ARC where staff have mixed portfolios, especially where there are statutory deadlines to meet.

3.3 Greater Wellington Regional Council – Take charge programme

The Greater Wellington Regional Council (GWRC) has a number of initiatives aimed at educating the community and business about stormwater contamination (Howard Markland pers. comm.). These initiatives range from targeted industry programmes (area and sector basis), to the trial delegation of stormwater enforcement powers to Hutt City Council trade waste officers and community water monitoring programmes.

The GWRC pollution prevention programme ‘Take Charge’ operated by GWRC is part of their Sustainable Business Initiatives programme. The “Take Charge” programme is similar to both ECan and ARC approaches in that it seeks to provide simple practical advice to site operators about the common problems that occur on industrial sites leading to stormwater contamination.

3.3.1 Online checklist

The GWRC programme invites industrial site operators to fill out a simple checklist (included in Appendix 8) to see if they need to get further involved in 'Take Charge'. The quick checklist is a 1 page format asking a series of questions covering all the basic issues commonly causing stormwater pollution on industrial sites. In summary it asks site operators if they:

- have a sealed yard draining to a stormwater grate
- use or store chemicals or bulk products
- store waste oil, solid waste or empty drums outdoors
- wash down vehicles products or machinery
- have a waste skip for leftover materials exposed to rain
- need or want to develop environmental management or emergency response procedures
- want to assess compliance with GWRC regional rules for industry.

The GWRC web site details the philosophy behind the Take Charge programme as follows:
"Take Charge seeks to help businesses to operate in a more sustainable manner, by assisting operators to identify pollution problems and resolve them before they get out of hand and also providing options for dealing with wastes, recycling, energy efficiency, air discharges, or contamination. GWRC auditors also point out any legal issues of an environmental nature that businesses may need to address.

GWRC offers a free auditing and environmental advisory service on request via their pollution control team. The pollution control team are considered best placed to provide professional advice to small businesses. GWRC's aim is to develop workable solutions to environmental problems with the business concerned and not to overload them with proposals that are beyond their means or capability."

3.3.2 Industrial sector based audits

GWRC has a proactive sector based programme similar to that run by ECan and the ARC whereby industries are proactively audited on a sector-by-sector basis. Industry sectors targeted tend to be those with predominantly small to medium sized businesses. Information GWRC committee reports indicated that Quarries (10), Service Stations (132) and Motor Vehicle Workshops (115) were the major sectors targeted to date. Like the other GRWC programmes the intention is to identify problems and work with industry to implement practical solutions. Where council requires changes to stop current pollution problems further action, including enforcement is pursued.

3.3.3 Industrial area based audits

In addition to the sector based approach GWRC have also been targeting areas where high risk industries are concentrated and/or where significant degradation of receiving water bodies has historically occurred. GWRC reports show that two main industrial areas have been targeted to date, the 'Gracefield' industrial area in Lower Hutt (93 sites audited) and the industrial area draining into 'Drain 6' in Paraparaumu (92 sites audited). Like the ARC's Industrial area blitz programme these areas were chosen due to the concentration of industrial sites and/or the history of stormwater abuse by industry.

The format of the industrial area auditing projects are very similar to the ARC's Area Blitz programme discussed in Section 3.1.5 and therefore it will not be elaborated on further here.

3.3.4 Delegation of enforcement powers

GWRC have long been concerned about the efficacy of two agencies (themselves and TAs) both dealing with contaminant discharges into stormwater systems. For a variety

of reasons they have concluded that the most effective and efficient way of dealing with common, small-scale, industrial site discharges is through TA enforcement officers (in this case Hutt City Council (Hutt CC) trade waste inspectors). There was a considerable amount of frustration on the part of Hutt CC regarding a perceived lack of options for dealing with businesses discharging contaminants into the Hutt CC stormwater network without authorisation. This concern had become more acute with the processing of comprehensive stormwater discharge consents with conditions specifying discharge quality which the Hutt CC was expected to comply with. This seems to mirror the situation that has emerged between Hamilton City Council and EW quite closely.

A table showing ten potential options that GWRC considered that would allow territorial authorities to exercise control over contaminant discharges into their stormwater networks is provided in Appendix 9. When evaluating these options GWRC found that there were two key differentiating factors. Firstly there is the complexity of the administrative process required to effect a change, particularly where formal community consultation under the LGA or ministerial involvement was required. Secondly, there is the ability to balance tight control over the day to day operational actions of TA officers and retaining legal liability if problems arose.

A review of regional councils showed that most had delegated functions to their TAs in some form or other (most often in relation to the CMA). However, no precedent could be found for delegating enforcement powers for contaminant discharges into stormwater networks, although several councils indicated they were considering options, such as introducing a bylaw (the GWRC report states that they have legal advice that "*this was not a viable option"*).

The option chosen by GWRC was the delegation of enforcement powers under section 34A (2) of the RMA. GWRC gained some comfort from the extent to which delegation was already being employed around New Zealand and they were advised that legally they could proceed without a formal consultative process or ministerial involvement.

(Note: regardless of this advice the author would have expected the LTCCP processes of both GWRC and the relevant TA or the use of the Special Consultative Process (S83) of the LGA, would have been a sensible approach to engaging with the community about implementing such a change).

GWRC undertook consultation with elected members via committee agenda items and received officer feedback via regional officer forums. The proposal was strongly supported and a pilot trial application of the method was deemed an ideal way forward. A review of potential project partners revealed that Hutt CC was the most promising by virtue of the number of high risk industrial sites in their area, good stormwater quality data, capable enforcement officers and strong political support.

Therefore, for a one year period, GWRC are delegating their enforcement powers to HCC trade waste officers, to allow them to follow up incidents of illegal contaminant discharges at industrial sites onto land where they may get into stormwater.

This delegation is to be exercised via section 34A(2) of the Resource Management Act 1991. Enforcement powers covered in this delegation are limited to those described in section 15(1)(b) of the RMA. The power delegated is the ability to undertake investigations and necessary enforcement action for breaches of rules of the Regional Plan for Discharges to Land, specifically Rule 1(a), the discharge of uncontaminated stormwater, and Rule 3(1) the discharge of stormwater containing specified minor contaminants.

This initiative between GWRC and HCC appears to provide a great opportunity for many regional councils around the country to enter into collaborative agreements to undertake proactive and reactive pollution programmes. The situation that led to this

approach has very strong parallels with Hamilton City Council and EW and the frustration each is experiencing with the position adopted by the other.

3.3.5 Community monitoring

Like a number of other regional councils (including EW) GWRC support communities taking action to protect and enhance the waterways of the Wellington region. 'Take Care' provides financial support and specialist assistance for community groups and schools wanting to look after the aquatic environment. There are opportunities for individuals, groups and businesses to work on environmental projects that contribute to the health and restoration of:

- rivers and streams
- wetlands and lakes
- coastal environments.

In addition GW runs a very popular schools education programme 'Take Action' which has much in common with similar programmes (e.g. Enviroschools) run in the Waikato and elsewhere.

4 Programme component options analysis - pros and cons

4.1 Overall staff time requirements

Time requirements for the various components of the programme options trialled by the ARC and others, are highly variable and depend on:

- size (or scope/breadth) of the project being undertaken
- preparedness due to the effort put into generating background information
- the level of auditor (officer) experience
- the thoroughness of the audit
- the willingness of the industry to cooperate during the audit
- implement change once problems are identified (without or with enforcement).

The amount of officer time required for preparatory groundwork, liaison with partner agencies, and communications (internal and external) should not be underestimated. Scoping of the size of the problem alone can require several days of field work visiting the area and assessing the range of businesses operating there. The target catchment and area blitz work that is linked to schools and/or community groups requires a considerable amount of preparatory work and liaison in the weeks leading up to the actual auditing work. One component that is absolutely essential is ensuring that political representatives for the catchment being surveyed are aware of the proposal well beforehand and preferably involved in any pre-assessment media releases.

The most detailed information on the resource requirements for site auditing is available for the ARC's IP^3 programme where proactive site assessments typically identified 2-5 actual discharges and 4-8 potential issues at each site visited. Site audits and subsequent follow up at high-risk sites typically required 8 hours of officer time and officers would typically audit around 200 sites per year. However, it is important to remember that these sites are prioritised as high-risk due to the pollution problems historically encountered with that that type of industry. Smaller sites with more standardised layout and operation, such as service stations, can be audited much more quickly; therefore, once the highest risk industries have been audited the completion of industry sectors should accelerate.

Appendix 5 provides information on the numbers and types of sites audited and actual and potential problems identified by different ARC target catchment and area blitz

programmes. These projects have greater diversity of industry types than the IP3 programme, including a high proportion of medium and low risk sites and as expected they identified fewer actual or potential discharges with lesser impacts. Site audits and provision of educational material to low and moderate risk industries can take as little as 30 minutes.

4.2 Pros and cons assessments

Each of the programme components assessed below has been rated on the ability of the programme to achieve the following criteria: (i.e. one ★ for each criterion met)

- ★ practicality with limited resources
- ★ ability to deal with the highest-risk activities first
- ★ value for ratepayer dollars
- ★ public support
- ★ ability to focus on stormwater contamination and not be deflected to other issues.

4.2.1 Target catchments

A qualitative pros and cons analysis of a target "whole of catchment" project is summarised in the table below.

Pros	Cons
Assesses all sites and activities within a catchment regardless of risk so a holistic snap-shot is obtained	Lack of prioritisation results in scarce staff resources spent on sites that are very low/no risk
Provides for water quality/biological effects to be assessed and identified	Additional costs of sampling and analysis deflects effort from auditing high risk sites
Officer presence in an area is sufficient to prompt some operators to undertake work they know is needed	Episodic nature of discharges, cumulative degradation effects and linkage to rainfall makes stream water quality analysis an inaccurate measure of problems
Can enable community involvement in developing the programme	Can be deflected away from primary objective by strong local advocates for other issues
Holistic view of dealing with problems is viewed more positively by the community particularly for a waterway known to be abused and considered significantly degraded	Community component adds a significant extra lead-in time for consultation and development of an acceptable plan
Community less tolerant to poor site management practices and know who to call to voice concerns in future	Potential extra workload caused by eager community members reporting things that turn out not to be pollution (e.g. pine pollen)
Opportunity for community and neighbouring industry pressure on bad site operators	Industry operators elsewhere in the region not required to comply at the same time (not even-playing-field)
Provides for schools involvement (e.g. stencilling drains – Enviroschools programme)	Negative response from the catchment chosen - Why pick on us?
Opportunity for positive media exposure and political support	Programme could get deflected by lobby groups

Over all this type of survey rates highly on community involvement and buy-in but can be overtaken by wider community interests. Target catchment surveys are very resource hungry particularly as catchment size increases and unless targeted at particularly degraded waterways are unlikely to provide good value for ratepayer investment.

Overall rating ★★☆☆☆

4.2.2 Industrial area blitz (used by both GWRC and ARC)

A qualitative pros and cons analysis of a target industrial area blitz project is summarised in the table below.

Pros	Cons
Assesses all industrial sites within an industrial area regardless of risk	Lack of prioritisation results in scarce staff resources spent on sites that are low risk
All sites are visited within a short time frame and cleaned-up	Industry operators elsewhere in the region not required to comply at the same time (not even-playing-field)
Programme viewed positively by the community particularly for an area considered degraded due to industrial mismanagement	Difficult to demonstrate an improvement in water quality for effort expended
Community less tolerant to poor site management practices and know who to call to voice concerns in future	Slippage over time as no "enduring relationship" established between the regulator and industry
Opportunity for community and neighbouring industry pressure on bad site operators	Resource intensive in terms of organisation and information gathering prior to surveying
Provides for schools involvement (e.g. stencilling drains – Enviroschools programme)	Negative response from the industrial area chosen - Why picking on us?
Opportunity for positive media exposure and political support	
Officer presence in an area is sufficient to prompt some operators to undertake work they know is needed	

Overall this type of survey still gets community support for sorting out polluting industries. However, considerable resources are still required to set up the project and this increases as area surveyed increases. Unless targeted at areas with high risk industries and/or particularly degraded waterways these surveys may not provide the best value for ratepayer investment.

Overall rating ★★★☆☆

4.2.3 Sector based IP3 (used by Ecan, GWRC and ARC)

A qualitative pros and cons analysis of a targeted high-risk industrial sector project is summarised in the table below.

Pros	Cons
Highest risk industries in the region identified and audited resulting in staff resources focussed on best bang-for-the-buck	Negative response from the industry chosen - Why pick on us?
All sites in the region are visited within a short time frame and cleaned-up providing even-playing-field	Slippage over time unless an "enduring relationship" established between the regulator and industry
Programme viewed positively by the community particularly for a "dirty" industry	Resource intensive in terms of organisation and information gathering prior to surveying
Community/peers less tolerant to bad operators and know who to call to voice concerns in future	No opportunity for community/schools involvement as sites are high-risk
Opportunity for positive media exposure and	Improvement of water quality on a receiving water body is difficult show except in

Pros	Cons
political support	extreme cases due to cumulative impacts from other sites.
Opportunity for an industry "champion" to be identified who can support the programme from within the industry	Antagonistic response from some site operators who do not like being caught-out
Targeted education material can be produced specific to industry, contaminants and solutions leading to better understanding of the industry by council	
Opportunity to develop industry agreed CoP, best practice guide or voluntary accord	
Spending time dealing with sites carefully and thoroughly on a proactive basis engenders better relationships with site operators	

Overall this type of survey still gets community support for sorting out industries that are regarded as "dirty". Considerable resources are still required to set up the project; however targeted education material, CoP's and other practice guides, will be invaluable for future dealings with this and industries with similar processes and/or contaminants in future. Targeting high risk industries provides good value for ratepayer investment however the impact on water quality is difficult to determine due to the cumulative impacts of other nearby industries that are yet to be assessed.

Overall rating ★★★★★

4.2.4 Sector based industry group project (IGP) (used by ECan, GWRC and ARC)

A qualitative pros and cons analysis of a targeted industrial group are summarised in the table below.

Pros	Cons
Industry causing problems is targeted resulting in staff resources focussed on best bang-for-the-buck	Negative response from the industry chosen - Why picking on us?
All sites in the region are visited within a short time frame and cleaned-up providing even-playing-field	Slippage over time unless an "enduring relationship" established between the regulator and industry
Simpler problems and solutions mean wise use of resources buy mailing out information prior to auditing	Resource intensive in terms of organisation and information gathering prior to surveying
Community/peers le ss tolerant to bad operators and know who to call to voice concerns in future	No opportunity for community/schools involvement as sites are spread throughout the region
Opportunity for positive media exposure and political support and raising awareness amongst clients for the industry	Improvement of water quality on a receiving water body is difficult show as impacts are cumulative and industries are often mobile.
Targeted education material can be produced specific to industry, contaminants and solutions leading to better understanding of the industry by council	Antagonistic response from some site operators who do not like being caught-out

Pros	Cons
Opportunity to develop industry agreed CoP, best practice guide or voluntary accord	

Overall this type of survey still gets community support for sorting out industries that are regarded as "dirty"; however, there is little opportunity for community involvement. Considerable resources are still required to set up the project; however, targeted education material, CoP and other practice guides, will be invaluable for future dealings with this industry. Targeting industries that create a large number of small problems provides good value for ratepayer investment; however, the impact on water quality is impossible to determine for any one waterway due to the transitory nature of the activity and its effects.

Overall rating ★★★★☆

4.2.5 Hot-spot surveys (ARC)

A qualitative pros and cons analysis of a targeted industrial area waterway assessment (Hot-spot) survey are summarised in the table below.

Pros	Cons
Waterway with history of abuse is targeted resulting in staff resources focussed on best bang-for-the-buck	A "clean" run indicates that scarce resources have been wasted
Real data obtained on problems in waterways that would not have been reported	Deflects scarce resources away from sorting out the highest risk activities as it only identifies not solves problems
Community support as waterway viewed as degraded is seen as getting attention	Improvement of water quality on a receiving water body is difficult show as impacts are often cumulative
Simplicity of approach means that community groups/individuals can adopt the waterway and people know who to call to voice concerns in future	Antagonistic response from some site operators who do not like being caught-out
Simplicity of the programme means a large number of locations can be assessed in a relatively short time	
Episodic nature of pollution events (often occur as a slug of contamination) means an event can be easily missed	
Officer presence in an area is sufficient to prompt some operators to undertake work they know is needed.	

Overall this type of survey still gets community support for locating problems in degraded waterways and there is opportunity for community/individual involvement once sites are established. Resources are still required to run the programme, particularly the tracing of the problem cause and follow-up. Targeting waterways with concentrations of industries, a history of problems and degraded water quality provides a good "bang-for-the-bucks"; however, where resources are scarce it is of lower priority.

Overall rating ★★★☆☆

Pollution prevention guide

The PPG is a revised and improved version of the ARC EOP, it was tailored for the situation that exists in Canterbury and may need further amendment for use in the Waikato. A qualitative pros and cons analysis of the use of a PPG to assist industry is summarised in the table below.

Pros	Cons
It can be copied from existing documents from ECan saving EW ratepayers	Industry should develop it's own material rather than rely on EW ratepayer funding to do it for them
It has already proven its value in two other jurisdictions	
EW will ensure that Waikato specific environmental requirements are emphasised in the document	
A consistent approach will be employed by industry	
Environmental management requirements will be de-mystified and simplified	
Operators will not be able to claim that guidance has not been available.	
Lower consultants costs for industry due to standard templates	

This self-help tool ranks highly for providing specific, practical information on site management practices to assist industry. While ratepayer funds are used in its development and deployment it will significantly reduce the amount of time council time spent with industrial site operators, dealing with their environmental managers or consultants. Experience with the PPG in Canterbury shows that auditor assistance through online training courses and on-site coaching ensures that the document is used effectively.

Overall rating is ★★★★☆

Online spills course

ECan provide an internet accessible spills course that has a simple easy to follow format aimed at small to medium business operators and staff. As a generic tool online training courses would be valuable for all facets of industrial site management. A qualitative pros and cons analysis of online courses to assist industry is summarised in the table below.

Pros	Cons
It can be copied from existing documents from ECan saving EW ratepayers	Industry should develop it's own material rather than rely on EW ratepayer funding to do it for them
A consistent approach will be employed by industry	No way of knowing whether the course was accessed, understood or implemented
Environmental management requirements will be de-mystified and simplified	
Operators will not be able to claim that guidance has not been available	

Pros	Cons
Lower consultants costs for industry due to standard templates and information on-line	
Reduction in officer time explaining spill requirements	

This self-help tool ranks highly for providing specific, practical information on site management practices to assist industry. While ratepayer funds are used in its development and deployment it will significantly reduce the amount of time council time spent with industrial site operators, dealing with their environmental managers or consultants. One flaw is the lack of feedback on whether the information is accessed or used.

The overall rating is ★★★★☆

Transfer of enforcement powers

The GWRC/Hutt CC trial transfer of enforcement powers under s34A of the RMA, for industrial site discharges to land where they may get into water via municipal stormwater reticulation system, is an opportunity to ensure industrial site discharges are appropriately managed. A qualitative pros and cons analysis of the use of transfer of enforcement powers from regional council to TA is summarised in the table below.

Pros	Cons
It can be copied from trial conducted by GWRC and Hutt CC and the 'bugs' should be identified and resolved by this process	Debate about responsibility for industrial site stormwater discharge quality is not yet resolved in the Waikato.
More TA officer resource on the ground to deal with problems that may not be a priority for the regional council	Consistency of approach difficult to achieve and maintain
Supports EW desire that TAs deal with industrial site discharges that enter the TA stormwater network	Not all TAs willing to accept responsibility or having sufficient appropriately trained officers
Likely to be useful for both proactive and response activities by TA officers	
Allows closer integration with TA land use planning functions	
Does not prevent joint initiatives or regional council action under the RMA with site operators	
Can be implemented relatively quickly without the need for protracted consultation or ministerial approval (according to GWRC information)	

Central to utilising this option is acceptance of joint TA and regional council responsibility for the activities of industrial site operators which result in contaminant discharges that get into municipal stormwater systems. The extent to which this transfer could be used to underpin proactive auditing would also need to be further explored. The capability and willingness of TA's to undertake the assessments would need to be assured before proceeding, however this could be managed via a MoU (see Appendix 9 for GWRC and Hutt CC model).

The overall rating is ★★★★☆

5 Prioritisation within each programme component

Regardless of the programme component that is being considered a ranking or prioritisation process is needed in order to streamline effort to the available resources. The following section provides prioritisation methods which have been used by the ARC and which fit in the Auckland context but may need to be modified for the Waikato Region and/or for various Territorial Authority situations.

Target Catchment surveys have not been included in this analysis due to the low rating achieved in the pros and cons analysis in Section 4. As such they are not recommended to be part of a comprehensive ISP^3 programme for the Waikato.

5.1 IP^3 target industry sectors

In order to determine a priority sequence for proactively auditing industrial activities some form of ranking must be undertaken. There are a number of industry risk ranking systems that could be used from NZ and overseas, and Appendix 1 provides a comparison between the following:

- ARC's Proposed Auckland Regional Plan: Air, Land and Water - Schedule 3: High Risk Industrial or Trade Activities
- EW's Proposed Waikato Regional Plan: Water Module: Section 3.5.12 High Risk Facilities
- MfE's Hazardous Activities and Industries List.

These three systems have taken similar approaches; however; the ARC system delves into considerably greater detail about the types of industrial activities that cause problems. This approach has both advantages and disadvantages, including:

- the main advantage is clarity about the type of industrial activity that is considered high risk in the programme
- the down-side is the risk of omitting some high risk activity in compiling the list which would be difficult to bring in later, particularly if the information is included into statutory documents.

The more generic, broad-brush, approach adopted by EW ensures that the council can more easily argue with any industry about whether they are intended to be captured by a category or not.

For the process determining which industries should be targeted first, a risk-based classification method is recommended based upon two main criteria:

- the industry type, which determines:
  - what are the "signature" contaminants associated with that industry type based on NZ and overseas information
  - the likelihood that contaminants will be released due to the nature of the activity and it's typical operational controls based on NZ and overseas pollution profile information
- the size of the operation (assuming larger scale of the operation increases risk).

Additional weighting factors can be included to provide clearer differences in terms of priority, including:

- the number of sites in the region or area relative to council resources
- whether the industry has been dealt with before regionally;
- the availability of industry specific education resources, CoP etc; and
- the presence of an industry association.

While these factors do not influence the potential environmental impact of individual sites they do affect the practicability of dealing with the industry and likely timeframes to effect change and therefore collective regional environmental effects.

5.2 Industry group projects

Selection of the most important industry groups to target can be best described by applying a series of filters based on the factors that describe why IGPs are required. A review of pollution complaints relating to industrial activities over the previous five years will generally enable a ranking of activities which fit the following criteria, in that they:

- account for a large proportion of pollution complaints
- produce wastewater which is often highly visible running off a site or in a water body (foams or discoloration) or odour (chlorine)
- are often mobile so they may change location often
- are usually small operations with owner/operator or a few staff
- have a large number of them operating throughout the city, district or region
- have wastewater which may/or may not be directly toxic but often has aesthetic and cumulative impacts
- have operational problems are generally relatively simple, pragmatic and inexpensive to solve.

Both EW and Hamilton City Council have indicated a concern for these types of industries. For example EW has included truck and car wash facilities, bakeries and commercial laundries and mechanical workshops in their PWRP High Risk Facilities list. HCC trade waste officers are similarly concerned about vehicle wash water and have recently embarked on a proactive programme of auditing each site and encouraging them to connect their washing facilities to the sanitary sewer, although many currently discharge to stormwater.

5.3 Hot-spot survey locations

Hot-spot surveys may be chosen as a way of obtaining data on whether discharges into water bodies draining industrial areas are reported or not. As stated in section 4.2.5 hot spot survey locations need to be based upon one or more of the following factors:

- the catchment drains a known or suspected problem industrial area (high numbers of high-risk sites)
- they have a history of pollution complaints
- there is evidence of long term abuse of the waterway by industry (water/sediment quality)
- there is a convenient location for the assessment.

Hot-spot sites should ideally not require a great deal of time to gain access and officers should be able to tell ‘at-a-glance’ if further assessment is warranted. Officers (TA and/or regional council) with a good working knowledge of the urban industrial waterways should be able to determine some pressure points where observations can be regularly made with a high likelihood of success. Ideally a series of these locations would be formed together in an efficient configuration to form a ‘run’. However, it may also be that a number of EW or TA staff will pass the relevant locations during a day as a part of other council business and can make quick assessments. The more frequently sites can be checked the better. It is important to remember that not finding a problem is actually a good result and that long periods may pass before a ‘pollution event’ occurs.

Looking to the future this is the sort of circumstance where a webcam arrangement could provide the opportunity for a visual on-line assessment. Such systems are now

relatively affordable and it may be practical to provide a secure location within a nearby site to avoid theft or vandalism.

5.4 Industrial area blitzes

Area blitzes form a particular niche in dealing with industrial stormwater pollution complementing targeted industry sector project and IGPs by focussing on a cluster of industrial sites. The Industrial Area Blitz approach would seem to be particularly well suited to the Waikato Region with clusters of industries associated with rural townships.

Prioritisation of areas for a blitz should rely on a number of criteria including:

- areas with ongoing water pollution problems (particularly un-traced);
- Intensive areas of 'high risk' industrial practices that are identified by other surveys (only relevant to Hamilton city)
- clusters of industrial activity in outlying townships
- TA areas where there is strong support for the ISP[3] programme
- areas where TAs have the willingness and capability to assist with or undertake the industrial site audits
- clusters of industrial sites serviced by a common piped stormwater network that can be easily surveyed as a block.

Based on the information available the Hamilton city industrial area around Frankton would appear to fulfil many of the criteria listed above.

6 Tools

The programmes trialled by GWRC, ECan and ARC have been described and evaluated in Sections 3 and 4. Based on this information a package of options can be chosen that will best suit the needs of the Waikato Region. All of the programmes demonstrate that the most practical method of addressing the problem of poor industrial site management in a timely manner, involves the proactive auditing of the industrial activities or areas that present the greatest risk to the environment. Such an auditing programme needs to be carried out in concert with an on-going education programme and a firm no-nonsense regulatory approach based on the full use of statutory tools available under the RMA.

A number of education tools and resources have been developed by ECan, GWRC and ARC, to provide assistance or guidance to industry in preventing pollution and improving environmental performance at specific sites.

These tools can be separated into those which assist the auditing team and those which will be used by the site owner/operator specifically.

6.1 Auditors

6.1.1 Standardised site audit forms

The development of standardized site assessment (audit) forms will help ensure that auditing staff are collecting comparable information and taking a consistent approach. An example of an ARC small site audit form is provided in Appendix 6. This type of form is also used by ECan and GWRC and with some modification to suit the Waikato situation, could be used as a standard approach that would suffice for most proactive industrial site audits.

Thinking toward the future, the development of hand-held computer devices for information gathering is becoming more practical. Therefore, if the forms can be loaded on to a handheld device, the information would only need to be entered once out in the field and then downloaded to the master database once the officer returns to

base. Taranaki Regional Council already uses this sort of system for compliance data collection.

6.1.2 Environmental performance rating (EPR)

The EPR is a technique whereby the environmental performance of a site can be assessed and given a grading using a standard set of criteria. The EPR process uses the information collected whilst the officer is undertaking a site audit and produces a rating of site performance for pollution risk, site housekeeping and spill preparedness.

Pollution Risk is assessed using the extent to which environmentally hazardous substances (EHS) are used or stored on a site and their potential impact, as follows:

Small quantity of EHS of low toxicity = 1;

Large quantity of EHS of low toxicity = 3;

Small quantity of EHS of high toxicity = 3;

Large quantity of EHS of high toxicity = 10.

Housekeeping describes the manner in which EHSs are stored, used or transported within a site that may lead to stormwater contamination, including; the raw materials, products, wastes, used containers and equipment. Each category gets a score of 0 for good or 1 for poor and these are aggregated for a combined total which is divided by 4, as follows:

A	Storage practices			
	i) storage (undercover or exposed)	0 or 1	=	
	ii) bunding (incomplete or inappropriate)	0 or 1	=	
	iii) spillages (leaks)	0 or 1	=	
	iv) tracking (e.g. on vehicle tires)	0 or 1	=	
	subtotal			

B	Handling of EHS – evidence of spillages during:			
	i) unloading/loading	0 or 1	=	
	ii) decanting	0 or 1	=	
	iii) use in production	0 or 1	=	
	iv) movement around the site	0 or 1	=	
	subtotal			

C	Production Process – poor management practices			
	i) Spillage during manufacture	0 or 1	=	
	ii) Waste clean-up	0 or 1	=	
	iii) Air emissions (e.g. dust or fumes)	0 or 1	=	
	iv) Exposure to weather	0 or 1	=	
	subtotal			

D Washwater Production			
i) Vehicles	0 or 1	=	
ii) Equipment (plant)	0 or 1	=	
iii) Products or raw materials	0 or 1	=	
iv) Containers	0 or 1	=	
subtotal			

Housekeeping = (A + B +C + D) /4

Spill Planning measures the extent to which an industrial operation is prepared to deal with EHS discharges due to spills, leaks or accidents like containers being punctured or burst. Preparedness is a measure of whether the site has:

- an environmental management plan specific to the site and appropriate for the activity;
- appropriate spill containment and clean-up equipment; and
- staff that are trained in spill management appropriate to the site and EHS.

The degree of preparedness for spill management is rated as follows:

A. Appropriate; site environmental management plan, spill equipment; and staff training = 1;

B. Inadequate environmental management plan, or spill equipment, or staff training = 2;

C. No environmental management plan, equipment, or staff training = 3.

The three ratings are then multiplied together as follows:

EPR = Pollution Risk x Housekeeping x Spill Planning

The higher the number is the worse the industrial site operator's environmental performance, therefore in the worst case scenario there would be (10 x 4 x 3 = 120).

This results in one overall number for an industrial site that helps to provide information as follows:

- Specific problem areas for improvement can be seen at a glance for a site or industry;
- Individual site performance can be compared at a glance over time (first audit vs. subsequent);
- The sites in an area can be aggregated to provide an overall score for an area blitz (and show subsequent improvements over time);
- An industrial sector can be aggregated and performance and improvement compared;
- The sites in a catchment can be aggregated and performance and improvement compared.

An example of the EPR is provided on the site auditing form included in Appendix 6. This system can still give variable results depending on the experience of the officer undertaking the audit.

6.1.3 Database

The information collected as a part of each proactive site audit will be an invaluable database for the ISP[3] programme over time and other teams within EW and the TAs. Some TAs already have extensive databases listing the industry types within their Cities or Districts, such as Hamilton City Council. The HCC database was compiled

with the objective of identifying potentially contaminated land, therefore much of the background data, such as location and activity description is present. However, it was not set-up to collect site operational information as would be compiled during an audit and therefore extra fields covering issues like chemical used or stored on site, site management practices and spill preparedness, would need to be added.

Once this information is gathered it becomes a valuable source of data for EW working with industrial sectors, after several audits are completed common problems are identified, resulting in more targeted educational information. Depending on the degree of information compiled it can be used for workflow management, industry sector auditing time tracking and presentation of summary information for briefing of senior management, councillor briefings and media communications.

The information collected is also valuable for other areas of EW and TA interest such as: cleaner production, contaminated land, land use compliance and discharge consent compliance (air and stormwater). It is also valuable for pollution response activities as officers can rapidly check if a particular pollutant type found in a waterway is used or stored at any of the industrial sites in a particular area, narrowing search areas and time requirements.

There are a number of other databases that have been developed on GWRC, ECan and ARC (and no doubt other regional councils or TAs) that could be used; however, the amount of data already accumulated on the HCC database suggests that modification may be the most sensible way forward.

6.1.4 Drainage maps

ARC experience has shown that having stormwater drainage infrastructure maps downloaded onto a laptop and out in the field is incredibly valuable. TAs, such as HCC, have GIS maps showing the public stormwater network infrastructure, although they may not have all of the systems identified on private sites. In terms of working out where discharges will go once they exit sites, online drainage maps are an incredibly valuable time-saving device.

6.1.5 Vehicles and sampling equipment

EW already has fully equipped pollution response vehicles with all of the necessary investigative equipment that would be needed for proactive site auditing. It may be useful to get an inventory from some of the other regional councils (GWRC, ECan and ARC) with proactive programmes to find out what equipment the find necessary (and unnecessary) to streamline equipment requirements.

6.1.6 Pollution response and H&S manual

A number of regional councils (e.g. Northland and Auckland regional councils) have developed generic pollution response manuals that outline all of the ‘typical’ situations that an officer might encounter when dealing with an industrial site and some strategies for dealing with them. Such a document is a valuable training aid when developing site auditing skills. In addition to the general information vital Health and Safety information should also be provided as many industrial site activities present a significant risk to site auditors.

6.2 Industry specifically

6.2.1 A pollution prevention guide (PPG)

A generic PPG, the Environmental Operations Plan (EOP) was developed by the ARC as a “Do-it-yourself” environmental checklist for a clean, safe and profitable business following on from experienced gained as part of the Manukau Harbour Action Plan.

The ARC promoted the EOP for several years and distributed more than 1,000 copies free of charge to businesses and then surveyed businesses to find out whether they found it valuable or not and what prevented the EOP from being more valuable to them. Site operators responded that:

- they found the document size to daunting which made them reluctant to devote the necessary time to completing it when they have a business to run
- they found that it contained a lot of information that was irrelevant to some sites making some parts appear to be waste of time
- operators needed follow-up from the ARC and individual assistance to clarify queries
- the document came across as very bureaucratic and legalistic.

Where time was invested coaching individual sits through the document it was seen as valuable.

ECan has produced a cut-down version of the EOP called the "Pollution Prevention Guide" based on the concerns raised about the EOP in Auckland. This document is well regarded by industry in the Canterbury region; however, detailed follow-up by council staff is required to ensure that the document is correctly filled out and changes to management practices identified through this process are employed. As discussed earlier GWRC has a similar document and associated programme: 'Taking Charge'.

6.2.2 Pollution fact sheets

A number of regional councils, including ECan, GWRC and ARC have developed fact sheets about specific common polluting activities to support their proactive and pollution response programmes. These fact sheets have generally been used as activity specific pollution prevention guidance sent to industrial sites following a pollution incident or site assessment visit by pollution prevention staff.

Fact sheets are particularly useful for low or moderate risk industries where a number of activities with potential to pollute are being carried out. They are regularly employed as part of Industry Group Projects as part of mail-outs or handing out to low or moderate risk sites as part of an Industrial Area Blitz. They provide targeted, relevant information for the activity which is specific and to the point and can be contained on several A4 sheets. The web sites for the ARC, ECan and GWRC all have lists of downloadable pollution fact sheets which could be easily modified for use in the Waikato.

6.2.3 Industry best practice guides and/or codes of practice

There are a number of industry specific pollution prevention guides that are available from overseas jurisdictions, in particular the New South Wales Environmental Protection Agency (NSWEPA). These guides will need to be amended to take account of the different legislative environment that exists in New Zealand generally and regarding statutory plan provisions in the Waikato region specifically.

In Auckland guidelines and/or Codes of Practice are being developed currently for the following industry sectors as the result of council and/or industry initiatives:

- boat or ship construction, repair or maintenance - Auckland Guideline for the Management of Environmental Risks from Boat Maintenance Activities
- scrap metal recycling (crushing, grinding, sorting or storage) – Pollution Prevention Best Practice Guide for Scrap Metal Processing Industries in the Auckland region
- metal plating, anodising or polishing and metal blasting or coating (excluding spray painting) – Pollution Prevention Best Practice Guide for Metal Finishing Industries in the Auckland region
- dry weather sewer overflow clean-up – Best Practice Guide developed in conjunction with Auckland wastewater network operators
- further guides are planned for the automotive dismantling and concrete product manufacturing sectors.

These guides have been or are being developed in collaboration with the individual industry sectors concerned generally through an industry association or joint working group. They outline common methods of operation and relevant source control best management practices and stormwater quality treatment for the specific 'signature' contaminants associated with the specific industry. It is important that the specific needs of the industry are taken into account when formulating stormwater treatment options as knowledge of the form and method of contaminant escape and mobilisation will be critical to deciding how best to control it.

For example, facilities that undertake boat maintenance activities can result in significant quantities of copper being entrained in stormwater from copper antifouling paint flakes and dust. Filtration of the material alone only removes the particulate fraction of the copper; however, using a sand filter, in combination with peat to adsorb the soluble copper, will result in efficient and effective treatment.

6.2.4 Environmental management plan guide - EMP Guide

ARC proactive industrial site auditing experience over the past 10 years has shown that site operators need to prepare a site specific environmental management plan (EMP). An EMP ensures that both the things that operators are doing well and problems identified with their solutions, are put into an implementation framework that means they will get done. The ARC's has included the requirement for high and moderate risk industrial site operators to prepare a site specific EMP into the rule framework in the Proposed Auckland Regional Plan: Air, Land and Water. In the absence of any generic guidance document on how an EMP should be prepared, site operators have been developing their own with the following consequences:

- a lot of officer time was taken liaising with the client or their consultant, to bring the EMP up to the necessary standard
- the client spent a lot of time and/or money unnecessarily
- a variable response was received from different officers
- everyone became frustrated with the amount of time required
- arguments arose over the adequacy of proposals particularly over the competence of consultants whose work was not of an acceptable standard to the ARC.

As a consequence the ARC commissioned the preparation of a generic EMP guide on how to prepare and use an environmental management plan for industrial and trade processes in the Auckland region. While it is being developed based on the requirements of the statutory regime in Auckland it will be readily modified for other jurisdictions (such as the Waikato).

6.2.5 Industry workshops and industry champions

As part of the Otara Lake Area blitz the ARC trialled the use of industry workshops to help site operators develop their own site EMP's in a non-threatening environment. In this case, an industrial site within the catchment hosted ARC officers and invited surrounding business to a lunch time seminar series about stormwater contamination issues. The ARC provided some food and a series of speakers on several key aspects of site stormwater management. Then site operators were invited to use ARC staff to coach them through any difficult issues they were having trouble with in terms of their site EMP. This approach will be much more successful when the generic EMP template is completed (as discussed above).

The concept of 'industry champions' is simply utilising passionate and enthusiastic individuals, who may or may not be leaders within their industry, who act as the facilitator between the statutory agency and the industry association or business group. The value of such people is that they are not regarded with the same level of suspicion as council staff are and they are much more able to talk in terms that the industry operators will understand. A good example of such a situation is the Scrap Metal Dealers Association of New Zealand, through their president Trevor Munroe. He has

worked tirelessly with the ARC and members of the association to come up with a workable Code of Practice that will meet operational needs and environmental concerns.

6.3 Conclusion

In combination the tools and resources outlined above will form a comprehensive and effective "toolkit " for industry working to prevent pollution and comply with the RMA and relevant regional and district plans. Each individual component of the toolkit should be made available through the relevant websites of EW and participating TAs.

7 Resource implications of ISP^3

There are a number of implications and "downstream" effects on the parties involved in, or affected by the implementation of the ISP^3, which are briefly discussed in the following section.

7.1 Proactive team resource requirements

The importance of providing sufficient resources to the ISP^3 project cannot be over-emphasised. By comparison the ARC, GWRC and ECan have all developed their programmes in a step-wise fashion providing proof of success of each programme component and staff resource before expanding. While this may be seen as a mechanism for maximising efficiency and effectiveness from a management perspective, it is an exercise in frustration for the officers involved. A step-wise approach means the resources available never seem to be sufficient to do a half-decent job and all parties want to know why things take so long to be resolved.

ECan, GWRC and ARC also started their programmes with proactive auditing staff imbedded within other operational units. This approach has repeatedly failed due to conflicting work pressures, particularly those with RMA statutory deadlines, demanding attention ahead of work that can be postponed.

The following section provides an estimate of resource requirements for the ISP^3 programme which can be scaled up or down depending on the final make-up of the programme.

7.1.1 Industrial sector based approach

ARC experience over many years has shown that on average high risk site assessments require 8 hours to complete including auditing time on-site, correspondence, follow-up audits, phone calls and record keeping etc. One experienced full time equivalent (FTE) officer (1560 hrs per year) can complete approximately 100 -150 high-risk site assessments per year. This has been expressed as a range because time requirements depend to a large degree on the difficulty of the industry concerned.

This estimate of officer auditing time does not account for the following:

- high level of industry liaison
- the preparation of additional industry specific information
- general industry education
- mentoring or coaching site operators through issues arising from development of their site specific environmental management plan
- any time required taking enforcement action.

These requirements will effectively lower the number of site assessments able to be completed by each staff member. However, it is predicted that the proposed comprehensive approach would realise greater enduring value and lasting changes

within each sector requiring less repeat visits and will more rapidly reduce environmental impacts.

Technological initiatives such as the development of remote data capture using hand-held devices and more rapid reporting capability using a site incident database that is set up to produce standard letters and/or reports, would offset some of this lost time.

Using the lower (conservative) end of the estimated annual site audit completion rate (100 high risk sites per FTE) and considering the rough estimated total of 700 high risk industrial sites in the Waikato, produces the following table of resource requirements:

Numbers of Staff (FTE's)	Time to visit all high-risk sites (years)
1	7
2	3.5
3	2.3
4	1.8

These estimates of resource requirements do not account for any pro-active assessment programme to address Waikato's moderate risk industrial activities, which are estimated at around 1,500 sites. Nor do they account for additional factors such as sites requiring follow up from pollution complaint response team activities, or input to the consent process as more consents are applied for following audits as discussed below.

7.1.2 Industrial area blitz

Industrial Area Blitzes are also recommended as a proactive component of the ISP[3] Programme, focussing on clusters of industrial development within urbanised centres (such as parts of Hamilton) and in outlying townships.

Area Blitzes can be tailor-made to suit the circumstances of staff resources, TA support and number of industries (and type) in the area. ARC experience has shown that auditing a cluster of 100-150 industrial sites is manageable within a reasonably small time frame of around a week. Such a cluster is typically made-up of 25% high risk sites, 50% moderate risk and 25% low risk sites, although the proportions vary depending on land use zoning approach adopted by the relevant TA.

Based on ARC experience low risk sites typically require around 1 hr each on average and moderate risk sites around 2 hrs for each audit, provide appropriate education material and follow-up where required.

Therefore, an industrial area with 150 sites, with the proportions 25% high, 50% moderate and 25% low risk respectively, will require approximately 450 hours in total to complete from initial scoping to final report preparation. This equates to approximately 25% of an FTE, meaning completing four blitzes per year would end up requiring the equivalent of 1 FTE.

7.1.3 Industry group projects (IGP)

Industry group projects fill an important niche in the spectrum of industrial activities and as discussed earlier in this report they contribute a disproportionate amount of the pollution complaints received by urban pollution response teams. As discussed earlier GWRC, ECan and ARC have already embarked on a programme of IGPs with a variety of clients. Therefore there is already a wealth of information that can be easily captured and amended for the Waikato. In some areas, such as Hamilton City, IGPs could be conducted by the city council as part of its trade waste programme. HCC have already commenced such a programme with vehicle washing companies but require more support to ensure that errant site operators are required to comply.

Liaison with TAs about their interest in and capability to undertake IGPs with EW is an important role for the ISP[3] Project Leader.

Where the TA is unwilling or not appropriately skilled to undertake an IGP the EW proactive auditing team should do the work as part of the ISP[3] programme. There is a need to ensure that IGPs are undertaken region wide within a reasonable timeframe (say 6 months) to ensure that poor operators in outlying areas do not obtain an advantage over operators who are doing the right thing.

Staff time requirements are difficult to asses compared to other jurisdictions as much of the foundation information is already available. Much of the formulation of education and communication with the sector will need to be jointly developed with the EW Community Education/Communications Team. However, a rough guide to time requirements for the auditing team to compile an operator list, make contact, send out information, audit operations and follow up, based on ARC staff comments indicated that each IGP requires around 25% of an FTE. Therefore, an annual target of four IGPs would require 1 FTE.

7.1.4 Industry specific educational resources (Tools)

The tools that are used to provide industry specific education been previously discussed in this report in Section 6, including:

- Pollution Prevention Guideline;
- Site Environmental Management Plan Guideline;
- pollution fact sheets;
- industrial sector specific best practice guides and codes of practice;
- online tutorials.

To some degree resources in all of these areas are already available and would be easily modified for the Waikato context (with a combination of community education and technical staff input). It is the author's belief that given limited EW resources and experience with industrial sites, coat-tailing on existing tried-and-true information is the most efficient and effective way to proceed. ISP[3] team input will be essential and should not be underestimated particularly in the early years of the programme; collectively 1 FTE of auditor time should be devoted annually to gradual preparation of these supporting initiatives/documents.

7.1.5 New high risk industrial activities

Get them right from the start! As discussed earlier there is a significant amount of new business commencing each year, changing location or ownership. A conservative figure of around 5% has been adopted for the Waikato although ARC experience in Auckland would indicate a higher figure of around 10%. Effort with these operations in conjunction with the TAs to ensure that they are appropriately established at the start will result in a significantly reduced future workload with them. Often when starting up, business put in a lot of effort to get all the information they can about operating within the law, so they will generally be receptive to proactive assistance regarding environmental protection. However, having commenced operation they are more reluctant to comply with requirements for expensive retrofitting pollution prevention equipment disrupting their operation.

It is estimated that there are around 700 high risk industries in the Waikato based on information for Hamilton City (see Appendix 5). Using the figure of 5% change per year from above, this would account for around 35 sites per year requiring proactive advice.

The theoretical nature of new sites makes them more difficult to deal with in some regards, as it is hard to envision exactly how things will work, but easier in that pollution prevention can be a major consideration when planning lay-out.

Overall new activities and site changes are expected to require around 300 hrs or 15-20% of an FTE per year (based on ARC auditing time estimates).

7.1.6 Industrial activities requiring pollution response action

High risk sites that operate in a way that requires intervention due to pollution problems being reported should become a priority ahead of any other site. These sites demand our attention as they have proven by their own actions that they need a significant amount of improvement in site management. Once the initial problem leading to the initial complaint has been stopped a thorough audit and development of an EMP is essential to ensure that problems do not reoccur.

Records of annual complaint numbers resulting from industrial site discharges industrial activities are difficult to obtain for the Waikato possibly due to the debate regarding responsibility for management of industrial site discharges that enter public stormwater systems. The Wellington region is expected to be the most comparable of the regional councils that data was available for. Information from GWRC annual compliance reports (2005-06) indicates that around 1,400 complaints are received annually and 50% relate to pollution land or water. However, only a small proportion (5%) is sourced to industrial activities (around 70 sites per year). If this was extrapolated to the Waikato context an estimated 560 hrs of officer time would be required, which equates to about 30% of an FTE per year.

7.1.7 Industrial activities applying for other discharge consents

Experience (ARC and others) has shown that ensuring industrial activities consider all relevant operational requirements at one time will be better received than later visits identifying further changes such as site environmental management plans or retrofitting treatment equipment.

The ARC proactive auditing team found a strong correlation between sites that have air discharge consents and the need for site stormwater management. Historically many Auckland sites received air discharge consents (such as grit blasting) with conditions specifying no adverse air effects beyond the site boundary. Unfortunately these consents often relied upon the material discharged to air settling out before the site boundary. This practice can lead to stormwater problems as the settled material is mobilised by the next decent rainfall event straight into the stormwater system and beyond.

Industrial sites with process wastewater consents to land or water should also be audited for stormwater contamination problems (and potentially the need for stormwater discharge consents) at the time their wastewater discharge consents are renewed.

Typically around 46 air consents (average of new and renewals of existing consents in years 2000 to 2007) are applied for each year (see Table 3), requiring 368 hrs auditing time (at 8 hours per site).

Table 3: Typical air consents applied for from Environment Waikato each year

		Year Received								
Type	**Discharge to Air**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**Up to April 2008**
New Appliance	**Change to a resource consent**	5	2	5	9	4	5	10	2	1
	New resource consent	40	31	17	28	21	19	29	28	6
Replacement Appliance	**Change to a resource consent**	2	3	6	2	2	3	2	9	
	New resource consent	3	8	6	11	9	11	20	15	1
Total		50	44	34	50	36	38	61	54	8

7.1.8 ISP^3 team resource requirements

Considering the information provided above regarding staff resource requirements would require a team of six industrial site auditors including a project leader. This would enable EW to produce a staged proactive industrial site assessment programme collaboratively with TAs that were willing and able to participate.

The programme would include:

- proactive sector based industrial site auditing of all high risk industrial sites in the Waikato over a 5-10 year period
- completion of four Industrial Area Blitzes per year
- completion of four IGPs per year
- gradual completion of industry specific educational resources in line with industries being targeted by the ISP^3 programme
- ensuring all high risk industrial sites that are proposed or newly established, sites with major pollution events and those applying for other EW consents are audited and are set up and operating appropriately.

7.2 Impacts on other teams

As discussed in Section 2.1.6, the flow-on impact of the ISP^3 programme on other groups within EW and external agencies should not be underestimated. Some of the measurable impacts experienced by other regional councils are detailed as far as possible below.

7.2.1 Consents and compliance group

The impact ISP^3 implementation depends to a large extent on whether EW move or are forced toward a requirement for discharge consents for industrial sites with discharges onto land that will get into the public stormwater system or not. If consents are required at around 700 sites will require authorisation which is a significant workload even when spread out over a 5-10 year period to coincide with the timeframe proposed for the ISP^3. The most sensible time to engage with industry regarding consent requirements is at the time of initial proactive site auditing, ensuring that any identified site improvements and management plans are required by consent conditions setting a timeframe for development and implementation.

7.2.1.1 Impacts on the stormwater consents and compliance

The number of consent processing hours and therefore processing staff can be estimated using the figure of 700 high risk sites that would require discharge consents. ARC consent processing information indicates each high risk industrial site requires around 40 hrs to process on average, which means a staff member could process

around 40 consents per year. Therefore, 700 sites could be processed in a 5 year time frame by two FTE's.

These timeframes do not take into account the potential outsourcing of consent processing services which is fully cost recoverable.

7.2.1.2 Impacts on contaminated land management staff

The impacts on staff dealing with contaminated land management issues are difficult to predict quantitatively. However, one of the reasons that some industrial activities are considered high risk is land contamination and experience from ARC auditing has confirmed this to be the case. Contaminated land staff input will be required in a high proportion of industries where the key contaminants include heavy metals and/or hydrocarbons, such as scrap metal dealers, auto wreckers, and timber treatment companies.

7.2.1.3 Impacts on community education staff

As briefly discussed in Section 2.1.6 there is potentially a significant workload generated by an ISP^3 programme for communications and community education staff within EW and collaborating TAs. There huge opportunity for synergy between cleaner production staff activities with industry and proactive auditing visits. However, as stated previously it is essential not to confuse the two programmes as they have very different methods of operation, the key difference being that pollution prevention is not optional by industry whereas cleaner production is.

Communications/education staff will be essential to ensuring that industry educational material, questionnaires etc are appropriately couched to reach the target audience and elicit the best response for the programme.

In terms of community education taking the pollution prevention message to schools is a huge opportunity especially where it can be coupled with the existing successful programmes in the Waikato (Enviroschools and Stream Sense). Educational material, like the Great Drain Game from Auckland, could also be contracted into the region if sufficient funding could be sourced from industry (each school would cost around $600 based on the Auckland contract).

Experience with programmes in Auckland leads the author to recommend that a dedicated FTE for education/communications should be included in the ISP^3 team framework.

7.3 Impacts on industrial site operators

It is recognised that the ISP^3 programme will result in a significant impact on business in terms of dedicating time and resources to improve site management practices and procedures, prepare environmental management plans and in some cases install treatment devices. Where businesses positively participate in the programme, the costs to them and the community will be minimised. As discussed previously there are tax breaks available to off-set the costs of installing environmental protection equipment.

As described above the ISP^3 programme advocates the use of a wide variety of tools to assist industry via a consultative and collaborative approach. However, experience at other regional councils has repeatedly shown that there will be a small minority of operators who will oppose any change in regime that requires them to clean up their act. The increasing "cost-of-compliance with the RMA" is likely to become the catch-cry of the reluctant site operators who do not wish to have site management requirements imposed on them. The strongest counter to these arguments is sampling evidence from their sites, particularly site stormwater catch-pit sediments, showing high levels of toxic contaminants sourced uniquely from their industrial activity.

8 ISP^3 strategy recommendations

The preceding chapters (and the appendices that follow) have reviewed the need for a proactive industrial site auditing programme for the Waikato region. This section summarises the key findings and recommendations of each chapter into one overall strategy.

8.1 Statutory review

The statutory basis for the programme has been discussed in Section 1 and Appendices 3 and 4. A proactive industrial site auditing programme (the ISP^3) is clearly mandated by the provisions of a number of statutory documents, particularly the: LTCCP 2006-16, the WRPS and the PWRP.

The divergence of opinion between EW and some of its constituent TAs regarding responsibility for the management of discharges to land from industrial activities that result in contaminants entering public stormwater networks is well known. Some other regional councils face similar dilemmas, particularly where comprehensive catchment stormwater discharges consents are being granted to the TA. There are some innovative approaches being trialled to ensure that unacceptable practices are not allowed to continue unresolved, such as the transfer of enforcement powers to TA officers in Wellington, which may offer a partial solution.

A review of other regional council approaches indicates that EW could choose to require discharge consents from the operators of industrial sites where contaminants get onto or into land under s15(1)(d) or under s15(1)(b) where the contaminants may get into water. Such discharges are currently innominate as they are not covered by a rule in a Regional Plan or Proposed Regional Plan, which makes them discretionary activities.

To avoid having to consent all industrial site discharges a plan change would be advisable separating out the high risk facilities that require careful site management and treatment devices, for closer scrutiny via the consenting process. Those industrial activities that are of moderate or low risk and can manage discharges by practical management practices could be made Permitted Activities under either s9 or s15. The alternative is to rely upon all of the region's TAs to change their District Plan land use provisions for industrial sites. As discussed in Appendix 2 this option presents some serious difficulties, particularly the length of time to get plan changes, existing land use rights under s10 and obtaining regional consistency.

A review of the PWRP rules for industrial activities should also reconsider the table in Section 3.5.12 "High Risk Facilities" for the appropriateness of the risk ratings that have been defined and to consider any activities that should be included (or removed).

8.2 Relationship with TAs

The intention of a collaborative ISP^3 programme is to ensure that, regardless of statutory agency obligations, industrial site operators are held accountable for keeping their site stormwater clean. The most efficient and effective approach is to deal with the site operator directly as they are best placed to employ appropriate site management practices to protect stormwater quality and thereby receiving water bodies.

Ideally a cooperative approach that avoids duplication would be taken, which ensures that the organisation best paced to formulate and implement the necessary controls takes the lead role. In any event a successful approach will involve both partners in local government, robust and complementary rules at regional and district level and may include transfer of powers and/or cross authorisation of enforcement officers and other collaborative initiatives.

8.3 The ISP^3 team

The framework necessary to support an efficient and effective ISP^3 programme has been discussed in Section 2. Trial and error within other regional councils has shown that successful proactive auditing teams work best where they are:

- formed with a clear management framework supported by politicians and senior management across council
- provided with a sufficient staffing resource from the start to achieve the programme objectives in an achievable time frame
- focused on proactive auditing and not distracted by other responsibilities
- underpinned by robust policy and with supportive statutory partners
- constituted with experienced personnel provided with specific auditing and other specialist training
- supported by clear, concise, practical and pragmatic operational guidelines
- well equipped to undertake auditing activities (hardware and IT).

The numbers of staff resources that would be required have been discussed in greater detail in Section 7.

8.4 Proactive ISP^3 initiatives

A range of programme components and tools that have been have been developed and refined by other regional councils have been described and evaluated in Sections 3 – 6. In order to provide a holistic approach to pollution prevention it is the author's view that the menu of programme components should reach: high risk industrial activities; activities that cause a significant number of pollution problems (both domestic and industrial); and community involvement particularly education.

The programme components recommended are:

- proactive sector-based industrial site auditing
- industrial area blitzes
- industry group projects
- community/schools education.

In terms of the documents necessary to support these programmes, a significant amount of effort has been invested by GWRC, ECan, ARC and other councils in developing resources which can be taken up in the Waikato context. The menu of tools that are currently available (and which council has them) are described in detail in Section 6 and are summarised as follows:

- industry specific codes of practice/best practice guides (ARC)
- pollution fact sheets (GWRC, ECan and ARC)
- stormwater treatment device recommendations (specific to signature contaminants associated with a specific industry) (ARC)
- environmental management plan (EMP) generic guideline (ARC)
- Pollution Prevention Guide (ECan)
- online checklists for industrial sites (GWRC)
- online PPG training module (ECan's Spills Course).

Equipment, IT and documents specific to the auditing team include:

- database to store site auditing information (Hamilton City Council with amendments to include additional information)
- GIS drainage maps showing connections into the public stormwater network infrastructure (Waikato TAs)
- vehicles and sampling equipment (EW response team)
- Urban Pollution Response Manual including Health and Safety (ARC)
- urban waterway assessment tool (Wai Care's Visual Smells Test modified– for officer and community use).

8.5 Programme component prioritisation (for limited resources)

Where staff resources are limited to 2-3 staff, the author recommends concentrating on high risk industrial sites using a sector based approach as the core of the programme. Focussing on these industries will provide the best return for ratepayer dollars in terms of environmental protection while ensuring that it creates an even playing field affected site operators in each sector.

The sector based approach has the primary objective of protecting and improving land and water quality from industrial activities through proactive site audits by:

- identifying and stopping any actual pollutant discharges to land or water
- identifying and putting site management controls in place to avoid potential discharges
- ensuring industrial site operators are prepared to deal with accidental discharges through the preparation of emergency spill response plans and staff training.

A ranking process is recommended to establish a prioritised order in which the industries should be proactively approached. Risk factors to be used when evaluating priorities are:

- signature environmentally hazardous substances (EHS) typical of that industry type
- the potential environmental harm the EHS may cause (acute or chronic – short or long term)
- historical experience of the likelihood of EHS release for each industry type
- approximate number of sites in the region and likely size of the businesses
- geographic spread.

To help provide further separation additional weighting factors to be considered include:

- industry partnerships that have already been established (e.g. cleaner production)
- programme partner preferences (where collaborating with a TA)
- political preferences
- previous actions with a particular site, industrial sector, or industrial area (level playing field issues)
- industries that have established codes of practice (CoP) or best practice guides that meet our environmental requirements (e.g. scrap metal industry).

Once a prioritised list has been established and an industry selected, the following process is recommended to implement each high risk industrial sector project.

1. Identify all of the industrial sites undertaking the industrial activity in the region.
2. Understand the industry and any unique combination of operational constraints and contaminant types that it faces.
3. Source best practice guides or codes of practice for the industry sector and modify to suit the Waikato context.
4. Identify all the relevant industrial activity operators in the region.
5. Introduce the guidance document to a relevant sector group and get feedback.

6. Distribute the modified guidance document to the sector region-wide and encourage them to work through the Guidance document and implement the recommended best practices over a period of 6 months.
7. Audit all the sites (after 6 months) to assess progress with implementing the management practices identified in the guide.
8. Identify any actual or potential problems that require attention and establish a timeframe for resolution.
9. Prepare a final 'state-of-the-industry' report within the region.

Prioritisation processes for the other programme components are discussed in detail in Section 5.

8.6 Community education

EW already operate a diverse and successful schools and/or community education programme focussed strongly toward rural issues such as riparian vegetation enhancement. In light of the general thrust flagged thorough the LTCCP 2006-16 to put more effort into urban contamination problems, existing programmes could be augmented relatively easily to include urban stormwater quality problems.

It is essential to ensuring that the community recognises the valuable part they can play in raising awareness and changing behaviour. Consumer choice is an important tool in ensuring the good operators get rewarded. For this reason EW should consider issuing 'clean-green process' certificates when they have audited industries and found good practice, which businesses could use to promote themselves especially when tendering for work.

There are a number of other community/schools educational initiatives that focus on urban pollution issues, such as the 'Wai Care' and 'Take Care' programmes in Auckland and Wellington respectively, and the Great Drain Game from Auckland, that could be imported into the Waikato.

8.7 ISP^3 programme funding

A number of different funding options were considered as detailed in Section 2.2.2 and the approach of using a targeted regional rate on industrial property combined with limited cost recovery is recommended. Based on previous EW experience and proactive pollution programmes elsewhere this combination is considered the most likely to be acceptable to both industry and the community generally.

Industrial activates are both exacerbators (i.e. without their actions the programme would not be necessary) and beneficiaries (i.e. they derive direct benefit in terms of assistance to meet their environmental responsibilities) of the programme. While there is also a wider benefit to the community of improving water quality, generally speaking ratepayers support the 'polluter pays' principle and are intolerant of polluters not being required to fund the full cost of their poor environmental practices being remedied.

Cost recovery from individual operators is recommended for situations where: recalcitrant site operators are encountered requiring a number of visits to achieve compliance; or where discharge problems are so severe that immediate remedial works are required; and/or where sampling and analysis is required to provide proof for requiring remedial actions. It is inappropriate to expect industry as a specific ratepayer group to pay for ongoing poor site management on individual sites.

Appendix 1: Industrial activity risk rankings

Three different industrial activity ranking systems have been compared to get a 'best practice' approach for EW to use in prioritising industries for an ISP[3] programme.

EW Proposed Waikato Regional Plan (PWRP) Section 3.5.12 High Risk Facilities

The PWRP provides a table of 23 industrial activities (as shown below) that are considered to be a high risk of creating stormwater pollution. The industrial activities do not appear to be presented in any particular order. However, the table includes a rationale for why each is represented in the table which is very helpful in assisting plan readers understand why they have been included.

MfE's Hazardous Activities and Industries List

MfE have developed a Hazardous Activities and Industries List (HAIL), based upon an ANZECC list promulgated in the early 1990's, for use by statutory agencies when compiling registers of potentially contaminated land that should be investigated. The HAIL is a compilation of activities and industries that are considered likely to cause land contamination resulting from hazardous substance use storage or disposal. The list includes generic activities that might occur regardless of industry type (e.g. fuel storage) and specific industries that have a history of high pollution potential due to the nature of the activity (e.g. timber preservation). There are 53 activities or industries included on the HAIL and they are presented in alphabetical order. Not all of the HAIL categories are relevant to industrial situations as many rural activities are also listed.

ARC Proposed Auckland Regional Plan: Air Land and Water (ALW Plan) - Schedule 3: Industrial or Trade Activities (ITA)

ARC have developed through their ALW Plan, a schedule of ITAs that are separated into high, moderate or low risk. The ARC separated the ITAs first into generic process, then further by a description of the activity and finally by size (activity area) thresholds assuming that bigger sites are a greater risk. There are 81 activities listed as high risk, of these 19 are considered to be a high risk regardless of their size (activity area).

The following table provides a comparison between the different approaches described above. Industries or activities have been listed alphabetically allowing the order used in the most detailed system, the ARC's PARP:ALW augmented from the EW and HAIL lists where no suitable category existed.

Table A1.1 Risk status comparison

EW High Risk Facilities	EW High Risk Facilities - Reason for Classification	ARC ALW Plan Equivalent Categories	MfE HAIL list
1. Mechanical workshops and service stations.	These sites use and handle large volumes of oils and other petroleum products. Spillages of these substances are not uncommon; hence the greater risk of stormwater discharges to the environment.	Motor vehicle services facilities - Services stations (any area) Truck refuelling (non-service station) without stormwater treatment (any area)	32. Motor vehicle workshops 44. Service stations 9. Brake lining (manufacture, repair, recycle)
2. Printers.	Relatively large quantities of dyes and paints are handled at these sites. The risk of spillages is relatively high.	Paint, pigment, inks and dyes (>5,000 m^2)	40. Printing (commercial using inks, dyes or solvents)
3. Spray painting facilities.	Paints can not only be spilt at these sites but can enter stormwater as a consequence of drift from spray painting operations.		
4. Meat, fish and shellfish processing industries.	Wastes from these industries can typically have a high BOD. This can cause significant adverse effects.	Pet food manufacture (>5,000 m^2) Slaughter (>5,000 m^2) Manufacture, store or handle products derived from animal slaughter (e.g. gelatine, fertiliser or meat products) (>5,000 m^2) Rendering or fat extraction (any area) Meat and meat products including fish (>5,000 m^2)	
5. Dairy products processing.	Wastes from these industries can typically have a high BOD. This can cause significant adverse effects.	Processed dairy foods (>5,000 m^2)	
6. Waste management sites (transfer stations, compost sites, landfills etc.)	Litter, hazardous substances and high BOD wastes can all enter stormwater systems from these sites.	Landfills (any area) Automotive dismantling (any area) Batteries (any area) Chemicals (any area) Crushing grinding or separation (other than sand, gravel rock or mineral) (>5,000 m^2) Hazardous materials storage or treatment (any area) Metals (crushing grinding sorting or storage) (>1,000 m^2) Non-metal recycling (composting, glass, paper or paper board) (>5,000 m^2) Oil, petroleum hydrocarbon wastes (>1,000 m^2) Chemical containers cleaning reconditioning, or recycling (area >1,000 m^2) Sewage solids treatment or storage facilities (any area) Tyres (>1,000 m^2) Waste transfer stations (any area) Hazardous materials treatment or storage (excluding wastewater) (any area) Sewage solids storage (excluding within the network) (>5,000 m^2)	27. Landfills 43. Scrap yards (including automotive dismantling) 8. Battery (manufacture or recycling) 49. Waste storage, treatment or disposal 43. Scrap yards (including automotive dismantling) 36. Petroleum or petrochemical industries or storage (including production, processing, recovery, retail, reprocessing recycling or bulk storage) 16. Drum/tank reconditioning or recycling 49. Waste storage, treatment or disposal
7. Truck wash facilities	The activity of truck washing can was hazardous contaminants of trucks as well as sediments and wastes from spillages on site.		

EW High Risk Facilities	EW High Risk Facilities - Reason for Classification	ARC ALW Plan Equivalent Categories	MfE HAIL list
8. Unenclosed manufacturing and bulk storage of fertiliser.	Fertilisers can give rise to high levels of nutrient in stormwater discharges. Where fertilisers are manufactured or stored in such a way that fertilisers can enter stormwater the risk of adverse effects is unacceptably high.	Inorganic fertiliser manufacture, storage or handling (>5,000 m^2)	22. Fertiliser manufacture or bulk storage
9. Textile fibre and textile processing industries where dying and washing of fabric occurs.	Large quantities of dye and high BOD wastes (from wool scourers for instance) are handled on these site. The risk of spillages that could enter stormwater is high.	Scouring or carbonising greasy wool or fleece (>1,000 m^2)	51. Wool, hide and skin merchants (e.g. drying, scouring)
10. Tanneries and leather finishing.	Large quantities of dye and high BOD wastes are handled on these sites. The risk of spillages that could enter stormwater is high.	Tanneries or fellmongeries (any area)	46. Tannery, fellmongery or hide curing
11. Footwear manufacture.	Large quantities of dye and high BOD wastes are handled on these sites. The risk of spillages that could enter stormwater is higher.		
12. Manufacture of paper and paper products.	Hazardous substances such as chlorine based bleaches and dyes are regularly handled on these sites. The risk of spillages etc. entering stormwater can be high.	Pulp, paper or paper board manufacturing (>5,000 m^2)	12. Manufacture of paper and paper products
13. Manufacture or processing of chemicals, and of petroleum, coal, rubber and plastic products.	The risk of spillages associated with hazardous substances used in these industries can be high.	Batteries (any area) Cosmetics, toiletry, soap and other detergents (>1,000 m^2) Explosives and pyrotechnics (>1,000 m^2) Fungicides, herbicides, pesticides timber preservatives and related products (any area) Industrial Gas (>5,000 m^2) Medicinal, pharmaceutical or veterinary products (>5,000 m^2) Polishes, adhesives or sealants (>5,000 m^2) Solvents (>5,000 m^2) Synthetic resins (>5,000 m^2) Acids, alkalis or heavy metals (any area) Other chemical product manufacturing (e.g. plastics) (>5,000 m^2) Tyre manufacturing or retreading (>5,000 m^2) Synthetic rubber manufacturing (>5,000 m^2) Coal products (>5,000 m^2) Petroleum refining (>5,000 m^2) Petroleum hydrocarbon, oil or grease manufacturing (>1,000 m^2)	12. Chemical manufacture, formulation, bulk storage 8. Battery (manufacture or recycling) 21. Explosive production or bulk storage 35. Pesticide – commercial manufacture, blending, mixing or formulation 37. Pharmaceutical manufacture 33. Paint manufacture and formulation 2. Acid/alkali (production or bulk storage) 24. Gasworks 13. Coal and coke yards 36. Petroleum or petrochemical industries or storage (including production, processing, recovery, retail, reprocessing recycling or bulk storage)
14. Manufacture of clay, glass, plaster, masonry, asbestos and related mineral products.	The risk of spillages associated with hazardous substances used in these industries can be high.	Cement, lime, plaster and concrete product manufacturing (>1,000 m^2) Glass manufacturing (>5,000 m^2)	6. Asbestos product (production/use/disposal) 10. Cement or lime manufacture 14. Concrete manufacture and bulk cement storage

EW High Risk Facilities	EW High Risk Facilities - Reason for Classification	ARC ALW Plan Equivalent Categories	MfE HAIL list
15. Manufacture of fabricated metal products, machinery and equipment.	The risk of spillages associated with hazardous substances used in these industries can be high.	Industrial machinery or equipment manufacturing (>5,000 m^2) Motor vehicles or parts manufacturing (>5,000 m^2) Other machinery or equipment manufacturing(>5,000 m^2)	20. Engine reconditioning
16. Electroplaters, Foundries, galvanizers and metal surfacing.	The risk of spillages associated with hazardous substances used in these industries can be high.	Metal plating, anodising or polishing (any area) Metal blasting or coating (excluding spray painting) (>1,000 m^2) Refinement of ores (>5,000 m^2) Processing of metals (e.g. smelting, casting) (>5,000 m^2)	1. Abrasive blasting (operation or disposal) 30. Metal treatment or coating 31. Mining, extractive industries and metal processing 45. Smelting or refining 23. Foundry operations 26. Iron and steel works
17. Concrete batching plants and, asphalt manufacturing plants.	The risk of spillages associated with hazardous substances used in these industries can be high.	Concrete batching plants (any area) Bitumen/asphalt premix or hot mix (>1,000 m^2)	14. Concrete manufacture and bulk cement storage 7. Asphalt or bitumen (production or bulk storage)
18. Stock saleyards.	High BOD run-off can be associated with these sites.		
19. Bakeries.	Outside washing of trays, dishes and pans can result in high BOD, fats, greases and detergents entering stormwater systems.	Bakery product manufacturing (>5,000 m^2)	
20. Car wash and valet services.	High oil, solvent and solid discharges can occur from these activities.		
21. Commercial laundries (excluding self-service laundrettes and Laundromats).	The risk of spillages associated with detergents, alkalis and salts used in this industry can be high.		17. Dry cleaning plants
22. Furniture/wood manufacturing and refinishing industries.	Some of these industries work outside extensively, usually with no stormwater treatment, Contaminants such as sawdust, glues and alkali stripper solution in the stormwater coming of these sites can include high solids, BOD and high pH.	Plywood or veneer manufacturing (>5,000 m^2) Particle board or other wood panel manufacturing (>5,000 m^2)	
23. Timber preservation, treatment and storage sites where chemically treated timber is sorted.	A range of hazardous substances are used on these sites (e.g. Copper Chrome, Arsenic, Boron and copper-quinoline compounds). In addition, timber treatment chemicals have been shown to be able to leach from treated wood in storage.	Timber treatment (any area) Treated timber storage (>5,000 m^2)	50. Wood treatment and preservation and bulk storage of treated timber 42. Sawmills (using chemicals)
		Stock food manufacture storage or handling (>5,000 m2)	
		Circuit board manufacturing – excluding assembly only (any area)	18. Electrical transformer manufacture, repair or disposal 19. Electronics manufacture and reconditioning
		Beverages or malt product (>5,000 m^2) Flour mill or cereal foods (>5,000 m^2) Oil or fat product manufacturing or handling (>5,000 m^2) Vineyards or wine (>5,000 m^2) Other foodstuffs manufacturing (>5,000 m^2)	
		Naval and air force defence facilities (>1,000 m^2)	5. Analysts (commercial labs) 15. Defence works and establishment

EW High Risk Facilities	EW High Risk Facilities - Reason for Classification	ARC ALW Plan Equivalent Categories	MfE HAIL list
		Log storage yards (outside forested areas) (>5,000 m^2)	
		Electrical substations (area >5,000 m2) Electricity generation (area >5,000 m2)	39. Power stations and switchyards
		Bulk chemicals storage or handling centres (>5,000 m^2) Bulk hydrocarbons storage or handling centres (>5,000 m^2)	12. Chemical manufacture, formulation, bulk storage 22. Fertiliser manufacture or bulk storage 48. Storage tanks and drum storage for fuel, chemicals and liquid wastes
		Boat or ship construction, repair or maintenance (>5,000 m^2) Bus depots (>5,000 m^2) Commercial airports (>1,000 m^2) Road freight transport depot (bulk chemical) (>1,000 m^2) Railway workshops or refuelling depots (>5,000 m^2) Shipping loading/unloading (>5,000 m^2)	38. Port activities (including maintenance) 47. Transport depots 4. Airports 41. Railway yards (goods handling, workshops and refuelling facilities) 38. Port activities (including maintenance)
			34. Pest control (commercial) 3. Agrichemical spray contractor

Conclusions and discussion of tabulated information

The table above shows a great deal of similarity between the three lists of high risk industries. Of the three, the ARC approach goes into considerably more detail on actual industry types than the other two and separates sub-groups within industry types based on Auckland and overseas experience. Size thresholds are mainly applied to ensure that small operations which undertake a particular activity but only as a small part of their operation do not get captured by inappropriate and/or overly onerous rules. The use of a size threshold may not be particularly helpful unless coupled with the Plan rules that apply to sites that do not trigger the thresholds. In the ARC case these sites still have tight operational requirements to ensure that stormwater contamination is minimised.

The other value of a size cut-off, is that it acts as an incentive for some industries to modify their site practices to avoid consent requirements. The main value of a detailed list is certainty; the main risk is missing some activities that would be captured with a more generic description.

A recommended priority list from the above would ideally marry-up the occurrence of high risk industries in the region with the risk of site contamination identified by the HAIL list to get the best result from effort expended.

With regard to the PWRP, a review of the EW industrial activity risk ranking system is recommended to reconsider the relevance of the risk ratings that were defined when the Plan was first notified and to consider any omitted (or new) activities that should be included or existing categories that could be better described or that should be removed.

Appendix 2: Stormwater management roles and responsibilities

A2.1 Introduction

The purpose of this Appendix is to provide of the EW and the Waikato region's TAs regarding the management of stormwater quality. This report provides the authors view on the statutory roles and responsibilities of Environment Waikato and the Waikato region's Territorial Authorities under the RMA relating to the management of stormwater quality based on experience in other regions. The report is intended to provide a vehicle for discussion around the current uncertainty regarding the roles and responsibilities. The barriers to integrated management and opportunities for improvement based upon experience gained elsewhere in New Zealand are also explored. Finally it provides some assessment of pros and cons of the different options reviewed in this document.

Decisions about stormwater quality management fall into two areas: first and foremost who can/should have the statutory responsibility for management of the sources of contamination and secondly as a consequence who can/should undertake the proactive assessment of sites to ensure that quality objectives are being met.

The circumstances that need to be considered are:

- discharges to water from TA infrastructure
- discharges to land or water by private individuals or companies
- discharges to land in a position where it may get into the stormwater network by private individuals or companies
- the implementation of measures **at source** to control industrial site runoff.

The primary statute is the Resource Management Act (1991) (the RMA), but other relevant legislation and statutory policies and plans of EW including:

- the Local Government Act (2002) and amendments
- the Waikato Regional Policy Statement (WRPS)
- the Proposed Waikato Regional Plan (PWRP).

Where there is uncertainty regarding who should deliver a particular function, or where statutory functions overlap or are duplicated, a range of options is provided together with a pros and cons analysis of each approach.

A2.1.1 Authorisation of stormwater discharges

The discharge of stormwater onto land or into water (including coastal water) is regulated by Section 15 of the RMA which states that:

S15 Discharge of contaminants

(1) No person may discharge any -

a) Contaminant or water into water; or

b) Contaminant onto or into land in circumstances which may result in that contaminant (or any contaminant emanating as a result of natural processes from that contaminant) entering water; or

c) Contaminant from and industrial or trade premises into air; or

d) Contaminant from any industrial or trade premises onto or into land –

unless the discharge is expressly allowed by a rule in a regional plan and in any relevant proposed regional plan, a resource consent, or regulations……

S2 of the RMA includes the following definitions:

*"**Contaminant**" includes any substance (including gases, odorous compounds, liquids, solids and micro-organisms) or energy (excluding noise) or heat, that either by itself or in combination with the same, similar, or other substances, energy or heat -*

a) *When discharged into water, changes or is likely to change the physical, chemical or biological condition of water; or*

b) *When discharged onto or into land or air, changes or is likely to change the physical, chemical or biological condition of the land or onto or into which it is discharged.*

"Water" –

a) *Means water in all its physical forms whether flowing or not and whether over or under the ground:*

b) *Includes fresh water, coastal water, and geothermal water:*

c) *Does not include water in any form while in any pipe, tank, or cistern:*

***"Land"** includes land covered by water and the air space above land:*

***"Discharge"** includes emit, deposit and allow to escape:*

These provisions in combination make it clear that any discharge of stormwater to water (i.e. groundwater, stream, river, lake, or the sea) or to land (which is pretty much everything that is not water or air) requires authorisation under S15 of the RMA. In the absence of rule in a regional plan providing Permitted Activity status for stormwater discharges, a resource consent will be required.

The provisions of the PWRP in relation to stormwater discharges are detailed in Appendix 3, Rule 3.5.11.4 (Permitted Activity), 3.5.11.7 (Controlled Activity) and 3.5.11.8 (Discretionary Activity).

Contaminants entrained in stormwater can be authorised by a Permitted Activity rule in a regional plan or resource consent. The discharge of stormwater to land, which includes all hard surfaces as well as bare ground (and in successful prosecutions taken by the ARC has also included parts of the stormwater infrastructure itself – cesspits, pipes etc), may be governed by S15(1)(b) and where the discharge is from an industrial or trade premises by S15(1)(d).

A discharge is generally deemed to have occurred at the point where "control" has been lost by the discharger. It could be argued that diffuse (or non-point source) discharges to an industrial site are still theoretically under the control of the site owner or operator if they then drain to a pipe outlet from the site. In this circumstance the question must be asked: "To what extent is the site owner/operator in a position to manage the discharge from the site in terms of contaminant capture and/or treatment, particularly considering the unpredictability of rainfall events?".

The discharges from municipal stormwater infrastructure require authorisation and in most circumstances it would be logical to include approval of contaminants entrained in the stormwater that have been mobilised by natural forces such as rainfall and gravity. However, where some or all of the contaminants have been generated by a process being undertaken by a site operator who is beyond the control of the network provider, there is often an understandable reluctance to take responsibility for the quality of the discharge (note: See HCC comprehensive stormwater discharge application which makes it clear that they are not taking responsibility for stormwater quality compromise that is caused by discharges from industrial sites).

Section 30 of the RMA provides for the administration of sites discharging hazardous substances in a position where they may get into stormwater by regional councils, as it states [abridged]:

30. Functions of regional councils under this Act

(1) Every regional council shall have the following functions for the purpose of giving effect to this Act in its region: ……..

(c) The control of the use of land for the purpose of –…….

(ii) The maintenance and enhancement of the quality of water in water bodies and coastal water: ……..

(v) The prevention or mitigation of any adverse effects of the storage, use, disposal or transportation of hazardous substances: …….

(f) The control of discharges of contaminants into or onto land, air or water and discharges of water into water:

Some duality in functions exists, however, in that S31 provides for the functions of territorial authorities including the administration of sites discharging hazardous substances in a position where they may get into stormwater as follows:

31. Functions of territorial authorities under this Act

Every territorial authority shall have the following functions for the purpose of giving effect to this Act in its district: …….

(b) The control of any actual or potential effects of the use, development or protection of land including …….. the prevention or mitigation of any adverse effects of the storage, use, disposal, or transportation of hazardous substances:

Therefore, both agencies have a function with regard to the administration of sites that are involved in the ***storage, use, disposal, or transportation of hazardous substances.*** In most jurisdictions the TAs administer 31(b) via land use consent requirements under Section 9 of the RMA through their District Plan provisions as follows [abridged]:

9. Restrictions on use of land -

(1) No person may use any land in a manner that contravenes a rule in a district plan or proposed district plan unless the activity is –

(a) Expressly allowed by a resource consent granted by the territorial authority responsible for the plan; or

(b) An existing use allowed by section 10 or 10A. …….

(3) No person may use any land in a manner that contravenes a rule in a regional plan or proposed regional plan unless the activity is –

(a) Expressly allowed by a resource consent granted by the regional council responsible for the plan; or

(b) Allowed by section 20 (certain lawful existing uses allowed).

(4) In this section, the word "use" in relation to any land means – …….

(a) Any use, erection, reconstruction, placement, alteration, extensio n, removal, or demolition of any structure or part of any structure in, on, under, or over the land: or ……

(d) Any deposit of any substance in on or under the land.

Although Section 9 clearly provides for regional councils to issue land use consents, duality of controls would seem to be inefficient and unnecessary where appropriate measures are being employed by the TA to give environmental protection. Unfortunately in many circumstances historical land use controls have been inadequate as they do not require site management practices that will ensure discharges do not have adverse environmental impacts (that being a regional council function). Therefore, most industrial or trade premises have been established, and have existing

use rights under the provisions of existing district plans (under s10 of the RMA), without the sorts of management controls that are now considered necessary and appropriate.

It is important to note that there is a subtle but significant difference in the wording of Sections 9 and 15. Section 9 is "*permissive*" in that it provides for land uses to occur as of right unless a plan or consent provides otherwise – the presumption being that it is allowed unless a plan provision prohibits it or specifies the conditions under which it can occur. Section 15 is the converse and is "*restrictive*" as it says discharges can't occur as of right unless authorised by a plan rule or resources consent.

This creates a significant potential problem for TAs in terms of requiring modern site management practices to be established on a site where they were not historically required as part of land use approval (conditions). In particular the revision of District Plan Rules making them more restrictive on land use activities is likely to encounter significant opposition through the statutory plan change process. Even if more stringent requirements can be introduced into the District Plan the problem is compounded by Section 10 which allows for lawfully established uses to continue, as follows [abridged]:

S10. Certain existing uses in relation to land protected

(1) Land may be used in a manner that contravenes a rule in a district plan or proposed district plan if -

(a) Either –

(i) The use was lawfully established before the rule became operative or the proposed plan was notified; and

(ii) The effects of the use are the same or similar in character, intensity and scale to those which existed before the rule became operative or the proposed plan was notified:……..

(4) For the avoidance of doubt this section does not apply to the use of land that is –

(a) Controlled under Section 30(1)(c) (regional control of certain land uses)

By contrast the implementation of changes as part of regional plan rules on existing operations is governed by Section 20A as follows:

20A Certain existing lawful activities allowed

(1) If, as a result of a rule in a proposed regional plan being notified, an activity requires a resource consent, the activity may continue until the rule becomes operative if,—

(a) before the rule was notified, the activity—

(i) was a permitted activity or otherwise could have been lawfully carried on without a resource consent; and

(ii) was lawfully established; and

(b) the effects of the activity are the same or similar in character, intensity, and scale to the effects that existed before the rule was notified; and

(c) the activity has not been discontinued for a continuous period of more than 6 months (or a longer period fixed by a rule in the proposed regional plan in any particular case or class of case by the regional council that is responsible for the proposed plan) since the rule was notified.

(2) If, as a result of a rule in a regional plan becoming operative, an activity requires a resource consent, the activity may continue after the rule becomes operative if,—

(a) before the rule became operative, the activity—

(i) was a permitted activity or allowed to continue under subsection (1) or otherwise could have been lawfully carried on without a resource consent; and

(ii) was lawfully established; and

(b) the effects of the activity are the same or similar in character, intensity, and scale to the effects that existed before the rule became operative; and

(c) the person carrying on the activity has applied for a resource consent from the appropriate consent authority within 6 months after the date the rule became operative and the application has not been decided or any appeals have not been determined.

Therefore, the implementation of regional discharge rules does not suffer from the same 'existing use' hangover that s9 Permitted Activity or consent requirements would. Six months after the rule has become operative a consent application (or compliance with PA provisions) would be required regardless of the existing activity. This difference between s9 and s15 is often misunderstood by site owners/operators who are more used to land use planning issues and are surprised that requirements can be changed.

It is important to note that the case law regarding situations where regional plans are silent with regard to certain discharges is they are deemed to be innominate (literally not named) and in such circumstances the discharge defaults to having a Discretionary Activity status. In the case of the PWRP there are arguments for both sides regarding the status of contaminant discharges onto land at industrial sites. It could be argued that the PWRP is silent on the issue and therefore these activities are currently innominate. However, it could also be argued that by issuing discharge consents to the network provider (or individual site operator where there is no municipal system) is all that is needed. This latter position follows the EW philosophy that as the TAs own and operate the pipe network they should also ensure the quality of what is discharged meets environmental requirements.

One major concern the author has about this approach is consideration of what the TAs are actually applying to discharge when they make their stormwater infrastructure discharge consent applications. As stated earlier, a particular case in point is HCC who have made it very clear in recent applications for the Hamilton City stormwater discharges, is that they are not assuming responsibility for industrial site operator contaminant discharges into their stormwater network. In this regard it is the author's view that EW can only issue consent for the discharge that HCC have applied for and not an expansion to accommodate other inputs (particularly contaminants HCC have no involvement in managing on a day-to-day basis).

There are a number of options that EW can consider if it does not wish to continue discharging it's functions of stormwater discharge management. In particular EW could transfer its responsibility for considering and granting consent applications to discharge stormwater to water or to land to a territorial authority under Section 33 of the RMA. However, such transfers of power cannot occur unless the criteria set out in S33 are met, in particular the following:

33. Transfer of powers [abridged]

(4) A local authority shall not transfer any of its functions, powers or duties under this section unless –

(a) It has used the special consultative procedure specified in Section 83 of the Local Government Act 2002……..

(c) Both authorities agree that the transfer is desirable on all of the following grounds:

(i) The authority to which the transfer is made represents the appropriate community of interest relating to the exercise or performance of the function, power or duty:

(ii) Efficiency:

(iii) Technical or special capability or expertise…..

The extent to which the TAs of the Waikato Region would want to take on this responsibility and their ability to fulfil these statutory requirements would require a detailed capability analysis prior to proceeding further. Furthermore, it is questionable

whether the public would be comfortable for the major service provider also having the consenting function.

A2.1.2 General duties – stormwater management

The RMA determines in Section 17 that responsibility for adverse effects caused by an activity rests with the person for whom the activity was carried out, specifically [abridged]:

S17. Duty to avoid, remedy or mitigate adverse effects –

(1) Every person has a duty to avoid, remedy or mitigate any adverse effect on the environment of an activity carried out by or on behalf of that person, whether or not that activity is in accordance with a rule in a plan, a resource consent, section 10, section 10A, or section 20.

(2) The duty referred to in subsection (1) is not in itself enforceable against any person, and no person is liable to any other person for a breach of that duty.

(3) Notwithstanding subsection (2), an enforcement order or abatement notice may be made or served under Part XII to –

(a) Require a person to cease, or prohibit a person from commencing anything that, in the opinion of the Environment Court or an enforcement officer, is or is likely to be noxious, dangerous, offensive or objectionable to such an extent that it has or is likely to have an adverse effect on the environment; or

(b) Requiring a person to do something that in the opinion of the Environment Court or an enforcement officer, is necessary in order to avoid, remedy or mitigate any actual or likely adverse effect on the environment caused by or on behalf of, that person ……. .

However, considering industrial site management practices and effects, this provision relies on the person carrying out the activity being aware of the environmental consequences, which is seldom the case until a significant effect has occurred and traced back to their site. There have been a number of cases where prosecutions have resulted from failure to comply with an abatement notice or an enforcement order in regard to a s17 matter.

It is the author's view that this provision supports the premise that since the site operator creates the problem they are the most appropriate party to take responsibility for taking actions that avoid, remedy or mitigate, as opposed to the operator of a piped stormwater system that they discharge into.

A2.1.3 Discharges to land or water by industrial site operators

Section 15 of the RMA makes no distinction between private parties and statutory agencies when considering the need for authorisation. If a private party wishes to discharge stormwater onto land, into groundwater, or to a stream, river, lake or the sea, then they require authorisation under section 15 of the RMA (via a rule in a plan, regulations or resource consent).

The consistency with which "private" dischargers have been required to seek authorisation for stormwater discharge in the Waikato is somewhat unclear. In theory at least where a site has its own pipe network discharging to a water body or ground soakage (i.e. it does not enter a public system) the site owner/operator is responsible for obtaining and holding the relevant stormwater discharge consent. Generally speaking large sites outside of reticulated areas, like dairy factories and meat works, hold their own stormwater consents.

The concept of 'Stormwater Network Consents' or 'Comprehensive Catchment Consents' makes the situation somewhat more complicated. Under the RMA all "Existing Use" authorisations (rights) granted under previous statutes, including the Water and Soil Conservation Act (1967), were deemed to expire in October 2001. Consequently all of the Regions TAs applied to renew all of their existing stormwater discharges thereby converting them to discharge consents, whether there was a formal

record authorising the system or not. In some jurisdictions (Auckland for example) a pragmatic and practical decision was made that all TA stormwater infrastructure existing as at October 2001would be considered covered by either existing use rights or comprehensive stormwater discharge consents. While this approach would be unlikely to withstand the test of a legal challenge it was considered to be the best way to proceed in the public interest.

Waikato TAs have applied for comprehensive stormwater network consents for the existing 'built' environment. However, it is important to gain clarification from the Applicant (TA) whether they intend contaminants entrained in stormwater from industrial sites to be included. As stated above the recent application by HCC indicates that while they might be happy to accommodate the volume of stormwater and the 'normal' contaminants that get entrained due to human activity, they are not applying to accepting responsibility for contaminant discharges by industrial site operators of contaminants linked to their industrial activity.

Therefore, the extent to which the TA comprehensive stormwater consent provides for the discharges of contaminants from industrial sites within the catchment depends on:

- what the TA applied to discharge and whether they understood the implications of that application (what was in the AEE)
- whether the consent is couched in a manner that provides for these discharges to occur
- the extent to which the TA is prepared to allow others to rely on its consent to permit contaminant discharges.

It is the author's view that any enforcement action that EW attempted to take against a TA for a discharge into their stormwater network by an industrial site operator would be unlikely to succeed unless there was explicit acceptance of responsibility through the consenting process.

A2.1.4 Discharges to piped systems by site operators

As noted under (2) above the RMA definition of water excludes water which is in a "pipe, tank, or cistern", (however interestingly this concept has not been extrapolated to be included in other definitions, such as "contaminants").

Consequently discharges of stormwater that occur directly into water that is in a piped stormwater system is not a discharge to water and therefore does not require authorisation under Section 15(1)(a) of the RMA. Similarly while the water is contained within the pipe network components, including impervious stormwater holding tanks or similar treatment devices, it does not require authorisation. It is the discharge from the network, including the parts of a stream that are included as part of the network, that requires authorisation by EW. This means that discharge permits (or permitted activity rules) for TA piped stormwater systems need to account for all of the stormwater inputs (from a volumetric perspective at least) to the piped system to make sense of the ultimate discharge.

There are a number of legal opinions (including one from Ian Cowper for the ARC) that discharges to stormwater systems can be managed as discharges to land, the pipe not being water or air. However, focusing on this issue detracts from the more important fact that, prior to entering the piped system contaminant discharges occur onto impervious and/or unsealed surfaces at industrial sites (i.e. onto land for the purposes of the RMA). These discharges occur in a position where the contaminants (or contaminants emanating from them as a result of natural processes) may get into water, in most circumstances mobilised by incident rainfall leading to stormwater runoff. This scenario appears to fit snugly into the intent of Section 15(1)(b) or 15(1)(d). To take the contrary view that hard man-made surfaces are not land would lead to the perverse conclusion that the law drafters did not envisage rainfall runoff leading to the mobilisation of contaminants (and this would be contrary to the concept of "may get into water").

In any event a critical consideration is the point at which the site owner/operator loses control of the discharge. In the case of industrial sites this has occurred at the point when poor site management activities lead to contaminant releases onto hard surfaces. While it is practicable to gain control again prior to the contaminant, mobilised and diluted by rainfall, leaving the site via the formed stormwater drainage network, this would require the installation of a containment device like a tank.

Where the TA accepts the quality of the discharge entering their system, via application and granting of a stormwater network discharge consent by EW, then it is reasonable that the TA should ensure that the quality of discharges entering their system will not lead to a breach of the standards required of their discharge consent. How the TA manages this will depend on the strength (and specificity) of their land use provisions to enable the management of industrial site activities in such a way that prevents stormwater contamination. One alternative appears to be development of a bylaw under the LGA to impose tighter controls on polluting activities (although there is some debate about whether this is a practicable alternative or not – see GWRC's view in Appendix 9).

However, where the TA does not apply for, and therefore does not accept responsibility for, the contaminants discharged by industrial site operators into their stormwater network, it is not reasonable to expect the TA to deal with site owner/operators. It is clear from the RMA provisions that both RC's and TAs have responsibilities regarding site management under S30 and S31 and via S9 and S15. Therefore, it may be that one or other, or both agencies collaboratively will need to deal with inappropriate industrial site management practices.

A2.1.5 Proactive implementation of source control measures

The reactive implementation of controls on industrial sites discharging into municipal stormwater infrastructure is complicated as discussed above. However, in this circumstance a discharge of contaminants can be shown to be occurring contrary to statutory requirements under the RMA if not district or regional planning documents. The ISP[3] programme seeks to proactively assess sites and to ensure that site operators deal with both actual and/or potential problems. The ability to proactively change behaviour and implement preventative source control measures where an effect is only theoretical (such as a cumulative impact) is more difficult.

For the purpose of this report source control measures are taken to be any measures that seek to reduce the risk of stormwater becoming contaminated or ensuring that stormwater leaving a site is a suitable quality, in particular:

- changing the site management approach so that high risk activities (storage, use, transport or disposal of hazardous substances) are no longer undertaken in a position where stormwater is at risk
- changing materials so that lower risk constituents are used in manufacturing processes
- a site environmental management planning to ensure spilled materials are cleaned-up properly
- secondary containment (bunding) of chemicals stored outside
- ensuring vehicle, equipment, plant, or goods wash water goes to the sanitary sewer
- proper separation of wastewater and stormwater and their conveyance systems
- installation of chemical capture and treatment systems or devices tailored to the activities undertaken on the site and likely contaminants being discharged.

There are a number of options available for the statutory delivery of these options to encourage their uptake and where necessary ensure that they occur. These are:

(i) Section 9 rules in district plans
(ii) Section 9 rules in regional plans
(iii) Section 15 rules in regional plans
(iv) RMA Section 15 requirements

(v) TA bylaws controlling discharges to the system
(vi) NES governing stormwater quality
(vii) Transfer of powers to TA enforcement officers
(viii) Transfer of stormwater discharge consenting functions to TA.

A pros and cons analysis of the options listed above is provided in Table A1 below. The issues surrounding the use of s9 and s15 Rules have been previously discussed; however, some background on the other options is provided in Appendix 9.

Table A1 Pros and cons summary

Option	Pros	Cons
District Plan Section 9 Rules Rating ✶✶✶☆☆	Maintains inter-linkage between other land use provisions that the TA specifies for industrial activities TA provides stormwater infrastructure so some responsibility for inputs Places requirements directly on site owner/operator	Even-playing-field to industry sector needs all TAs to have same provisions S10 existing use rights prevent implementation Difficult to ensure implementation occurs simultaneously across the region when it does occur Discharges and effects are RC functions Capability not assured in all TAs (advice, implementation, compliance) Land use controls tend to be generic lacking the industry specific provisions required to protect water quality Resources required for statutory process to get Plan rules in place
Regional Plan Section 9 Rules Rating ✶✶✶☆☆	Even-playing-field to industry sector same provisions regionally Implementation occurs simultaneously across the region Discharges and effects are RC functions Capability assured in RC Places requirements directly on site owner/operator Land use controls can contain industry specific provisions required to protect water quality	S20 existing use rights may prevent implementation Potential linkage between other TA land use requirements lost TA provides stormwater infrastructure so some responsibility for inputs Resources required for statutory process to get Plan rules in place
Regional Plan Section 15 Rules	Even-playing-field to industry sector same provisions regionally Implementation occurs simultaneously across the region Discharges and effects are RC functions Capability assured in RC Places requirements directly on site operator/owner Discharge controls can contain industry specific provisions	Potential linkage between other TA land use requirements lost TA provides stormwater infrastructure so some responsibility for inputs Argument that discharge is authorised by TA network consent A significant amount of resources and time required for statutory process to get Plan rules in place S20 existing use rights may delay implementation

	required to protect water quality	
Rating ✶✶✶✶☆	No existing use provisions unless TRP Rules exist	
Rely on Section 15 only (Note: only arises if TRP or RP silent on the issue of discharge to land from industrial activities)	Even-playing-field to industry sector same provisions regionally Discharges and effects are RC functions Capability assured in RC Places requirements directly on site operator/owner Discharge controls can contain industry specific and site specific provisions required to protect water quality No existing use provisions RMA can be used so no immediate need to get Plan rules in place	Potential linkage between other TA land use requirements lost TA provides stormwater infrastructure so some responsibility for inputs Argument that discharge is authorised by TA network consent so further consents are double dipping Implementation may not occur simultaneously across the region unless adequately resourced A plan change would eventually be required needing a significant amount of resources
Rating ✶✶✶☆☆		
TA Bylaws LGA 2002 (s145, s146) or Health Act 1956 (s64(g))	Enable TA to make specific requirements on site operators discharging contaminants into the TA stormwater network. Potential linkage between other TA land use requirements retained. TA provides stormwater infrastructure so some responsibility for inputs Speed of development and implementation much greater than Plan changes Will ensure that the site operator is made directly responsible for their discharges	Argument that discharge is already authorised by TA network consent so this is double dipping Development and Implementation may not occur simultaneously across the region or to the same standards (even playing field) Significant legal debate about whether the provisions of s64(g) of the Health Act or s145 or s146 of the LGA can be extrapolated to cover stormwater quality issues Lack of specific expertise in developing appropriate requirements to manage stormwater quality effects.
Rating ✶✶✶☆☆		
Authorisation of TA Enforcement Officers (s38)	Enable TAs to make specific requirements on site operators discharging contaminants into the TA stormwater network Speed of development and implementation much greater than Plan changes TA provides stormwater infrastructure so some responsibility for inputs Will ensure that the site operator can be made directly responsible for their discharges	Only intended to deal reactively with discharges not proactive preventative actions Development and Implementation may not occur simultaneously across the region or to the same standards (even playing field) Lack of capability within some TAs will result in different approaches being required across the region. Liability of actions of 'agents' rests with the regional council
Rating for pollution response		

✶✶✶✶☆		
Joint Management Agreement (s36B) Rating ✶☆☆☆☆	TA provides stormwater infrastructure so some responsibility for inputs	Potential for disagreement between agencies over actions Potential for confusion by industrial site operators over who to deal with Duplication of resources and capabilities Requires liaison with the Minister Lack of capability within some TAs will result in different approaches being required across the region.
Delegation of Functions Powers & Duties (s34A(2) Rating ✶☆☆☆☆		Potential for disagreement between agencies over actions Potential for confusion by industrial site operators over who to deal with Duplication of resources and capabilities Lack of capability within some TAs will result in different approaches being required across the region
Transfer of Functions Powers and Duties (s33) Rating ✶☆☆☆☆		Potential for disagreement between agencies over actions Potential for confusion by industrial site operators over who to deal with Duplication of resources and capabilities Lack of capability within some TAs will result in different approaches being required across the region

Appendix 3: Waikato regional planning provisions

A3.1 Relevant WRPS provisions [abridged]

The Waikato Regional Policy Statement is the logical first point of reference for evaluating how people of the Waikato Region have decided that statutory agencies should undertake their responsibilities with regard to the management of stormwater discharges.

Section 2 of the WRPS makes it clear that a partnership approach between EW and the region's TAs was envisaged for situations where joint responsibilities occur, and that where appropriate a transfer of powers was also seen as a possibility, as follows.

Section 2.2.2

Policy Two: Inter-Agency Integration and Cross Boundary Processes

Ensure inter-agency integration and consideration of cross boundary processes in the management of natural and physical resources.

Implementation Methods: ……..

8) Encourage joint resource management projects with territorial authorities, neighbouring Regional Councils, iwi authorities and other resource management agencies where there are clear benefits to all parties.

9) Consider the transfer of powers or the delegations of functions to public authorities where appropriate.

Section 3.3.8 Soil Contamination recognises that the discharge of contaminants onto or into land may adversely affect the physical, chemical or biological condition of the soil. The associated policy seeks to ensure that discharges of contaminants into or onto land are carried out in a sustainable manner. While this section does not specifically point to industrial sites and poor management practices as the sources of soil contamination there is ample evidence that this occurs on unsealed industrial sites.

Sections 3.4.4 Significant Resource Management Issues and **3.4.5 Water Quality** both recognise the importance of non-point source discharges of contaminants, including stormwater as major contributors to the degradation of water quality in the region, particularly via cumulative impacts.

Section 3.9.3 Liquid Wastes further highlights "*Industrial effluent includes stormwater from industrial sites*" and that these sources are "*Significant liquid waste discharges requiring treatment and/or disposal in the Region*".

The existence of joint responsibilities in terms of the management of hazardous substances is recognised in **Sections 3.10.2, 3.10.3 and 3.10.4** dealing with the Storage, Transportation, Use and Disposal of Hazardous Substances. This section is very important in the consideration of industrial site management as the bulk of stormwater contamination arises at industrial sites due to poor management practices.

The WRPS defines hazardous substances as follows:
"Hazardous substances" *are any substances listed under the Dangerous Goods Act 1974, the Toxic Substances Act 1979, the Pesticides Act 1979 and their associated schedules and regulations or, any substance that has one or more of the following properties:*

a. *an explosive nature*
b. *an oxidising nature*
c. *a corrosive nature*
d. *flammability*
e. *acute, chronic, immediate or delayed toxicity*
f. *environmental persistence/ecotoxicity.*

Characteristics e) and f) are particularly relevant in terms of the impacts of contaminants entrained in stormwater runoff including cumulative adverse effects.

3.10.2 Management of Hazardous Substances

Issue: *Central government agencies, regional and territorial authorities all hold similar responsibilities for the control of adverse effects arising from the storage, transport, use and disposal of hazardous substances. This duplication of roles has the potential to create inefficiencies and/or uncertainty for resource users and the community.*

Objective: *The roles of all agencies responsible for the management of hazardous substances in the Waikato Region clearly identified and their responsibilities consistently implemented.*

Policy One: The Management Of Hazardous Substances

A consistent regime for the management of hazardous substances will be provided throughout the Waikato Region and between the Waikato and neighbouring regions.

Implementation Methods:

1) *The Waikato Regional Council (Environment Waikato) will:*
   - i) *where there are omissions in the management framework (including central government controls) for hazardous substances, develop specific objectives, policies, rules and/or other methods in regional plans for the prevention or mitigation of adverse effects of the storage, use, disposal or transportation of hazardous substances in the coastal marine area and in the beds of rivers and lakes*
   - ii) *where there are omissions in the management framework (including central government controls) for hazardous substances, manage through regional plans and/or resource consents, taking into account codes of practice, the adverse effects of discharges of contaminants into the environment that arise from the storage, use, disposal or transportation of hazardous substances*
   - iii) *advocate and facilitate the development of a consistent regime for the management of the adverse effects of hazardous substances across the Region*
   - iv) *undertake, support and encourage the development and implementation of environmental education programmes that aim to avoid, remedy or mitigate adverse effects related to the storage, use, disposal or transportation of hazardous substances. …..*

Implementation method 1) part ii) in particular points to a possible consenting function being undertaken by EW where there is an omission in the management framework for hazardous substances. In some jurisdictions this might be occasioned by poor management of industrial sites leading to stormwater contamination (or a lack of capability, capacity or willingness within the TA to undertake the stormwater management function). Implementation method 1) part iii) points to a consistent region-wide approach and part iv) provides for the use of proactive education focussed programmes.

3.10.3 Storage, Transportation, Use and Disposal of Hazardous Substances

Issue: *The release of hazardous substances from storage facilities or during their use, transport or disposal has the potential to cause significant adverse effects on the environment and human health.*

Objective: *No significant risk of adverse environmental and human health effects deriving from the storage, transport, use and disposal of hazardous substances.*

Policy One: Storage of Hazardous Substances

Hazardous substances are to be stored in a manner that is designed to avoid adverse effects from unintentional releases.

Implementation Methods:

1) *Through regional and district plans, provide methods that are designed to avoid adverse effects associated with the storage of hazardous substances, including the provision of:*
   - i) *containers suitable for the substance*
   - ii) *correct handling procedures for the substance*
   - iii) *facilities with back-up systems designed to contain unintentional releases*
   - iv) *locations where the level of risk to the community and the environment is low (e.g. away from flood hazard areas, valued ecosystems or residential areas).*

2) *Ensure, through regional and district plans or resource consents that risk assessments and risk management plans are required for sites where hazardous substances are stored so as to avoid the unintentional discharge of hazardous substances to the environment.*
3) *Develop, in conjunction with territorial authorities and other statutory agencies, contingency plans that avoid, remedy or mitigate the adverse effects of hazardous substances accidental releases.*
4) *Use environmental education to advocate the safe storage of hazardous substances.*

The implementation methods under Policy 1 of section 3.10.3 give clear direction regarding appropriate site management practices for the avoidance of adverse effects from contaminant discharges. The way these sections are couched indicates that provisions in the planning documents of both statutory agencies are envisaged. Implementation methods 2), 3), and 4) provide for the involvement of both EW and TA's in managing industrial activities to protect stormwater and support the use of educational material and/or programmes.

Policy Three: Use of Hazardous Substances

Hazardous substances are to be used in a manner that is designed to avoid adverse effects. Where these effects are unable to be completely avoided they will be remedied or mitigated.

Implementation Methods:

1) *Through regional and district plans, provide methods that are designed to avoid adverse effects associated with the use of hazardous substances.*
2) *Ensure, through resource consents and regional and district plans that risk assessments and risk management plans are required for sites where hazardous substances are used.*
3) *Develop, in conjunction with territorial authorities, a database identifying generators and users of hazardous substances.*
4) *Advocate, through environmental education:*
   i) *the adoption and implementation of cleaner production programmes*
   ii) *the use of hazardous substances in a manner that avoids adverse effects.*
6) *Develop, in conjunction with territorial authorities and other statutory agencies, contingency plans that avoid, remedy or mitigate the adverse effects of hazardous substances releases.*

The implementation methods under Policy 3 of section 3.10.3 give clear direction regarding methodologies for the avoidance of adverse effects from contaminant discharges. The way these sections are couched indicates that provisions in the planning documents of both statutory agencies are envisaged. Implementation Methods 4) further supports the development of educational material and its use for advocacy of hazardous material use in a safe manner.

3.10.4 Existing Contaminated Sites

Issue: *The release of contaminants from existing contaminated sites has the potential to cause adverse effects on the environment including human health.*
Objective: *No significant risk of adverse effects on human health or the wider environment from existing contaminated sites.*

Policy One: Management of Contaminated Sites

The adverse effects of existing contaminated sites managed in ways that take into account:
a) the type and scale of the contamination
b) the potential use of the site and associated health or environmental risks
c) available remediation processes
d) the costs of various remediation or management options relative to the environmental benefits gained.

Implementation Methods:

1) *Identify, in consultation with territorial authorities and other relevant organisations, all existing or potentially contaminated sites in the Region and develop a protocol for the proper use and release of this information where such information is known ……..*

Definitions

"Contaminated sites" *are sites at which hazardous substances are present in concentrations above naturally occurring local background levels and are likely to pose an immediate or long term risk to the environment and/or human health.*

Industrial sites that have poor management practices for their storage, transport, use or disposal of hazardous substances have a high potential to become contaminated sites. Contaminants in soils or on hard surfaces have the potential to contribute a significant amount of contamination to surface water bodies when mobilised by stormwater. Therefore the identification and assessment of contaminated land as part of an ISP^3 programme will result in a significant improvement to the quality of stormwater runoff.

A3.2 Relevant PWRP provisions [abridged]

Following on from a review of the provisions of the WRPS the provisions of the PWRP need to be evaluated. The PWRP provisions give force to the WRPS in the form of issues, objectives, policies, rules and implementation methods. Relevant provisions are located in the **Water Module (3)**, in **Sections: 3.1 Water Resources, 3.2 Management of Water Resources,** and **3.5 Discharges**, and in the **Land and Soil Module (5)** in **Sections: 5.2 Discharges onto or into Land,** and **5.3 Contaminated Land**.

3.1 Water Resources

3.1.1 Issue (The following aspects of the issue apply to all activities throughout the Plan):

Point source discharges into water bodies can cause deterioration in water quality and the values for which the water body is being managed.
The cumulative effects of non-point source discharges have a significant adverse effect on the water quality of many water bodies in the Region

The issue of non-point source discharges of contaminants which must include industrial site mismanagement leading to contaminants onto or into land and thereby into stormwater systems. The adverse impacts of the discharge from piped stormwater systems are captured by issue 3.1.1.

3.1.2 Objective: The management of water bodies in a way which ensures:…… .

b. ***net improvement of water quality across the Region the avoidance of significant adverse effects on aquatic ecosystems***

o. *concentrations of contaminants leaching from land use activities and non-point source discharges to shallow ground water and surface waters do not reach levels that present significant risks to human health or aquatic ecosystems*

Objective 3.1.2 (o) in particular, seeks to ensure that land contaminating activities such as industrial or trade premises are managed in such a way that both groundwater and surface water (via stormwater runoff) are protected.

3.2 Management of Water Resources

3.2.3 Policies

Policy 1: Management of Water Bodies

Manage all water bodies to enable a range of water use activities, whilst ensuring that a net improvement in water quality across the Region is achieved over time through: …….

b. Maintaining overall water quality in areas where it is high, and in other water bodies, avoiding, remedying or mitigating cumulative degradation of water quality from the effects of resource use activities.

c. Enhancing the quality of degraded water bodies. …….

Policy 2: Managing Degraded Water Bodies

Enhance the quality of degraded water through improved management of activities that affect water bodies so that:

a. For activities controlled by rules in the Plan:

i. discharges to water will not further degrade water quality with respect to those parameters of the relevant class(es) for that water body that are not currently met……

For activities covered by non-regulatory methods in the Plan, promote:
land management methods that reduce non-point source discharges …….

Urban stream environments draining industrial catchments are generally severely degraded by both hydrological flow regime modification due to changes of imperviousness and consequent runoff characteristics and due to entrained contaminants in the runoff (sediment, elevated temperature and other toxicants). The ISP^3 programme would seem to fit well in terms of Policy 3.2.3 (1) & (2).

3.5 Discharges

3.5.1 Issue: *Refer to 3.1.1* (above for water) *and 5.2.1* (below for land)

3.5.2 Objective: *Refer to objectives 3.1.2* (above for water) *and 5.2.2* (below for land).

3.5.3 Policies

Policy 1: Enabling Discharges to Water that will have only Minor Adverse Effects

Enable through permitted and controlled activity rules, discharges to water that due to their nature, scale and location will:

a. avoid adverse effects on surface water bodies that are inconsistent with policies in Section 3.2.3 of this Plan …….

Policy 1 would enable the development of permitted activity rules in the PWRP (either S9 or S15) to provide for the discharge of stormwater from industrial sites that are not high risk (table 5.1 detailing high risk facilities already appears in the PWRP). Such an approach has been well received by industry in Auckland as it does not duplicate consenting requirements (as it is a PA). A S9 PA, however, suffers from the complication of S10 existing use rights until an actual discharge is proven. A S15 discharge will occur unless the site is completely locked down (plumbed to trade waste for example) or contaminant free (usually only occurs if the site is vacant).

Policy 2: Managing Discharges to Water with More than Minor Adverse Effects

Control, through resource consents, discharges to water that are likely to have more than minor adverse effects so that:

a. *adverse effects on surface water bodies that are inconsistent with the policies in Section 3.2.3 of this Plan are avoided as far as practicable and otherwise remedied or mitigated……..*

Policy 2 would enable the development of controlled or discretionary activity rules in the PWRP (either S9 or S15) to provide for the discharge of stormwater from industrial sites that are high risk (table 5.1 detailing high risk facilities already appears in the PWRP). Clearly the contaminants discharged onto or into land at these sites has the potential to cause significant environmental damage when it is mobilised by stormwater runoff.

Policy 7: Stormwater Discharges

Encourage at-source management and treatment of stormwater discharges to reduce water quality and water quantity effects of discharges on receiving waters.

Explanation and Principal Reasons for Adopting the Policies

Policy 7 *refers to statutory and non-statutory means which Environment Waikato can use to encourage methods of managing stormwater at its source and treating stormwater prior to its discharge to receiving waters. These include the resource consent process and the development and implementation of stormwater management plans. These detail the way in which stormwater networks are operated and include methods to avoid, remedy or mitigate the adverse effects of stormwater discharge.*

Policy 7 is more specific about focussing on source control measures as the best way to manage the quality of stormwater discharges. As stated elsewhere in this report, extensive experience in New Zealand and overseas has shown that source control by itself is seldom enough to provide long term protection from unacceptable stormwater discharge quality. The development of stormwater management plans is an essential component to protecting stormwater quality; however, to be truly effective they must be site specific and tailored for the industrial sector operating on the site. Furthermore as discussed elsewhere the ability of TA's to manage the discharge to a piped network by a third party is considered to present some practical difficulties.

3.5.4 Implementation Methods – Discharges

3.5.4.1 Environmental Education

Environment Waikato will, through environmental education programmes:

3. *Raise awareness of the adverse effects of:*
   a. *urban stormwater discharges on water quality*
   b. *household water introduced into stormwater systems.*

3.5.11 Implementation Methods – Stormwater Discharges

3.5.11.1 Good Practice

Environment Waikato will, in conjunction with territorial authorities, organisations, industry groups and individuals discharging stormwater, provide guidance to develop and implement good practices or appropriate codes of practice.

Educational components of the ISP[3] programme fall neatly under the ambit of Implementation Methods 3.5.4.1 Environmental Education programmes for both industry and the community and 3.5.11.1 Good Practice for industry specifically to protect stormwater.

3.5.11.2 Integration with Territorial Authorities

Environment Waikato will work with territorial authorities to ensure the integrated management of stormwater in the Region by:

1. *Ensuring territorial authorities inform Environment Waikato of significant resource consent applications that are likely to adversely affect the quality of stormwater discharges.*
2. *Ensuring Environment Waikato has input into district plan development and reviews.*
3. *Working with territorial authorities to identify and manage contaminated sites.*

3.5.11.3 Stormwater Management

Environment Waikato will work with resources users (including territorial authorities) to:

1. *Find ways to mitigate adverse effects of existing stormwater discharges;*
2. *Promote the development of stormwater management plans which record the way in which the stormwater network is operated, including methods to avoid, remedy or mitigate the adverse effects of stormwater discharge; and*
3. *Promote alternative methods for the treatment and disposal of stormwater from existing and new subdivisions and development.*

Implementation Methods 3.5.11.2 and 3.5.11.3 outline some of the mechanisms whereby TA and EW responsibilities for stormwater quality will be managed in particular stormwater management plans. As stated earlier, experience from elsewhere indicates that site specific and industry targeted plans are essential to be effective.

3.5.11.4 Permitted Activity Rule – Discharge of Stormwater to Water

The discharge of stormwater to surface water (including geothermal water) is a ***permitted activity*** *subject to the following conditions:*

a. *The discharge shall not originate from a catchment that includes any high risk facility**1**, contaminated land*, operating quarry or mineral extraction site unless there is an interceptor system* in place.*
b. *Any erosion occurring as a result of the discharge shall be remedied as soon as practicable.*
c. *The catchment shall not exceed one hectare for discharges that originate from urban areas.*
d. *There shall be no adverse increase in water levels downstream of the discharge point which causes flooding on neighbouring properties, as a result of the discharge.*
e. *The discharge shall comply with the suspended solids standards in Section 3.2.4.6.*
f. *The discharge shall not contain any material which will cause the production of conspicuous oil or grease films, scums or foams, or floatable suspended materials at any point downstream that is a distance greater than three times the width of the stream at the point of discharge.*
g. *The discharge shall not contain concentrations of hazardous substances that may cause significant adverse effects on aquatic life or the suitability of the water for human consumption after treatment.*
h. *There shall be no discharge to any Significant Geothermal Feature.*

A few comments on some perceived deficiencies in conditions a. to h. of this rule

Condition a. The list of high risk facilities is reasonably comprehensive (see Section 3.5.12 below); however, the generality of the terms used (lack of specificity) may lead to debate about whether an Industrial or Trade activity is included as high-risk or not. A comparison between risk rankings between ARC, EW and MfE can be found in Appendix 1. Reference to an interceptor system in place presumably refers to the high-risk industrial site rather than the catchment however without knowing the type of industry and site management practices employed an interceptor system may not be sufficient. The efficient operation of the interceptor system is totally dependent on maintenance. The reference to contaminated land as a contributor was inspired however what happens when contaminated land is identified, is there a feedback loop requiring consideration of stormwater issues?

To avoid a mistake made in the Auckland ALW Plan some reference should be made to combinations of activities as some sites will undertake more than one activity which is a risk to stormwater quality. A number of medium risk activities together may collectively reach a critical risk threshold.

Condition b. Erosion as a result of the discharge will be a recurrent event and the rule should refer to preventative action resulting so that further erosion does not reoccur.

Condition c. Limiting the contributing catchment to 10,000 m^2 will result in many polluting industries slipping under the radar.

Condition f. Is couched in such a way that stormwater discharging from many industries, listed as medium or low risk in Table 5.1, will not comply with this requirement. The definition of the point at which reasonable mixing would be assumed to have occurred (three times the width downstream of the point of discharge) is interesting compared to that used by the NRA in the UK which is: 30 times the width downstream and one third across.

Condition g. This condition also means that most sites that would be of concern will be excluded from being permitted activities.

For the purposes of conditions a) and g) levels of hazardous substances in stormwater or sediments that comply with the following guidelines and standards, in relation to the substances that they address will be deemed to be complying with the conditions:

i) Licences under the Hazardous Substances and New Organisms Act 1996 for the use of the substance in New Zealand specifying discharge and receiving water standards for the substance.
ii) Health and Environmental Guidelines for Selected Timber Treatment Chemicals (Ministry for the Environment, Ministry of Health, 1997).
iii) Environmental Guidelines for Water Discharges from Petroleum Industry Sites in New Zealand (Ministry for the Environment, 1998).
iv) Guidelines for Assessing and Managing Contaminated Gasworks Sites in New Zealand (Ministry for the Environment, August 1997).
v) Australian/New Zealand Water Quality Guidelines For Fresh And Marine Waters, (Australian & New Zealand Environment & Conservation Council, 2001).

For the purposes of this Rule, 'urban area' includes the inner city or town and built up environments, irrespective of local body administrative boundaries, that are serviced by roads where the speed limit is 80 kilometres an hour or less.

A few comments on some perceived deficiencies in the guidelines referenced. In general the rule refers to stormwater and sediments, some of the guidelines referenced refer to neither.

i) There are very few such licenses currently under HSNO
ii) The timber treatment guidelines set safe limits for site soils but that is not the same as stream sediments.
iii) The petroleum Industry Guidelines are not protective of small stream systems and are mainly set up for Heavy end TPH like lubricating oil rather than the toxic constituents of petrochemical blends, like the BTEX compounds in petrol.
iv) The ANZECC 2001 guidelines require a lot of interpretation and the acceptable level of contaminants depends heavily of the degree of compromise in the receiving water body.

Note: Permitted Activity Rule 3.5.11.5 & Controlled Activity Rule 3.5.11.6 – Discharge of Stormwater Onto or Into Land have been deliberately omitted as not adding further to the debate

3.5.11.7 Controlled Activity Rule – Discharge of Stormwater Into Water

The discharge of stormwater to surface water (including geothermal water) that is lawfully established at the time of notification of this Plan (28 September 1998) and does not comply with Rule 3.5.11.4 is a ***controlled activity*** *(requiring resource consent) subject to the following standards and terms:*

a. *The discharge shall not contain concentrations of hazardous substances that are causing significant adverse effects on aquatic life or the suitability of the water for human consumption after treatment.*

Waikato Regional Council reserves control over the following matters:

i Measures used to control erosion or flooding.
ii Measures to avoid, remedy or mitigate the effects of the discharge on the receiving water bodies.
iii Measures for avoiding, remedying or mitigating the effects of maintaining stormwater treatment systems.
iv Information and monitoring requirements.
v *The degree of compliance with discharge or receiving water standards for any hazardous substance in relevant New Zealand Standards, Guidelines or licences issued under the Hazardous Substances and New Organisms Act 1996.*

Comments: This rule is very permissively couched in that EW has to prove that a significant adverse effect on aquatic life is occurring before forcing a site to adopt a treatment regime as a consent requirement. This may prove very difficult where there is a massive receiving environment like the Waikato River providing dilution.

Limiting compliance with discharge standards to HSNO doesn't provide much to work with and given the PA also refers to ANZECC it is somewhat surprising this was not also referenced.

3.5.11.8 Discretionary Activity Rule – Discharge of Stormwater

The discharge of stormwater into water, and/or into or onto land which does not comply with Rules 3.5.11.4, 3.5.11.5, 3.5.11.6 and 3.5.11.7 is a ***discretionary activity*** *(requiring resource consent).*

The wording of these rules does not seem to preclude EW requiring any site owner operator of a high risk site from applying for a resource consent. Where significant discharges to stormwater occur resulting in an adverse effect on water quality any industrial or trade premises could be required to apply. However, the following narrative provides more detail regarding the TAs as the parties that should have a greater involvement in ensuring that stormwater remains relatively uncontaminated.

Explanation and Principal Reasons for Adopting Methods 3.5.11.1 to 3.5.11.8

The non-regulatory methods for stormwater management implement Policy 7 by encouraging at-source management and treatment of stormwater prior to its discharge to receiving waters. ***Method 3.5.11.1*** *supports initiatives to develop, implement and manage stormwater discharges, for example, codes of practice, guidelines, environmental management systems, best practicable options and good practices. The oil industry is one that has produced a detailed code of practice that addresses management of stormwater discharges from service stations. Other treatment options for stormwater include the use of grassy swales, sumps or artificial wetlands, and the diversion of the 'first flush' into trade waste systems.*

Methods 3.5.11.2 *and* ***3.5.11.3*** *promote the need for integrated management of stormwater with territorial authorities. Given that territorial authorities own and manage the large majority of stormwater systems in the Region, they are clearly very influential in terms of the standards and technology adopted. If Environment Waikato wishes to bring about improvements in these areas, it needs to work with territorial authorities and have regard to the practical constraints which exist and the communities' ability to pay for improvements…….*

*3.9 Non-Point Source Discharges**

3.9.4 Implementation Methods – Non-Point Source Discharges

3.9.4.1 Good Practice

Environment Waikato will encourage the use of good practice in land use activities and practices that reduce non-point source discharges. Environment Waikato will, in conjunction with organisations and industry groups, provide guidance in the development, implementation and review of good practice guidelines and codes of practice for land use activities which cause non-point source discharges.

3.9.4.2 Environmental Education

Environment Waikato will, through environmental education programmes, raise the awareness within the community about appropriate land management practices and streamside management

***Method 3.9.4.2** provides that Environment Waikato will use environmental education programmes to raise the community's awareness regarding non-point source discharges and land use effects on water bodies.*

The implementation methods specified for land use activities that create non-point source discharges of contaminants point toward the intention that an integrated ISP[3] programme should be developed for the Waikato region.

3.9.4.3 Integration with Territorial Authorities

Environment Waikato will work with territorial authorities to promote:

1. *management options which seek to avoid or minimise the adverse effects of nonpoint source discharges into water,*
2. *integration of regional and district plans for land use which have potential adverse effects on water bodies,*
3. *a co-ordinated approach to stormwater management and land use activities in areas with degraded water bodies.*

***Method 3.9.4.3** promotes integrated management between Environment Waikato and territorial authorities. This is important because, although Environment Waikato has a direct role in managing water quality, territorial authorities control the effects of land use under s31 of the RMA, and to this extent, Environment Waikato and territorial authorities need to work together to jointly manage this issue.*

The explanation of Method 3.9.4.3 is technically correct; however, an additional interpretation has been discussed in Appendix 2. While TAs are the primary authorities controlling the effects of land use under S31 regional councils have similar functions under S30, particularly where the land use practices lead to contamination of groundwater and/or surface water. It is also important to note that regional councils have the opportunity of using S9 of the RMA to manage the effects of the use, storage, transportation or disposal of hazardous substances, just as TAs do.

5.3 Contaminated Land

***5.3.1 Issue:** The discharge of contaminants from contaminated land can cause the following adverse effects:*

a. *acute toxic effects on human health through ingestion of contaminated material or inhalation of volatile chemicals and particulate matter*
b. *bioaccumulation of contaminants in flora, fauna and humans, causing chronic health effects*
c. *degradation of water quality and aquatic ecosystems*
d. *objectionable levels of odour …..*

***5.3.2 Objective**: Discharges of contaminants from contaminated land shall be managed so that they:*

a. *do not present significant risk of chronic or acute toxic effects on human health, flora or fauna due to the contamination of soil and ground or surface water*
b. *do not have adverse effects on water quality or aquatic ecosystems that are inconsistent with the water management objectives in Section 3.1.2 …….*

This issue links closely with the prevention of stormwater contamination at industrial or trade premises as the causes of both are the same, poor site management practices. The proactive assessment of high-risk industrial sites has been shown as an effective tool in the identification of site contamination, through both officer observation and targeted sampling (of stormwater catch-pit sediments). For some high risk industries nearly 100% of sites required further investigation and/or remediation following the initial proactive visit. On average 3-5 actual discharge problems are identified and 5-8 potential problems waiting to happen.

5.3.3 Policies

Policy 1: Priorities for the Management of Contaminated Land

List and prioritise land uses that present significant risk of contamination and give priority to managing those with the greatest risk.

Policy 2: Significant Risks

For the purpose of Chapter 5.3 the significance of risks associated with a particular site will be assessed on the following basis:

a. *Any numerical standards provided by relevant nationally recognised guidelines.*[1]
b. *In the absence of relevant national guidelines, numerical standards determined in other internationally recognised guidelines that are prepared using the same methodologies as those prepared by the Ministry for the Environment.*
c. *The current or proposed land use and any restrictions on future uses of the site.*
d. *The proximity of the land to sensitive ecosystems and the sensitivity of those ecosystems to the contaminants.*
e. *The existence and characteristics of possible exposure pathways for the contamination.*
f. *The level of contamination in soil and water at the site, potential for discharges to air and the characteristics of the contaminants.*
g. *The degree and nature of discharges from the site.*
h. *The geological nature and history of the site. ……*

Policy 4: High Priority Land Uses and Confirmed Contaminated Land

Ensure that any discharges from high priority land uses and confirmed contaminated land do not present a significant risk of adverse effects.

Policy 5: Other Potentially Contaminated Land

Ensure that resource users are aware of the risk associated with contaminated land and the steps required to manage these risks.

5.3.4 Implementation Methods – Contaminated land

5.3.4.1 Partnerships

Environment Waikato will work with:

1. *individual land owners, other liable parties, territorial authorities, public health boards and other relevant agencies to develop strategies for managing the risks on contaminated land,*

5.3.4.2 Environmental Education

Environment Waikato will, through environmental education programmes, provide land owners with information and advice on:

1. *the best means to avoid or remedy any potential effects of land contamination,*
2. *techniques for undertaking contaminated site assessments,*
3. *the options for remediation and long term management of their sites.*

5.3.4.4 Investigation and Remediation

Environment Waikato will:

1. *undertake appropriate desk top investigations (including analysis of old aerial photos and records of chemical use, enforcement action and affidavits) of sites where high priority land uses have occurred in the past. Priority for investigation will be given to those orphaned sites* that pose the most significant risk of adverse effects,*

These policies and implementation methods in tandem with those relating to stormwater contamination provide a strong platform for the development of an ISP[3] programme that:

- Focuses on current industrial activities;
- Targets the highest risk activities in terms of pollution potential;
- Focuses on highly toxic substances;
- Considers pathways for off-site migration via stormwater (or groundwater); and
- Uses receiving environment sensitivity as a final filter (for determining auditing priority).

5 Land and Soil Module

5.2 Discharges Onto or Into Land

5.2.1 Issue: *The discharge of wastes and hazardous substances into or onto land can cause:*

a. contamination of soils with pathogens, heavy metals, pesticides, hydrocarbons and other persistent hazardous substances to levels that:
(i) ***present significant risks to human health or the wider environment*** *…..*

c. ***contamination of surface water and ground water with substances such as nutrients, pathogens and persistent hazardous substances to levels that present risks to human health, aquatic habitats and the wider environment through processes such as surface run-off, acid drainage, leaching and ground water percolation*** *…….*

5.2.2 Objectiv*e: Discharges of wastes and hazardous substances onto or into land undertaken in a manner that:*

a. *does not contaminate soil to levels that present significant risks to human health or the wider environment*
b. *does not have adverse effects on aquatic habitats, surface water quality or ground water quality that are inconsistent with the Water Management objectives in Section 3.1.2 …….*

5.2.3 Policies

Policy 1: Low Risk Discharges Onto or Into Land
Enable, through permitted activity rules and non-regulatory methods, the discharge of contaminants onto or into land where:

a. hazardous substances present in the discharge, or produced as a consequence of the breakdown of the contaminants from the discharge:
i. are not environmentally persistent
ii. will not bioaccumulate to a level that has acute or chronic toxic (carcinogenic, teratogenic or mutagenic) effects on humans or other non-target species ……..

d. The discharge will not result in any effect on water quality or aquatic ecosystems that is inconsistent with the purpose of the Water Management Classes as identified by the policies in Section 3.2.3

Policy 1 (when applied to industrial site practices) assumes that the operators of industrial or Trade premises understand the potential adverse effects that the materials (contaminants) the discharge to hard surfaces on their sites can have on aquatic environments. Furthermore it assumes that they know where their drainage systems actually go and the quality of the receiving environment that they discharge into. On both counts this is extremely unlikely.

Policy 2: Other Discharges Onto or Into Land
Manage discharges of contaminants onto or into land not enabled by Policy 1, in a manner that avoids, where practicable, the following adverse effects and remedies or mitigates those effects that cannot be avoided:

a. *contamination of soils with hazardous substances or pathogens to levels that present a significant risk to human health or the wider environment*
b. *the discharge is not inconsistent with policies in Section 5.1.3*
c. *any effect on water quality or aquatic ecosystems that is inconsistent with the purpose of the Water Management Classes as identified by the policies in Section 3.2.3*

Section 3.5.12 - High Risk Facilities, which is tabulated information has been used as the basis for table A1 in Appendix 1**.**

Appendix 4: Hamilton City Proposed District Plan (HCPDP) [abridged]

The following provisions have been extracted from the HCPDP it is not intended to provide an exhaustive coverage of relevant provisions in the Plan relating to industrial site management and some relevant references may have been inadvertently omitted.

Objective 6.5.2 Management of Environmental Impacts

To avoid or mitigate adverse environmental effects generated by industrial activities on the receiving environment, adjacent sites, the local community, public places and non-industrial areas.

Policies

(c) Ensure that the location, design construction and operation of hazardous facilities, in industrial areas avoids or mitigates adverse effects on the receiving environment particularly in relation to any Environmental Protection Overlay

Reasons

It is necessary to manage adverse effects of activities on the receiving environment in industrial areas so as to maintain and enhance the quality of the environment for both present and future generations. The protection of the environment from harm or irreversible damage is important for the quality of land, air and water and the natural functioning of ecological systems.

The control of discharges to the ground, air and water is the responsibility of the Regional Council. However, impermeable surfaces and stormwater infrastructure should be designed and managed in a way that avoids adverse impacts on water quality arising of stormwater from industrial areas into the City's watercourses …….

All activities involving the use, storage, transportation and disposal of hazardous substances have the potential to cause adverse effects on human safety and the receiving environment. This potential risk will be managed through the use of the Hazardous Facilities Section of the District Plan.

The objective and policy provide some very general guidance regarding the management of the adverse effects of industrial site use and warns of the consequences poor site management. HCC's view of the statutory role of EW is also clearly articulated.

9.6 Hazardous Substances

Introduction and Issues

The use storage and manufacture of potentially hazardous substances is an integral part of the normal activities of the city. These substances whether singularly or in combination have the potential to affect the health and safety of the community, and the sustainability and well-being of the local natural and physical environment…….

Council has responsibility under the RMA to control any actual or potential effects of the use, development or protection of land including the prevention and mitigation of any adverse effects of the storage, use, disposal or transportation of hazardous substances…..

Objective 6.6.1 Hazardous Substances

To allow the continued use of hazardous substances while ensuring the adverse environmental effects of the use, storage, disposal or transportation of hazardous substances are avoided, remedied or mitigated.

Policies

(a) Control activities involved in the use or storage of single or multiple hazardous substances in a manner which reflects the level of risk posed by the substances to the community and the environment……

(c) Control the design, construction and operation of facilities employing significant quantities or types of hazardous substances on order to minimise the risk of adverse effects on the environment and on people's health and safety.
(d) Ensure the appropriate facilities are in place to avoid the pollution of soil, groundwater, watercourses and air in the event of accidents (such as spills, gas escapes, etc) involving hazardous substances…….

These policies in tandem clearly point to the responsibilities that HCC have under S31 of the RMA for the control of hazardous substance use, storage, transport and disposal. They are couched in such a manner that restrictions on the establishment of new sites would be relatively straight forward. Policy (a) above also relates to existing 'activities' however as discussed elsewhere existing use rights would hamper the imposition of more stringent requirements on such operations.

The hazardous substances objectives and policies are implemented through the 'Hazardous Facilities' Rules which are designed to ensure that the level of control is commensurate with the scale of likely environmental effects. Non-statutory methods such as education, codes of practice and guidelines and industry codes are also referenced.

The Plan rules require resource consent for sites where hazardous substances are present in excess of certain thresholds. Calculation of whether a land use consent is required or not appears to be very complicated and require knowledge about the properties of hazardous substances that can be fed into a decision support matrix. Properties examined are: flammability, explosiveness, oxidation potential, corrosiveness, toxicity (people), and ecotoxicity. Where the threshold is exceeded a land use consent is required to establish the activity (unless a sensitivity zoning precludes it from being established). Any site requiring a consent is required to submit an assessment of environmental effects that addresses the following [abridged]:

Appendix 3.2-III Assessment of Environmental Effects

i The proposed site operation and layout;
ii Quantities of hazardous substances used and stored, and proposed facilities;
iii Site drainage and off-site infra-structure;
iv Transfer/transport of hazardous substances on and off site and selection of least risk routes;
v The sensitivity of the surrounding human, natural and physical environment and proposed measures to protect them;…….
vi Proposed contingency measures and emergency plans;
vii *Proposed monitoring and maintenance schedules.*

In addition to the above there are general rules about industrial activities that fall under the threshold of the hazardous substances provisions as follows:

Activities

a. Permitted Activities

The following are Permitted Activities provided they comply with the standards in Rules 4.5.2 and the relevant standards in Rule 4.5.3:

- *Any Industrial Activity …….*

4.5.2 General Standards

e. Service and Outdoor Storage Areas
ii) Where any area is used for the outdoor storage of goods it shall comply with the following:…..
- *Any material stored outdoors shall be done in a manner that avoids adverse effects beyond the boundaries of the site, or impacts on the receiving environment.*

These provisions are particularly relevant of sites that would be considered 'low' or 'moderate' risk from the perspective of environmental threats. They could be used be used now for new sites being established, to ensure that materials, goods or waste products are stored under cover. Again imposing this requirement on existing activities will experience the problems

relating to existing use rights that have been previously discussed. There are a large number of other activities carried out on low and moderate risk industrial sites, such as vehicle, equipment or product washing, which the Plan does not mention and by inference are permitted.

Appendix 5 Pollution prevention auditing data

A5.1 Manukau Harbour Action Plan 1987-1990

The MHAP was the programme that started the ARC down the track of forming a pollution prevention programme and stand-alone proactive auditing team.

The programme had three urban pollution control officers dedicated to proactive auditing of the nearly 3,000 industrial sites that occur within the catchment. All industrial sites were initially visited although after the first annual review a list of no-risk activities, such as administrative buildings was compiled and these were simply noted on the database but not assessed.

The study confirmed for the ARC what sorts of industries should be categorised as: no, low, moderate and high risk sites based on their pollution potential.

The following table demonstrates the extent to which pollution problems were found to be occurring, that would lead to stormwater contamination, when sites were first audited by the proactive team.

Risk Category	Industry Type	Number of Sites	No. with Problems (%)
Moderate	Light Engineering	184	51 (28%)
	Panel beaters & Spray Painters	140	43 (31%)
	Motor Vehicle Servicing	281	111 (40%)
	Medium Engineering	89	37 (42%)
High	Petrol Stations	25	9 (36%)
	Pesticide Manufacture	2	1 (50%)
	Timber Treatment	4	3 (75%)
	Electroplaters & chemical platers	22	16 (73%)
	Oil and solvent re-refining	5	5 (100%)
	Fat extraction, tallow and fellmongeries	7	7 (100%)
	Non-ferrous metal works	5	5 (100%)
	Bitumen & Tar	4	4 (100%)
	Glue & Starch	4	4 (100%)
	Detergent & Disinfectant	4	4 (100%)
	Recovery/recycling	3	3 (100%)
	Vehicle Assembly	3	3 (100%)

A5.2 Span Farm area blitz

Span Farm in West Auckland is a classical example of the sorts of mixtures of industrial types that you typically get in Auckland industrial enclaves.

There were 139 sites audited of which only 115 were industrial sites (31 high, 54 moderate and 30 low risk), based on the information produced by the MHAP referenced above.

	Number High Risk	Number Moderate Risk	Number Low Risk
Actual	10 (32%)	17 (31%)	6 (20%)
More than 1 actual	1	4	3
Potential	19 (61)	32 (59%)	9 (30%)
More than 1 potential	8	12	2
Total Number of Sites	31	54	30

The 115 industrial sites audited requiring a total of 61 hours of officer time spread over an 8 day period.

Major pollution problems identified were:

- Washing equipment, premises, or vehicles to stormwater;
- Poor storage of chemical containers;
- Material spillage onto yard and into stormwater;
- Leaking waste bins;
- Uncovered/uncontained waste storage;
- Site soil contamination;
- Lacking in staff awareness, training equipment for spills etc.

A5.3 Homai Stream catchment

There were 52 sites audited (28 high, 13 moderate and 11 low risk), a higher proportion of high-risk sites occurred in this catchment than elsewhere the ARC has audited, as it is zoned for predominantly heavy industry.

	Number High Risk	Number Moderate Risk	Number Low Risk
Actual	14 (50%)	7 (54%)	2 (18%)
More than 1 actual	6	2	2
Potential	21 (75%)	12 (92%)	4 (36%)
More than 1 potential	5	0	1
Total Number of Sites	28	13	11

These results are generally at odds with other area blitzes conducted by the ARC's PCT which found that low risk sites seldom had even potential problems and moderate risk sites seldom had actual pollution problems. The reasons for these differences were never fully discovered although the Homai Stream was severely degraded at the time the survey started and this may have served to desensitise people to seeing it polluted and therefore not calling the pollution hot line when discharges were observed.

A5.4 Silverdale area blitz

Silverdale is an industrial/commercial hub straddling the Wieti River, just to the south of Orewa Township in Rodney District. The mixture of industrial/commercial land uses might be considered typical of a small township elsewhere.

There were 154 sites audited (28 high, 74 moderate and 52 low risk), a higher proportion of low and moderate risk sites occurred in this catchment as was found with most other industrial enclaves within outlying townships the ARC has audited.

	Number High Risk	Number Moderate Risk	Number Low Risk
Actual	12 (43%)	23 (31%)	2 (4%)
More than 1 actual	4	8	0
Potential	15 (54%)	25 (34%)	7 (13%)
More than 1 potential	5	12	1
Total Number of Sites	28	74	52

The findings of this survey would be fairly typical in terms of the spread of actual and potential problems considering risk categories. The low numbers of actuals or potentials at low risk sites helps to reinforce the robustness of our industry risk ranking system. While the moderate risk sites did have a high percentage of actual and potential problems these are somewhat balanced by the effects that would occur as a result of discharges to the receiving environment.

A5.5 Hamilton context

To give some context to the numbers provided by the Auckland survey reports, a comparison has been made with the numbers of these industrial activity types within the Hamilton City area of the Waikato region. For the purposes of this report the number of sites listed in the Yellow Pages for the Waikato region has been used. This might result in an under-representation for some industrial types as some may not advertise their business in this manner or they may undertake some activities as part of their businesses that they do not advertise.

Industry Type	Number in Hamilton
Electroplaters and Chemical Platers	5
Scrap Metal Dealers	14
Automotive Dismantlers	35
Recycling General	2
Waste Removal (liquid and/or solids)	13
Bitumen & asphalt	3
Oil Re-refining	1
Panel beaters & Spray Painters	55

Even considering this limited subset of high risk industry types the magnitude of the auditing challenge for the ISP^3 programme in the Hamilton area alone is staring to become clear.

Appendix 6 Small site audit form

Business Name: _____

Officer: _____ **Visit Date:** _____ **Site ID#:** _____

Business Type; _____ **Code:** _____ **EPR#:** _____

Street # / Name: _____ **Suburb**

Catchment: _____

TA: _____ **Site File #:** _____

Postal Address: _____

Env. Contact: _____ **Designation:** _____

Phone #: _____ **Director/Gen Mgr:** _____

Fax: _____ **24 Hour Contact /** #: _____

Brief description of operations / activities carried out on-site / by company:

_____

_____

1. FACILITIES, EQUIPMENT & OPERATIONS CHECKLIST

Any of the following occurring on the site?	Potential Issues
✒ Compressor / Boiler	Condensate / Blowndown
✒ Vehicle / equipment washing	Where / Design / Disposal
✒ Maintenance of vehicles, equipment etc	Where, disposal?
✒ Cleaning/degreasing parts, floors etc	Where, disposal?
✒ Loading / unloading / decanting areas	Bunding / Spills
✒ Refuelling area	Spills / Cleaning
✒ Fume/dust extraction	Waste storage / Disposal
✒ Metal Coating	Type, containment, wastes?
✒ Chemical treating, processing	What, disposal?
✒ Processes Producing?	
Wastewater	Disposal / Treatment?
Air Emissions	Consent?
✒ Painting / Printing	Where?

2. SITE CONTAMINATION / UNDERGROUND STORAGE

What are the known previous uses of site? _____

Underground storage tanks on-site currently / historically? **Y/N**

Contents _____ **Age:** _____

When removed: _____ **Supplier:** _____

3. SPILL RESPONSE PLAN

1) **Comprehensive - staff fully trained, signage, equipment stored near "hotspots"** ☐
2) **Inadequate - plan in place but not complete** ☐
3) **None - no plan in place** ☐

Comment:_____

4. STORMWATER DISCHARGE

Council Reticulation ☐ **Soakage** ☐ **Natural Water** ☐ **Other**_____

5. MATERIALS / CHEMICALS / WASTES

- **Do you have DG Licence?** ☐ **Any priority pollutants on-site? (details in Table)** ☐
- **Storage of wastes** ☐ **Disposal details:**_____

CHEMICAL / WASTES INVENTORY

Material / Chemical	Container	Volume	Numbers	Storage*

Container: BT = Bulk tank D = drums M = Mini BT C = Cans / Bottles / Small containers B = Bags UST = UG tank
Storage: B / UB = bunded / unbunded C / UC = Covered / Uncovered P / UP = Paved / Unpaved DG = DG Store

Comment:_____

_____

6. OBSERVATIONS / PROBLEMS

_____

_____

_____

VISIT SUMMARY **Visit Series #:**_____

S/W Contam: **Actual** ☐ #___ **Potential** ☐ #_____ **None** ☐

Site Contam: **Actual** ☐ #___ **Investigation** ☐ # ____ **None** ☐

Education: **Fact sheet** ☐ **EOP** ☐ **Letter** ☐ **Field Letter** ☐

Enforcement: **AN** ☐ **EIN** ☐ **Prosecution** ☐ **Other**_____

Time spent:_____ **Costs Recovered: $**_____ **Reported Date:** ___

7. ENVIRONMENTAL PERFORMANCE RATING (EPR)

Pollution Risk (initial)	**1**	**2**	**3**	**4**	**Housekeeping**	**1**	**2**	**3**	**Spill Plan**	**1**	**2**	**3**
Pollution Risk (final)	**1**	**2**	**3**	**4**	**Housekeeping**	**1**	**2**	**3**	**Spill Plan**	**1**	**2**	**3**

EPR = Pollution Risk x Housekeeping x Spill Plan (higher is worse)

Appendix 7 ISP^3 visual/smells checklist

The following is a modified version and text from the visual/smells check described in the Waicare Manual, Book 3 – The Field Manual.

Most water monitoring groups use equipment to collect information; however, this is not always necessary. Three of our basic senses, sight and smell and 'common', are incredibly powerful when combined and are capable of collecting very useful information about a waterway without any fancy analytical equipment or expensive, time consuming analytical techniques. In fact a basic visual/smells check is advisable for monitoring group before they go anywhere near the water to conduct other tests.

This simple assessment is based entirely on things you can observe and smell. Conducting a visual/smells test is so simple and quick that you could consider doing it regularly, for example, each time you pass a waterway (e.g. walking the dog or going to the dairy) the more often the better. Pollution events can happen in an instant, and early warning of such an event can help minimise the extent of damage and help trace the source more easily.

The areas of the stream to check are:

- water smell
- stream bed
- stream margin
- water appearance
- floating materials.

Each of these five areas of your stream could show the effect of a pollution event. On the record sheet (below) there are criteria for each area that you may wish to use to rate how degraded your stream is. Over time this may also be a useful tool to track recovery.

Water smell

This can be the first warning that something is not right. Ensuring that the smell is actually coming from the stream and not a nearby land based source is important. The classic problem in urban areas is sewage smells venting from the sewer manholes next to the stream being mistaken for pollution of the water itself. Collection of a sample of the water for a better sniff using a bucket or other container will help to confirm the source. Where the stream bed sediment potentially harbours the source of the smell, sticks can be used to stir it up for confirmation. You may be able to think of other simple practical devices that meet your particular sampling requirements. Many other aromas may be wafting around and may prove more difficult to locate. The 'smells' table in the record sheet has grouped common odours into types, but you will no doubt want to add some of your own as you become more familiar with your area.

Stream bed

Look for materials that cover the bed of the waterway, such as sediment, slime or scum, water plants and the colour of the covering material. In particular look for material that appears to be smothering the bed. For example, if the streambed is rocky but is being covered in sediment then record this, and the approximate depth of the covering. Accumulations of organic matter and ' dead' stream life should also be noted.

Stream margin

This part of the stream environment is very important for stream health. The 'bank' may be in a condition that protects the stream from adjacent threats, or it may provide the

pathway for polluting materials to enter the stream. Look for signs of erosion (and whether this is 'fresh'), debris/rubbish, and potential or actual pollution sources. Changes in vegetation should also be noted. There may be other undesirable material on the edge as well - people often use these areas to dump all sorts of junk. Please contact your local TA to advise of the presence of waste or if you have some concern about the presence of pipes or drains that look like a private inappropriate (wastewater) connection.

Water appearance

The two important indicators of stream water appearance to look for are colour and murkiness. Both can vary with flow but it is possible to establish a 'feel' for the acceptable, natural range through frequent observations of a waterway in different conditions. Some colours are obviously unnatural, and water generally clears quite quickly after rainfall ceases, especially in smaller catchments. Persistent murkiness or discoloration should be reported and/or investigated further especially when this occurs during periods of fine weather.

Floating materials

Water is a great solvent but many pollutants do not dissolve or not completely and so remain floating on top. These floating materials can cause serious short-term damage (toxic effects) to stream life and here they persist in the environment, long-term damage. In urban areas these forms of pollution are all too common and are found as oily films, rainbow coloured sheens and globs, scums and foams.

The rating criteria

Although most of the observations are straightforward and can be committed to memory in the field it is well worthwhile recording these on paper when you get home. Reference notes can be helpful when you are looking for change over long periods of time, or are attempting to look for patterns. The visual/smells record sheet can be used, or modified, to record your observations. Identified problems are scored as follows: **2** for a severe problem, **1** for a minor problem and **0** indicates no problem. These values are added to give a total score out of 10, the lower the score the more compromised your stream is by chemical or physical influences. Any severe problem (score of 2) or if you witness a pollution event, immediately reporting it to your local or regional council pollution hotline will help the source be identified and the problem promptly stopped.

ISP^3 Visual/Smells Check - Record Sheet

Catchment Name:		Group Name:
Date:	Time:	Observer/s:

Rainfall duration/intensity: **(tick) None** ☐ **Light** ☐ **Moderate** ☐ **Heavy** ☐

Time since rain: **Within 1 hr** ☐ **Within 24 hrs** ☐ **1-7 days** ☐ **7 days plus** ☐

Observations/ Site Changes (if any since last visit)

SMELL

Sewage and/or grey water
Chlorine/chemical
Petroleum/solvents
Organic – including dead things
Detergent

WATER SURFACE

Oily film/sheen/globs
Slime/algal bloom
Scum/foam/froth

WATER APPEARANCE

Murkiness
Muddy
Unusual colour
Bubbling/frothing

STREAM MARGIN

Erosion
Sewage/toilet paper
Oil/petrol/diesel coating
No/dead vegetation
Litter

STREAM BED

Sediment covering
Slime and/or scum
Colour of covering
Toilet paper/sewage
Dead fish/insects/plants

Rating system:
0 = No obvious presence of any pollutants or water quality problems
1 = Pollutants detectable but minor levels only
2 = Presence of pollutants is clear, certain and identifiable

Date						
Smell						
Water Surface						
Water Appearance						
Stream Margin						
Stream Bed						
Total						

Appendix 8 Greater Wellington Regional Council's take charge quick checklist

Walk around your site and look for signs that contaminants or pollutants have been getting into the stormwater system and other signs of pollution.

Can you see any of these on your site?	**Y/N**
• Stains or corrosion of any surface, including along concrete heading towards stormwater grates or around grates.	☐
• Marks on or near any stormwater grate or stormwater cesspit or materials in them indicating that anything other than clean rain water has got into them.	☐
• Stormwater grates that are blocked with solid material grass, plastic or litter.	☐
• Puddles, discoloration, oil or grease or chemicals on the ground.	☐
• Leaking or corroded equipment, valves, seals, containers or lines.	☐
• Areas where absorbent materials (kitty litter, sawdust) have been used to clean up a spill but have not been removed.	☐
• Outdoor bunds where stormwater valves have been left open or are not securely locked.	☐
• Ltter or waste thrown behind buildings, over fences, onto foreshore or river banks.	☐
• Containers that are stored in the open, for example:	
➢ empty containers (unless well washed, these still contain residues that should not be allowed to get into stormwater).	☐
➢ storage tanks or containers showing sign of corrosion or leaks.	☐
➢ torn bags.	☐
• Leaks, overflows or spills from:	☐
➢ tanks or containers left open, with lids off, or unplugged.	
➢ valves, taps, seals, bungs or fittings which are leaking, not properly closed or damaged.	☐
➢ pumps or hose connections.	☐
➢ waste containers or compactors.	☐
➢ drip trays.	☐
• Containers unsafely stacked on top of each other.	☐
• Containers which are not clearly labeled or not labeled at all.	☐

If you answered "YES" to any of the above, you need to:

- find out where the pollutants are coming from and going to and the reason why
- give someone responsibility to stop pollution on your site
- Contact Greater Wellington and ask for 'Take Charge'

Appendix 9: Greater Wellington Regional Council statutory options analysis

Option	GW Comment
Land Use Controls (RMA s.31(b))	Subdivision and earthworks consents can impose controls that control site stormwater, but not the quality of inputs to the stormwater system. (Editors note: There are a variety of reasons why s9 provisions are not favoured as discussed in Appendix 2).
Authorisation of Enforcement Officers (RMA s.38(b))	A regional council can authorise warranted city/district council officers to enforce regional council rules (subject to a delegation). Terms would be defined in a formal agreement, but liability rests with the regional council.
Joint Management Agreement (RMA s.36B)	A regional council can make an agreement with a city/district council to jointly enforce regional council rules if this is the BPO by giving notice to the Minister. The agreement would specify terms, including those of liability & funding.
Delegation of powers (RMA s.34A(2))	A regional council could delegate stormwater enforcement powers to a city/district council. Responsibilities would be defined in the contract, but liability rests with the regional council.
Transfer of powers (RMA s. 33)	A local authority can transfer any function, power or duty to another local authority provided the transfer is "desirable" (as specified by the RMA), and follows the special consultative procedure of the LGA. There is advantage in transferring the function for controlling discharges as regional rules are already operative. Transferring enforcement power for those rules would mean that the regional council would no longer have that power.
Rule Change (RMA s.79)	This process could take several years from initiation to completion, and would not necessarily improve the way in which the rules are enforced.
Nuisance Provisions (Health Act 1956 s.23 & s.29)	Nuisance provisions could be applied where stormwater contamination presents a health risk.
Regulations (Health Act 1956 s.117)	The Minister can make regulations to address a national need. This process would be administered by MfE.
Bylaws (Health Act 1956 s.64(g) & Local Government Act 2002 s.145)	City/district councils can apply to make bylaws but cannot make bylaws for matters already addressed by the RMA.
Memoranda of Understanding / Contracts	Memoranda of Understanding can be used to clarify relationships where there are jurisdictional overlaps or uncertainty. Contracts can define or modify operational relationships. Neither can be used to provide or modify statutory responsibilities or liabilities in law.

The GWRC and Hutt CC MoU outlines the details and limitations of the delegation, how it will be exercised, and responsibilities of both parties, as follows.

1. GWRC will issue nominated HCC officers with a Warrant of Appointment under Section 38(1)(a) of the RMA to carry out the functions and powers of an enforcement officer, specifically: entry for inspection or survey (sections 332 and 333 respectively); require information (section 22); serve an infringement notice

(section 343C); serve an abatement notice (section 322), undertake emergency works (section 330).

2. GWRC will provide training to HCC officers in our investigation procedures, sampling and analysis techniques, incident significance assessment, enforcement procedures, reporting protocols, incidents database, GWRC standard documents and cost recovery policy. All investigations, enforcement action and cost recovery will be conducted in accordance with established Greater Wellington protocols;

3. Both GWRC and HCC officers will share all available information as necessary to ensure an effective and efficient response to stormwater contamination incidents, and accurate reporting of incidents.

4. The HCC investigating officer shall notify the Pollution Control Duty Officer immediately where: a prosecution is likely, GWRC assistance is required or the officer is unsure, if a delegated HCC officer is unable to attend, or if there is a potential conflict of interest.

5. Any enforcement decision will be made by GWRC based upon recommendations from the investigating officer.

6. The operating costs (including equipment, sampling, analysis and legal costs) incurred by each party when implementing the delegation will rest with that party;

7. City council will bear the costs of any investigation and enforcement costs they initiate, and Greater Wellington will remit to them any costs or fines recovered from court action.

8. The delegation will not restrict Greater Wellington's existing powers of investigation and enforcement in the Hutt City district.

9. Potential conflicts of interest will be identified and addressed as part of the delegation process (e.g. incidents involving contaminant discharges by Hutt City Council or its agents).

10. Costs for establishing and administering the delegation would be shared on a 50:50 basis.

Appendix 10: Most common causes of industrial site stormwater contamination

Who is responsible for the clean-up and further prevention of common sources of workplace stormwater pollution? As you will find in the following section the power to change lies within all levels of industrial site operation from the shop floor to the executive board room everyone has their part to play.

Washing vehicles

Vehicles cost a lot of money and most people want their investments to look good, last a long time and potentially act as a good advertisement for the company's products or services. Therefore, vehicles are regularly washed either at a commercial vehicle washing operation or at the company yard or depot. A high proportion of complaints received by water pollution hotlines in both Auckland and Wellington are complaints about either the effects of vehicle washing or people being observed washing vehicles in a manner that runoff will enter a stormwater system or waterway. In the Waikato context a recent survey by Hamilton City Council of car and/or truck washing companies in Hamilton City showed that more than 60% were allowing wash water to discharge to the stormwater system. EW has also recognised the risk of stormwater contamination posed by this sort of activity by listing "Car Wash and Valet Services" in Table 3.5.12 "High Risk Facilities" of the PWRP.

Wastes produced by the washing process include cleaning agents such as degreasers, solvents and detergent, and dirt (sediment), road grime, grease and oil. Where commercial vehicles are used to transport materials there is also the potential for residues from the transported materials to be washed from the vehicle into the stormwater system.

The wastes produced by washing activities can lead to aesthetic (mainly unsightly visual impacts), sub-lethal (avoidance or reduced viability), and cumulative and/or directly toxic effects, including:

- foaming dirty water in roadside gutters or waterways
- sediment in washwater increases 'murkiness' and/or smothers habitat
- an oily layer (or rainbow sheen) on the water surface that can limit oxygen transfer or light penetration
- toxic effects of heavy metals or petrochemicals like diesel or petrol
- detergents sometimes contain phosphates which are a plant nutrient.

Washing materials, products or equipment

There are a number of steps within the storage, use or transportation of an environmentally hazardous substance that result in the need for washing of the raw materials, the products made from them, or there equipment use to make, transport or store them. A high proportion of complaints to pollution hotlines in both Auckland and Wellington can be traced to washwater from these sources.

Like vehicle washwater materials, products or equipment washing can involve the use of detergents, anti-bacterial chemicals, degreasers, acids and other chemicals which can have a toxic effect in their own right. The industry category often involved in complaints in Auckland is food preparation largely due to the strict hygiene requirements imposed by health authorities, leading to frequent wash down. Where human health or hygiene is involved the anti-bacterial agents used are chosen for the lethality of their active ingredients. Often these toxic substances continue to be active long after they have left their site of use to continue to sterilise the waterways they discharge into.

The degree of contamination that occurs from product residues and the potential effects are dependent on the type of product being made and the process involved. Contaminant types and effects range from; sediment generated by washing of bulk root vegetable crops (e.g. potatoes), and oxygen demanding substances from food residues, through to high pH wastewater from concrete use, and heavy metal (zinc) contamination from washing of electroplated metal products.

Inappropriate raw material, product, equipment or waste storage

Poor industrial site management (poor housekeeping practices) is unsightly for customers, unsafe for workers or visitors and leads to discharges of environmentally harmful substances. Proper site management results in pollution prevention without having to think about it. Typical careless housekeeping practices that officers find causing pollution every day are:

- drums, storage or waste containers with no lids getting flooded by rain, washing contaminants onto the ground and into stormwater systems and out to the nearest waterway
- careless decanting of liquids or dripping taps and spigots letting material spill onto the ground and find its way into stormwater
- uncovered outdoor working areas with spills or litter which are not cleaned up, causing pollution every time it rains
- disused equipment stored where rainwater can wash material or waste residues to stormwater
- drip trays overflowing onto yards and into stormwater
- bunded areas with spilled materials tracked around the site by moving equipment (e.g. forkhoists)
- leaky containers left outside because they are 'only leaking a little bit', creating a chronic source of stormwater pollution.

Lack or preparedness for spills

Accidents resulting in the spillage of environmentally hazardous substances happen even in the best workplaces, so staff must be adequately equipped and trained to deal with the likely worst case event. A spill procedure must be designed specifically for every site because each has its own needs and peculiarities of layout, material use and operational practices. Spills that are not cleaned up are a liability in terms of worker safety and a threat to the environment.

To reduce your environmental and occupational liability from spills, you need to:

1. Assess the operation's risk using the following steps.
   a) Create an inventory listing all environmentally hazardous substances stored on your site, including wastes, cleaners or fuels in addition to raw materials and manufactured products.
   b) Clearly and accurately label all environmentally hazardous substances.
   c) Obtain material safety data sheets (MSDS) for environmentally hazardous substances.
   d) Look at high risk areas on your site, where materials are used, handled or stored.
   e) Find out the sites of previous spills (especially repeated occurrences) and determine the cause/s.
   f) Identify the most likely spill and the most serious spill that could occur.
   g) Identify pathways whereby spills can exit the site either to ground soakage or into a formed stormwater system.
   h) Identify water bodies that a spill from your site would reach.

2. Reduce the operation's risk using the following steps.
   a) Ensure your site is designed for your activities and make modify workflow patterns to avoid situations where spillages may occur.
   b) Put in place good housekeeping, inspection and maintenance practices.

c) Know any special handling needs for materials on your site if spilled.
d) Avoid using or storing environmentally hazardous substances where they can be replaced by more benign materials that do the same job.
e) Minimise the generation of environmentally hazardous wastes by using the smallest amount practicable to do the job required (you can always add some more).

3. Future-proof the operation - think ahead about what you need to do BEFORE you have a spill.
   a) Create an emergency telephone contact sheet and post it in a high risk area, where it will be obvious and readily accessed when a spill occurs.
   b) Put educational material, such as a 'spill poster', the specific spill procedure and drainage plan for your site on the wall in a place or places where they are most likely to be needed.
   c) Obtain supplies of containment, clean up, disposal and safety equipment and put them in an accessible place where everyone knows where to find them.
   d) Make it someone's job to replace containment, clean up, disposal and safety equipment when they are used.
   e) Ensure all staff are aware of the potential risks and what to do when there is a problem – hold regular refresher courses, competitions to see who knows procedures etc.
   f) Ensure that staff know that spillages reported and dealt with appropriately won't result in 'punishment' as this is one of the biggest impediments to the proper identification and resolution of problems.