Hastings District Council

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OPEN

A G E N D A

COUNCIL MEETING

Meeting Date: **Tuesday, 9 June 2020**

Time: **1.00pm**

Venue: **Council Chamber**
Ground Floor
Civic Administration Building
Lyndon Road East
Hastings

Council Members	Chair: Mayor Hazlehurst Councillors Barber, Corban, Dixon, Harvey, Kerr (Deputy Chair), Lawson, Nixon, O'Keefe, Oli, Redstone, Schollum, Siers, Travers and Watkins
Officer Responsible	Chief Executive – Mr N Bickle
Manager: Democracy & Governance	Mrs J Evans (Extn 5018)

HASTINGS DISTRICT COUNCIL

COUNCIL MEETING

TUESDAY, 9 JUNE 2020

VENUE: Council Chamber
Ground Floor
Civic Administration Building
Lyndon Road East
Hastings

TIME: **1.00pm**

A G E N D A

1. Prayer

2. Apologies & Leave of Absence

At the close of the agenda no apologies had been received.

3. Seal Register

4. Conflict of Interest

Members need to be vigilant to stand aside from decision-making when a conflict arises between their role as a Member of the Council and any private or other external interest they might have. This note is provided as a reminder to Members to scan the agenda and assess their own private interests and identify where they may have a pecuniary or other conflict of interest, or where there may be perceptions of conflict of interest.

If a Member feels they do have a conflict of interest, they should publicly declare that at the start of the relevant item of business and withdraw from participating in the meeting. If a Member thinks they may have a conflict of interest, they can seek advice from the General Counsel or the Manager: Democracy and Governance (preferably before the meeting).

It is noted that while Members can seek advice and discuss these matters, the final decision as to whether a conflict exists rests with the member.

5. Confirmation of Minutes

Minutes of the Extraordinary Council Meeting held Thursday 21 May 2020.
(Previously circulated)

Item 6

REPORT TO: **COUNCIL**

MEETING DATE: **TUESDAY 9 JUNE 2020**

FROM: **GROUP MANAGER CORPORATE**
BRUCE ALLAN

SUBJECT: **HORSE OF THE YEAR 2020 SHAREHOLDERS REPORT**

1.0 PURPOSE AND SUMMARY - *TE KAUPAPA ME TE WHAKARĀPOPOTOTANGA*

1.1 The purpose of the report is to present to Council the 2020 Horse of the Year Shareholder Report which is attached as **Attachment 1**. The Chair of Horse of the Year (Hawkes Bay) Ltd (HOYHB) Mr Tim Aitken will be present at the meeting to present this report and answer questions.

1.2 Also attached as **Attachment 2** is a covering letter from Mr Aitken which notes the review that has been undertaken and the decision of the Board to cancel the contract with the event management company SMC. **Attachment 3** in the public excluded section of the agenda is a report prepared by Mr Waterhouse for the HOYHB Board.

1.3 Note, the purpose of this report and presentation is to receive the 2020 event report and acknowledge the change in event management. This report is not the avenue to discuss future funding requirements from Council - that is the purpose of the Annual Plan which will be discussed on June 25th.

2.0 RECOMMENDATIONS - *NGĀ TŪTOHUNGA*

A) **That the Council receives the report titled Horse of the Year 2020 Shareholders Report**

Attachments:

1⇩	HOY Shareholders Report 2020	EXT-10-20-20-97
2⇩	HOY Letter to HDC 21 April 2020	EXT-10-20-20-98
3	External Relationships - Trusts, Boards & Authorities - Horse of the Year - HOY Support comments to HDC April 2020 *Confidential in accordance with Section 7 (2) (b) (ii) of the Local Government Official Information and Meetings Act 1987*	EXT-10-20-20-99

LAND ROVER HORSE OF THE YEAR

2020 SHAREHOLDER REPORT

LAND ROVER HORSE OF THE YEAR

The March 2020 Land Rover Horse of the Year was the 5th under SMC Events' management.

Pleasingly, the feedback from sponsors, supporters and the community is that it was 'the best 'HOY ever'.

The event saw the highest number of trade sales , most media coverage, highest sponsorship revenue, largest live streaming views and most significant profit.... All whilst being delivered in an unusual environment of COVID 19.

HOY 2020 was the last major events in New Zealand before the national lockdown due.

This report contains an overview for the HOY shareholders which includes:

1. Sponsorship report
2. Ticketing analysis
3. Survey overview
4. Notes from staff on the following areas:
    1. Operations
    2. Equestrian
    3. Trade
    4. Friday Night
    5. Marketing & PR
    6. Trust Funding
5. Financial analysis

Item 6

Attachment 1

Item 6

Attachment 1

SPONSOR REPORT

LAND ROVER HORSE OF THE YEAR

The 10th- 15th of March saw the Land Rover Horse of the Year delivered in an unusual environment being one of the last major events in New Zealand before the national lockdown due to COVID 19.

The event has been touted as the best LRHOY ever, with stats up almost cross the board. The event saw the biggest trade ever, most media coverage, national significance in commercial partners and highest live streaming views.

The 2020 line up also included a superstar line up of Olympians and future Olympians vying at their chance to compete at Tokyo. This included Blyth Tait, Jock Paget, Clarke Johnstone and Maddy Crowe competing in the Land Rover eventing and show jumping classes.

Unfortunately, COVID 19 still had its impact, and gate numbers that were tracking significantly up pre event, started to fall away as announcements were made in NZ media about a possible lockdown and large gatherings postponed. In total, the event saw 45,558 spectators, 1709 horses and 1331 riders.

This report contains an overview of the 2020 Land Rover Horse of the Year show with reference to feedback, participant statistics, marketing and media.

Sponsor Comments

"Seeing the best Equestrian talent from around NZ across multiple disciplines and classes at this annual event is incredible.

Arguably the biggest of it's kind in the world, it creates a special environment and its well worth a visit.....especially when you also get to see our elite talent here competing in preparation for a European summer or Olympics/Commonwealth Games.!"
– Steven Kenchington, Land Rover

"Thank you to Anna, Lauren and the organising team at HOY including all of the volunteers for a fantastic show."
- Helen Walker, Stirrups Equestrian

"We thank the whole team very much for all of your hard work and commitment to making yet another HOY so special"
- Alyssa Wade, Wade Equine Coaches

Participant Comments:

"I cant believe the change in culture around the show, increased respect of riders to volunteers, officials, security - Some very positive changes"
- Katherine Corich, Show Jumping Parent

"The show just gets better and better! Thank you and everyone for all you do it's a great show to be involved in.
- Debbie Barke, Dressage Competitor

"Competing at Land Rover Horse of the Year is always a highlight, the cross country is beautifully presented and it offers the opportunity to test your horse in an atmosphere comparable to international events."
– Amanda Pottinger, Eventing Competitor

"LRHOY is always our favourite show of the season. Competing against the best horses and riders in the country, with also the best course designers and event organisation always makes for a fantastic show every year. We are already looking forward to 2021"
- Stephanie Joustra, Show Hunter Competitor

competitor and it somehow gets better every year. It all runs like clock work but with a relaxed and friendly feel. Particularly the cross country course is a major highlight for riders and spectators, this gives New Zealand an insight to the highest standard and atmosphere available on the world stage. This is an equestrian festival and New Zealand is lucky to be the hosting nation. Hats off to the organisers for the excellent work they are doing with HOY it's an amazing show!"
- Jock Paget, Olympian and Competitor

"The show always has a high level of professionalism from the moment the entries are open. We know each year we can rely on all the event crew and volunteers to run a show we always enjoy and look forward to.
- Jono Smith, Show Jumping Competitor

"Land Rover Horse of the Year 2020 was a show that buzzed and exceeded expectations. The calibre of events put on, the facilities for competitors and spectator exhibits made it the best LRHOY I have attended yet. I always highly recommend LR HOY, and will continue to do so!"
- Elise Power, Eventing Competitor

LAND ROVER HORSE OF THE YEAR

Industry Comments

"Thank you for your email and thank you, more importantly for an exceptionally well run event last week. As first timers to the HOTY show, we were thrilled with the results across our 3 trade sites and the response from the spectators was extremely positive.

We managed to achieve above $ in sales over the 6 days, which exceeded our expectations and provided positive affirmation that launching our brands in the NZ market was the right decision."
- Pet Stock / Establo

Another great Show, BIG well done to you and your amazing Team, you guys ROCK, How lucky were we all to sneak this wonderful show in. we had a great show, trade was good , and we would definitely like to book in for next year
- Forbes and Co

Thanks for another great Horse of The Year Event.
I appreciate how much work and effort goes into arranging such an event,
- **CBJ Saddlery**

"Was a great show for us; our best so far (gets better every year!)"
- Animal Therapeutics

"This was one of the smoothest and best feeling HOY's I've been around for a while. Great job! "
- ***Marilyn Thompson***


ROVER LOUNGE
LAND ROVER
LAND ROVER
LAND ROVER

Spectator Comments

"Such a fun place, loads of awesome shops and it is so amazing to watch all the riders!!"
- Halaina Lazarides

"AMAZING ! Best grounds with great competition and tons of awesome shops. Great food and fun environment."
- Sophie Curtis

"Great spectacle and well organised!"
- Nigel Castles

" Amazing show this year, probably the best one ever!"
– Pip McCarroll

"Great show for all things horses!"
- John McWilliams

So much to see and do, it's so well organised!"
- Joe Brownfield

"It was a fantastic experience. The whole event felt warm, inclusive, safe and family friendly. We will be back!"
- Survey respondent

"How lucky is Hastings to host such an international event of calibre, what a well produced event!"
– Kerre McIvor

Statistics captured via entry data and post event surveys

45,558
Attended
(2019: 53,157)

1,709
Horses competed

1,331
Riders competed

42,080
Visitor nights
(Survey 2018)

$5.28 Million
Contribution to regional
GDP (Survey 2018)

86%
Of visitors come from outside
of the region

GENDER

Male – 6%

Female – 94%

43%

Have an income of

$100,000 +

52%

Spent $500 +

Onsite

LOCATION

Auckland – 19%

South Island – 16%

Hawkes Bay – 14%

Waikato – 16%

Wellington – Wairarapa – 11%

Manawatu – Wanganui - 9%

Bay of Plenty – 7%

Northland – 2%

Gisborne – 2%

Taranaki – 3%

AGE

55+ - 13%

45-54 – 25%

35-44 – 14%

25--34 – 14%

18-24 - 12%

0 -18 – 19%

Item 6

Attachment 1

97%

Likely to return in 2020

113,949

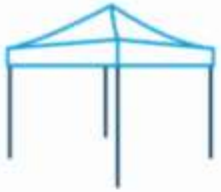
People organically reached on a single Instagram Post

96%

Good to excellent event rating by competitors and spectators

68%

Of attendees listed 'shopping' as one of their main reasons to attend



SOLD OUT

Retail Village
(over 220 sites)

92%

Purchased from trade & sponsor sites

SKY SPORT NEXT

Live Stream Tuesday - Sunday

100%

Of attendees surveyed were able to recall one or more sponsors

76,919

Website views in March 2020

25,076

Hours viewed of live streaming

61,615 Unique Views

Via Live Streaming

Item 6

Attachment 1

LAND ROVER HORSE OF THE YEAR

ECOYA Women of Inspiration

A brand new event for 2020 saw an opportunity to celebrate some of the incredible women in the Equestrian Industry and other areas who have achieved phenomenal things in their field.

A stable of trailblazing New Zealand heroines were invited to the 2020 Land Rover Horse of the Year on Thursday night, supported by fragrance house ECOYA.

The 2020 panel included popular New Zealand media personality, successful author, health and wellness warrior and new Mum, Matilda Green, the first female Chairwoman to 'smash the glass ceiling' in Super Rugby, Chiefs Chair Tonia Cawood, global-trotting entrepreneur and businesswomen, Katherine Corich and CatWalk Spinal Cord Injury Research Trust founder and Horse of the Year Hall of Famer, Catriona Williams.
Comedienne, television personality and author Jaquie Brown rounded out the line-up.

Emcee for the evening, Newstalk ZB's Kerre McIvor had the audience in fits of laughter regaling tales of her own career's twists and turns and personal growth along with the fact she's "a horse girl without a horse" and being at Land Rover Horse of the Year is the closest she's ever going to get.

The event sold out at 150 attendees, and the VIP guest list included: Lisa Coupe, Blyth Tait, Jock Paget, Clarke and Jean Johnstone, Amanda Pottinger, Maddy Crowe, Sonia Mason, Kate Plaw, Briar Burnett-Grant, Sarah Giltrap, Stephen Kenchington, Kirsten Wise (Napier Mayor), Tania Kerr (Hastings Deputy Mayor), Alyssa Wade, Pip McCarroll, Helen Walker, Kimberly Bird, Jane Lovell-Smith, amongst others.

Item 6

Attachment 1

"The energy and vibrancy of this event is fabulous. The ECOYA Women of Inspiration event was just magical and the panel was very entertaining. I'd love to see that back again next year."
- Jane Lobb

"I think the success of the occasion was absolutely founded on the concept - the planning and your collective magic in pulling it all together - congrats!
The turn out and engagement proves that men and women love to be inspired and connected"
- Tonia Cawood

"That was a remarkable evening ladies!! Well done on getting that fabulous panel. Gosh Kerre was hilarious"
- Jean Johnstone

"I've been thinking about that ECOYA evening and the HOY show a lot. It's quite surreal to think we did what we did and literally 1 week later we were in self isolation. The brilliance of Kerry Woodham, it's true "I want to be just like her when I grow up!" 😊. And the wise words of Katherine Corich, so much honesty from Maltida which shows how beautiful she is on the inside as well as out and the lovely Tonia Cawood who I admire enormously. We are truly surrounded by some wonderful women and that goes for you along with your team as well as the ECOYA team. It went incredibly well"
- Catriona Williams

"Ecoya was a fabulous evening - I am glad I came down for it. Next year, same thing, different panel? "
- Pip McCarroll

"Thanks so much Lauren, I wasn't sure what us men were in for but it was a fantastic evening! Thoroughly enjoyed it"
- Jock Paget

"That was sensational! What a fantastic evening. We definitely would like to be involved next year"
- Stephen Kenchington

LAND ROVER HORSE OF THE YEAR

Media

- NZ Herald
- Hawkes Bay Today
- Focus Magazine
- Newstalk ZB
- The Hits


Hawke's Bay Horse of the Year: 'Women of Inspiration' coming


Horse power meets girl power

Video Content

A number of basic videos from 'equestrian celebrities and influencers were shared on the Facebook and Instagram channels to drive engagement and awareness of this event.

A total of 7 videos were shared on Facebook and this included videos from Blyth Tait, Kerre McIvor, Matilda Green, Helaan Tompkins, Pip McCarroll and Jonelle Price. These videos had a combined **12,000 views.**

Item 6

Attachment 1

Blyth Tait Retirement

Land Rover Horse of the Year was firmly thrust into the global media spotlight, with the world exclusive announcement that Olympic legend Blyth Tait was calling time on his eventing career. Without question, this produced some of the biggest media exposure the show has ever generated.

An arrangement with TVNZ secured the primetime 7:20AM live interview and announcement with Blyth on the network's Breakfast show. Inevitably this news quickly went viral around the world, with UK publications 'Horse and Hound', 'British Eventing', 'Eventing Nation' and Badminton along with Australia's 'An Eventful Life' picking up the story.

The consummate professional, Blyth proved a potent marketing force for Land Rover Horse of the Year 2020 and the entire team felt honoured he decided to make his announcement from the show.

A celebration of Blyth's glittering career was unveiled before the show's Friday Night Fiesta with a poignant big screen ;look-back' at the Olympian's highlights, capped off with a standing ovation from a packed grandstand and adoring fans.

A full range of media covering this huge event included:

- TV1 news and sport
- TV3 news and sport
- Radio New Zealand
- NZ Herald
- Equestrian Sport New Zealand
- Horsetalk
- Stuff
- NZ Regional papers
- Otago Daily Times
- Horse and Pony Magazine
- Show Circuit Magazine
- FEI International
- An Eventful Life
- Badminton Horse Trials
- Eventing Nation
- Horse and Hound
- British Eventing

Olympic equestrian star Blyth Tait announced his retirement this morning at Land Rover Horse of the Year in Hastings where he is competing.

"The likelihood of me competing again overseas is unlikely, I'm very happy to hand over the reins to the younger ones coming through and I support them fully. There is a bright future and still some serious young talent out there," the 58 year-old said.

Tait had an interest in horses from a young age. By 1992 he held the No 1. world ranking, a position he retained for a decade.

Blyth Tait Announces Retirement from Eventing

While competing at the Land Rover Horse of the Year Show in Hastings, New Zealand this week, eventing legend and four-time Olympian Blyth Tait announced his retirement from the sport at the age of 58.

Blyth Tait reflects of illustrious equestrian career as he announces retirement

Land Rover Burghley Day

Following a visit from Land Rover Burghley Horse Trials Event Director Elizabeth Inman in 2018, the relationship with one of the most prestigious events in the world and the Land Rover Horse of the Year has continued to grow.

Following the launch in 2019, the Land Rover Burghley is a highlight of the week for riders and spectators.

The 'Discovery Gardens' was once again transformed into a 'Baby Burghley' complete with iconic replica Land Rover Burghley jumps, a public bar, delicious food, a VIP Hospitality area and well-known Burghley features such as 'winners avenue.'

This area provided the best seats in the house to catch all of the Land Rover Cross Country action right up close and saw the area packed with guests.

To round off the authentic Land Rover Burghley feeling, the competitors were treated to the Burghley Technical Official Phillip Surl officiating the event, and past Burghley competitors Clarke Johnstone and Jock Paget competing in the competitive field of riders

Item 6

Attachment 1

Item 6

Attachment 1

LAND ROVER HORSE OF THE YEAR

Olympic Cup

Waipukurau's Brooke Edgecombe is celebrating the biggest win of her equestrian career after claiming Land Rover Horse of the Year's most revered trophy, the prestigious Olympic Cup.

In what was the pinnacle event of the Land Rover Horse of the Year show, the Waipukurau show jumper aboard mare LT Holst Andrea jumped double clear into what would be a nail biting two horse jump off.

As the combination took to the ring for the third and final time, the pair had a couple of lives as the poles rolled back and forth in their cups, the packed out grandstand so quiet you could hear a pin drop.

As she flew the last clear the crowd erupted and it was then up to Hastings local Melody Matheson riding Cortaflex Graffiti MH to apply the pressure.

But it wasn't Matheson's day, with heartbreak as the oxer in front of the grandstand came down and the winner was declared.

Amongst incredible company, the combination outshone in more ways than one, and they now have the infamous Stirrups Equestrian red jacket and rug to prove it.

Brooke dedicated her win to the support system around her, specifically renowned coach Jeff McVean, and Vicki Wilson's equine therapy sessions throughout the week.

Hastings Heart of Hawkes Bay Friday Night Fiesta

A crowd favourite, the Hastings Heart of Hawkes Bay Friday Night Fiesta is the ultimate family night targeted at the local Hawkes Bay community.

Hosted by local emcee, Wags, the night included a range of entertaining acts and kicked off the evening with the parade of the Resene Schools Art Competition banners. These banners were proudly paraded by local primary school children who had creatively painted them during the school term.

The Popular Pony Six Bar Challenge saw gutsy pony and rider combinations take on six jumps in a row in a 'knock out' style competition with each round increasing the jumps in height.

It came down to two talented pony and rider combinations from the original starters, with the final winner being determined following one pony faulting at the final obstacle.

The Streets Jump and Drive Carriage competition saw a horse and rider jump a loop of small fences before jumping on the back of a carriage and take on a speed course around the arena.

Goat of the Year had the audience in stiches of laughter as some of New Zealand's top riders had to navigate goats around an obstacle course.

Harrison Lane Retailer Awards

The Harrison Lane Retailer Awards returned for the third year and are gaining momentum each year.

Retailers at the show were up for four different prizes which included;

- Best Interactive Site
- Best Designed Site
- Best Food Vendor
- The People's Choice Award (voted on Social Media)

The awards were attended by over 100 retailers at the show, and guests were served beverages and canapes offering a chance to mingle before the awards started.

- The Most Interactive Award went to Better Living
- The winner of the Best Designed Site went to Hot Spring Spas
- The best Food Vendor was Piku

The final winner was announced on Sunday of the show following over 200 votes on social media and went to Uber Snug.

The Harrison Lane Retailer Awards are growing in popularity and the standards are getting higher each year as each trade site aims to take home a top prize.

Bayleys Business Lunch

Always a popular event, the Bayleys Business Lunch hosted on Friday in the VIP Lounge, saw the area packed with corporate tables.

Over 100 local business leaders and corporates headed to the Land Rover Horse of the Year for an opportunity to network while soaking up all the action of the show.

Visitors were invited into the Premier Arena to walk the course, led by an expert and had the best seats in the house to catch all of the best up and coming riders battle it out for the Bayleys Young Rider of the Year title.

Visitors then mixed and mingled over lunch while taking in the show.

This was a sell out event met with lots of praise from the business community.

Marketing and PR

Media coverage for Land Rover Horse of the Year 2020 was extensive, from a TV One world exclusive with Blyth Tait to bulletin leading sports stories on mainstream news networks, interview led radio programming and a plethora of stories across newspaper, social media and digital platforms.

Coverage leading into the event featured: the show's retail village selling out in record time and full capacity, Tokyo eventing contenders vying for Olympic selection, ECOYA's 'Women of Inspiration' Evening and Hawke's Bay schools' avid participation in the Resene School Art Competition.

Land Rover Horse of the Year 2020 exceeded all expectations of media coverage. The considered approach to announcing Blyth's internationally worthy eventing retirement paid dividends, with a primetime slot on Breakfast and extended coverage throughout the day.

At a time of such global focus amid the spread of COVID-19, this was a considerable achievement.

The support of filming from The Crowd Goes Wild created a fresh feel-good factor to the event, and along with boosted coverage from Hawke's Bay Today and the industry's equestrian websites and publications highlighted Land Rover Horse of the Year 2020 as one to remember.

Item 6

Attachment 1

Print

This year's marketing campaign headlined with imagery of eventing icons, Blyth Tait and Jock Paget. This complimented the 'super star line up' tagline that rolled out across a number of platforms.

Three feature advertisements were pushed this year with official media partner NZME through Hawke's Bay Today newspaper and the New Zealand Herald.

A combination of messages were shared through the print platform and included a promotion of the Hastings Heart of Hawkes Bay Friday Night Fiesta, a drive for early ticket sales with 'tickets on sale now' and the 'super star line up' messaging.

The adverts were circulated with prime positioning and increasing regularity in the Hawke's Bay Today and community papers over the weeks leading into the event.

Community papers included Hastings Leader, Napier Courier, Hawkes Bay Mail and Bush Telegraph.

- 15 Print Adverts placed across Hawkes Bay from December to March

To increase engagement from local youngsters the annual Resene colouring competition was again included in three newspapers in February, offering locals the chance to win a Resene prize pack and a family pass to the show.

Radio

2020's radio campaign ran from the 22nd of February right through to the 14th of March over a number of stations on the NZME network.

Stations included, The Hits, Newstalk ZB, Coast and ZM

Kerre Kclvor from Newstalk ZB broadcast from NZME's Napier studios during the week of the event alongside emceeing The ECOYA Women of Inspiration evening. She mentioned the Land Rover Horse of the Year multiple times on her show in the lead up to and following the event.

The ad schedule featured radio ads promoting different elements of the show, including the Land Rover Cross Country, The ECOYA Women of Inspiration, The Hastings Heart of Hawkes Bay Friday Night Fiesta and a general promotion of the event.

Coverage included:

- Over **336 30 second ads** played across NZME Networks
- Included **93 x The Hits, 75 x ZB, 72 x The Coast & 96 x ZM**
- Included **multiple** adlibs and ticket giveaways
- **Multiple** pre event interviews on ZB Network

Alongside this, Central FM pushed its own rural audience campaign with 110 additional ads, ad-libs, on-air interviews and ticket giveaways


LAND ROVER

Digital

A growing platform of marketing of Land Rover Horse of the Year is the digital space.

The digital marketing campaign launched January 28th through both New Zealand Herald and Hawkes Bay Today offering 35,000 & 50,000 impressions. This ran for five days in January, then was followed up with another six days of coverage on both channels from the 24th of February.

To reinforce the event's digital presence, a Sponsored Story (paid branded content) was placed on the NZ Herald Website featuring the media story on the eventers launching their Olympic Campaign at the show.

The Google Display Network Campaign ran for three weeks starting on the 2nd of February across a number of sites.

Electronic Direct Marketing

Regular EDM's were sent out to an expansive database of 10,000+ subscribers. The database comprises of competitors, spectators and those who have been added via the website.

These included rider-specific EDM's. Content encompassed general show updates, schedules, sponsor messaging and promotions, ticket and other relevant information. EDM's were sent fortnightly from November onwards with weekly EDMs in the month pre-event and daily updates throughout the show week.

Open rate averaged over 30% which is above industry average

Website

The Land Rover Horse of the Year website is updated regularly with key information and updates. It is a key point of access for people to find information regarding the show.

The link to tickets, information about the different classes/events, schedules, link to class entries, parking information and all other relevant information needs to be easily accessible

- **76, 919 Webpage views in March 2020**
- **70.5% were new users**

Item 6

Attachment 1

Outdoor

In 2020, a different approach was taken to the outdoor advertising and the campaign was focused on more prominent sites with larger collateral.

Highway signage increased from five to seven locations in Hastings, a total of ten sites in Napier and two new sites in Havelock North.

Three larger billboards were installed – one placed at Napier Airport and two were placed on Havelock Road between Hastings and Havelock North and moved to center field during a prominent race day at the Hawkes Bay Race Course.

Street flags promoting the event were installed from one month pre event in both Napier and Hastings in key locations.

Alongside billboards, there was a large display in the Napier Airport baggage claim, along with a digital billboard to accompany it.

All of these elements tie together to promote the event over the whole of the Hawkes Bay Region.

Social Media

Social Media continues to be one of the key marketing tools for the Land Rover Horse of the Year. This is a platform that is constantly evolving and changing and works as a popular tool to connect with the current and new audiences.

The platform is used to share information, show updates, engage with customers, promote event elements and drive ticket sales.

The 2020 Facebook Campaign was primarily based around sharing content to drive engagement, promote key features of the event and share social media exclusive ticket offers and promotions.

Facebook Ads

Facebook ads were used as a way to connect new audiences and target specific messaging to specific groups.

A range of Facebook ads were delivered in the lead up, promoting different elements of the show including the night show, Land Rover Burghley Day and generic event promotion. A range of key words were used to target a large audience with equestrian interests or connections.

All of the Facebook ads had a strong call to action, clicking directly through to ticketing pages and or more information.

Video Content

Video content proves to be a way to engage with the Facebook Audience as Facebook prioritises video content in the social feed.

Five key videos were launched in the lead up to the 2020 event, acting as highlight reels from previous events with a key theme in each video. The video themes included, competition, winners, hospitality, cross country and the show experience.

These videos resulted in **21,000 views**.

Following the announcement of the ECOYA Women of Inspiration event, a number of basic videos from 'equestrian celebrities and influencers' were shared on the Facebook and Instagram channels to drive engagement and awareness of this event.

A total of 7 videos were shared on Facebook and this included videos from Blyth Tait, Kerre McIvor, Matilda Green and Jonelle Price. These videos had a combined **12,000 views.**

Other content
A number of generic posts were shared on Facebook in the lead up to the event sharing event updates, countdowns, sponsor posts, ticket giveaways and promotion of ticket offers.

There was a minimum of five posts a week for the final months, with daily content in the last few weeks ahead of the show.

The engagement on these posts were increasingly high at the event got closer with an organic reach on a post growing to over **62,000**

HIGHLIGHTS:

- **22,000** Facebook Followers
- Average Engagement over **1,000**
- Organic Reach over **62,000** on a single day
- Organic reach on a single post over **45,000**
- Average reach on posts over **11,000**
- **559** new page likes over last month

Instagram

Instagram is a channel that is extremely popular with the up and coming riders at Land Rover Horse of the Year and offers an opportunity as a new community to target and engage with.

There was an increase in followers by **2,145** throughout this years Instagram campaign with much more potential to grow this medium. There are a total of **7645** followers on the Land Rover Horse of the Year Instagram page.

The Instagram campaign received over **11,000** 'likes' on a single post and included a reach of **113,979.**

Instagram targets a younger audience with 67% of Instagram followers on the Land Rover Horse of the Year Instagram page being under 24 years old.

This is an effective tool to share mostly imagery with shorter captions showcasing different elements of the event and one that should be a key focus to further enhance. '

For the first time, official Land Rover Horse of the 'GIPHY's" were created to be used as stickers on Instagram. Fans were able to add these to their own images.

Influencer Campaign

Following the inception in 2019, the Instagram Influencer campaign was continued in the lead up to the 2020 event.

A range of riders were approached to come on board, with the objective to target riders with influence and significant followings to promote the event to.

The riders were:

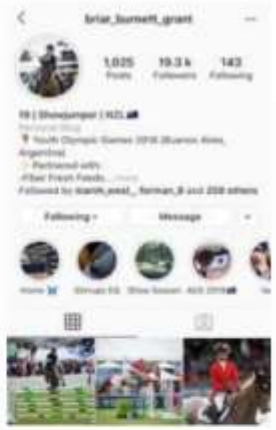
Briar Burnett-Grant – **19,300**
Emma Watson – **12,900**
Olivia Dalton – **19,300**
Molly Buist-Brown – **22,,600**
Savanna Stirling – **1,339**
Eloise Stevenson – **8,994**

The combined following of these riders is **84,433**

These 'content creators' were required to post on their own channels promoting the event, and were invited to post on our page using the Instagram 'story' feature.

They were given the official Instagram account for a day, to share an insight into their day to day riding lives in the lead up to the event which was a highlight for users. This content proved invaluable with over 300 new followers gained during these 'take overs'.

This is a concept to be further developed and promoted going forward.



Community Engagement:

Resene "Horses in Hawkes Bay" Schools Art Competition
Resene partnered with Land Rover Horse of the Year to create an initiative in 2017 involving primary schools in the local area.

The participating schools receive all the materials needed to paint a banner based on their interpretation of the show.

These banners were on display in Show Jumping Arena One all week and were paraded in the Premier Arena during the Hastings Heart of Hawkes Bay Friday Night Fiesta.

Schools are given free children's entry to attend the show at any time during the week, and are offered a free school visit and guided tour of the event.

Residents 2 for 1 offer
The Two for One Residents Offer returned in 2020, offering the chance for local residents to receive a two for the price of one entry to the show. Residents needed to enter a code to redeem their tickets. This was promoted via a maildrop included in the rate notices for 16,500 Napier residents, in the local newspaper, My Hastings, and through Hastings District Council channels.

This further reinforced the positive relationship between locals and the show, helping to drive attendance and engagement.

Pony Club Competition
This is an annual online competition run over Facebook to engage with the Pony Clubs located throughout New Zealand.

This year Pony Club's were invited to create a video that showcased their pony club spirit to go in the draw to win a tickets to attend the event for their club and a course walk with a top rider for a Premier Arena jumping class.

This is a key promotional tool to include the up and coming generation of riders in the event, and offer them the opportunity to be inspired.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Live Streaming

The event was live streamed throughout the week directly to the new Sky Sport Next platform. This saw the live stream being fed directly to the Sky Sport Next Youtube Channel.

Live streaming the event, offered the opportunity for people from anywhere in the world to catch the action, for free. The footage stays on the Youtube channel so can also be played back and re-watched at any point.

All Premier Arena classes from Tuesday to Sunday were live streamed including the Land Rover Cross Country from multiple camera views on the Saturday. This meant the viewers could see majority of the cross country course throughout the whole showgrounds

This had a massive uptake with over 87,000 people tuning in over the week to catch all the action. This broadens the reach of the show significantly with viewers tuning in from all over the world.

- **25,076** hours of live streaming viewed
- **61,615** unique views
- **87,843** total live views
- **17:08** minutes average view time
- Total overall views **87,869**
- Views from NZ, United States, Australia, United Kingdom and Canada

PR

Media coverage for Land Rover Horse of the Year 2020 was extensive, from a TV One world exclusive with Blyth Tait to bulletin leading sports stories on mainstream news networks, interview led radio programming and a plethora of stories across newspaper, social media and digital platforms.

Coverage for the 2020 Land Rover Horse of the Year included;

- TV1 News & Sport x2
- TV1 Breakfast (live cross)
- TV3 News & Sport
- Radio New Zealand
- Crowd Goes Wild x3
- Newstalk ZB x3 live interviews
- Radio Sport
- NZ Herald x8
- Hawkes Bay Today x7
- Equestrian Media (Horse and Pony, Show Circuit, ESNZ etc)

The event's official launch and press conference once again garnered the attention of TV1 and TV3 sport, The Crowd Goes Wild, and Radio Sport/NZ Herald.

Guests were invited to attend the star-studded launch at Auckland's Jaguar Land Rover Archibald and Shorter premises, where decorated Olympian Blyth Tait, Jock Paget, Clarke Johnstone and Maddy Crowe announced their competition intentions for the show.

Media angles focussed around hopeful Tokyo selection for Clarke and Maddy, along with Blyth's decision to return to compete.

Feature Stories:

The week's competition kicked off with comprehensive daily press releases from the day's main events, sent to over three hundred news, sports and equestrian news outlets. As a result, coverage across the targeted channels was exponential.

A story on the featured in the **NZ Herald** on the show's Volunteer Army Swinging into Action resonated well with readers and Horse of the Year enthusiasts and served to highlight the event's reliance on its 500+ volunteers who keep the wheels of the show turning.

Another feel-good local story featured a group of Flaxmere primary school children given their first guided tour of the event.

TVNZ's Hawke's Bay reporter Sean Hogan filmed and ran a family story on Amanda Pottinger's bid for Tokyo selection and hopes of following in her mother, (Olympic bronze medalist) Tinks Pottinger's footsteps.

TVNZ Breakfast also went live to share Blyth Tait's retirement announcement. This was a first for Land Rover Horse of the Year, and was the first to announce his retirement. The media following this in New Zealand and Europe was huge!

Crowd Goes Wild ran x3 stories and x1 live cross during their two days of filming at the show.

A light-hearted look at what it takes to compete at Olympic selection level, featuring Maddy Crowe and Olympic judge Christina Klingspor in a carpool karaoke to ABBA and an acting cameo from Blyth, a remarkable story of 'comeback kid' Pro Am leader Paxton Conder and rounded off with the colour and characters from the Mounted Games. Blyth Tait also featured in a live cross announcing his eventing retirement

Item 6

Attachment 1

Land Rover Horse of the Year Media Coverage

http://www.gisborneherald.co.nz/local-sport/20200319/30789/

https://www.tvnz.co.nz/one-news/sport/other/hawkes-bays-horse-year-chance-olympic-equestrian-hopefuls-impress

http://www.voxy.co.nz/sport/5/360425

https://www.nzherald.co.nz/the-country/news/article.cfm?c_id=16&objectid=12317069

https://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=12315503

https://www.nzherald.co.nz/northern-advocate/news/article.cfm?c_id=1503450&objectid=12317069

https://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=12315169

https://www.scoop.co.nz/stories/CU2003/S00114/land-rover-horse-of-the-year-young-rider-title-a-first-for-briar-burnett-grant.htm

https://www.nzherald.co.nz/nz-horse-of-the-year/news/article.cfm?c_id=1504839&objectid=12312288

https://www.nzherald.co.nz/hawkes-bay-today/news/article.cfm?c_id=1503462&objectid=12316230

https://www.scoop.co.nz/stories/CU2003/S00120/southerner-picks-up-premier-stakes-win-at-land-rover-horse-of-the-year.htm

https://www.scoop.co.nz/stories/CU2003/S00121/tokyo-hopefuls-take-their-hat-off-to-bundy-in-the-land-rover-horse-of-the-year-four-star.htm

https://www.nzherald.co.nz/hawkes-bay-today/news/article.cfm?c_id=1503462&objectid=12313552

Land Rover Horse of the Year Media Coverage Continued..

https://www.nzherald.co.nz/hawkes-bay-today/news/article.cfm?c_id=1503462&objectid=12314534

http://www.voxy.co.nz/sport/5/360368

https://www.nzherald.co.nz/the-country/news/article.cfm?c_id=16&objectid=12315724

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https://www.scoop.co.nz/stories/CU2003/S00103/mums-the-word-for-newly-crowned-lady-rider-of-the-year-at-land-rover-horse-of-the-year.htm

https://www.nzherald.co.nz/business/news/article.cfm?c_id=3&objectid=12290985

http://www.voxy.co.nz/sport/5/360008

http://www.voxy.co.nz/sport/5/360001

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https://www.horsetalk.co.nz/2020/03/17/kiwi-showjumping-pioneers-charisma-honoured/

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Land Rover Horse of the Year Media Coverage Continued..

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https://www.rnz.co.nz/news/sport/411542/four-time-olympian-blyth-tait-retires-from-equestrian

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https://www.horsetalk.co.nz/2020/03/13/blyth-tait-retirement-eventing/

https://www.tvnz.co.nz/one-news/sport/other/equestrian-legend-blyth-tait-calls-time-distinguished-eventing-career

https://www.nzherald.co.nz/northern-advocate/sport/news/article.cfm?c_id=1503448&objectid=12316118

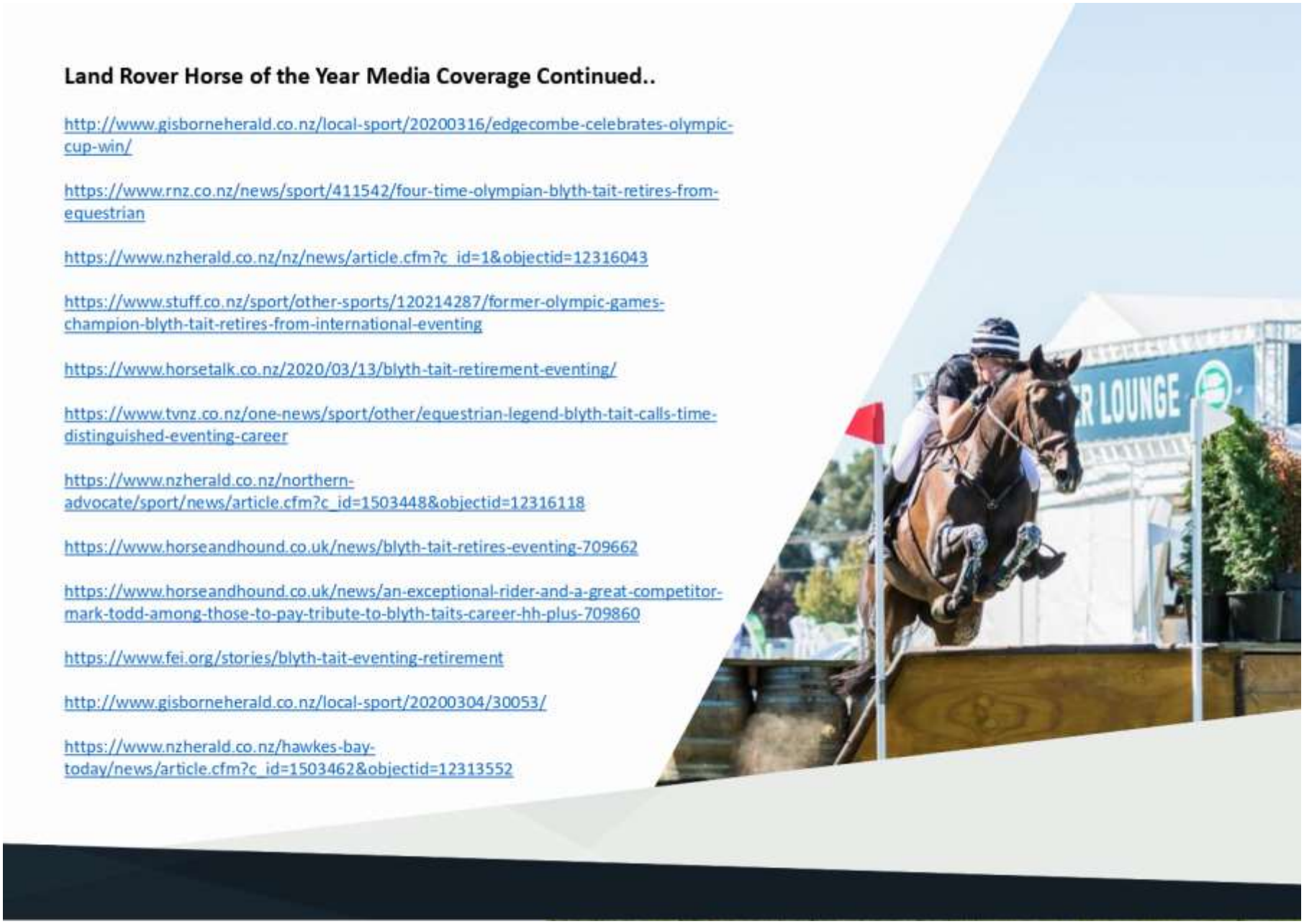
https://www.horseandhound.co.uk/news/blyth-tait-retires-eventing-709662

https://www.horseandhound.co.uk/news/an-exceptional-rider-and-a-great-competitor-mark-todd-among-those-to-pay-tribute-to-blyth-taits-career-hh-plus-709860

https://www.fei.org/stories/blyth-tait-eventing-retirement

http://www.gisborneherald.co.nz/local-sport/20200304/30053/

https://www.nzherald.co.nz/hawkes-bay-today/news/article.cfm?c_id=1503462&objectid=12313552



Land Rover Horse of the Year Media Coverage Continued..

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https://www.main-events.com/event/723/nz-equestrian-news/news/view/4072/double-whammy-for-takapaus-samantha-carrington

https://www.main-events.com/event/723/nz-equestrian-news/news/view/4073/brooke-edges-out-hb-rival-to-claim-2020-olympic-cup

https://www.main-events.com/event/723/nz-equestrian-news/news/view/4065/southerner-picks-up-premier-stakes-win-at-hoy-show

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https://www.main-events.com/event/723/nz-equestrian-news/news/view/4067/tokyo-hopefuls-take-their-hat-off-to-bundy-in-hoy-f

https://www.main-events.com/event/723/nz-equestrian-news/news/view/4068/olympians-inducted-into-equestrian-hall-of-fame

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https://www.main-events.com/event/723/nz-equestrian-news/news/view/4058/jesse-linton-makes-the-5yo-class-look-easy

https://www.main-events.com/event/723/nz-equestrian-news/news/view/4059/shake-up-in-the-land-rover-hoy-4-star-eventing

https://www.main-events.com/event/723/nz-equestrian-news/news/view/4061/nerves-of-steele-a-winning-formula-in-silver-fern-s

https://www.main-events.com/event/723/nz-equestrian-news/news/view/4055/sensational-start-for-clarke-eyeing-a-berth-for-tok

https://www.nzequestrian.org.nz/2020/03/tokyo-hopefuls-take-their-hat-off-to-bundy-in-the-land-rover-horse-of-the-year-4/

Item 6

Attachment 1

Major Title Winners

Norwood Gold Cup – Lisa Coupe & Lotte

Premier Stakes – Grace Percy & Kiwi Spirit

Farmlands Pony of the Year – Samantha Carrington & Colours of Lansing

Ultra Mox Lady Rider of the Year – Rachel Malcolm & Monte Carlo MVNZ

Bayleys Real Estate Young Rider of the Year – Briar Burnett – Grant & Fiber Fresh Delphine NZPH

Cavallino Silver Fern Stakes – Robert Steele & LT Holst Bernadette

Junior Rider – Samantha Carrington & Double J Breeze On

Stirrups NZ Horse of the Year Olympic Cup – Brooke Edgecombe & LT Holst Andrea

Harrison Lane Pro Amateur Rider of the Year – Larina Dolman & Kiwi Lansing

Wade Equine Coaches Amateur Rider of the Year – Kaleigh Kent & Double J Sponge Bob Square Pants

Horse Show Hunter of the Year – Abby Robinson & Hillman Hunter

Land Rover CCI4*-S – Bundy Philpott & Tresca NZPH

Land Rover CCI3*-S – Donna Edwards-Smith & DSE Cluny

Grand Prix Horse of the Year– Melissa Galloway & Windermere Jobei W

TICKET SALES ANALYSIS

TOTAL HOY 2020 SHOW ATTENDANCE

Spectator Tickets	Paid	Days	Comp	Days attended
Tuesday/ Wednesday	498	1	55	554
Grab One	16	2		32
Any Day	2645	1	1246	3892
HB Resident	402			402
Multi pass - 2	1275	2	86	2722
Multi pass - 3	863	3	93	2868
Multi pass - 6	206	6	107	1878
			Total	12348
Spectator Camping				
6 Day I Ticket	48	6		288
			Total	288
Functions (Tickets that include GA)				
HOFG	48	1	48	96
X Country Lunch	35	1	32	67
Fish and Chips Friday	24	1	19	43
Bayleys Lunch	6	1	128	134
Burghley Day	30	1	30	60
ECOYA	68	1	63	131
			Total	531
OTHER				
Volunteers / Officials		6	449	2694
Competitor / Support Wristbands		6	3624	21744
Additional wristbands (Media, Shareholders)		6	285	1710
Trade Sites -		6	897	5382
Sponsors (included in comp tickets)				
General Staff (incl security etc)		6	55	330
			Total	32391
			5310	
TOTAL				45558

SURVEY OVERVIEW

Survey Overview:

- Total of 775 respondents
- 52% spent $500+ onsite
- 86% came from outside of the region
- 92% purchased from trade sites
- 68% of attendees listed shopping as one of their main reasons to attend
- 81% attended to watch show jumping
- 95% would recommend to a friend
  - 92% in 2019
- 96% Good – Excellent Rating by both competitors and spectators
  - 95% in 2019 & 61% in 2015
- 45% of spectators said that the current economic climate would affect their decision to attend
- 66% of competitors said that the current economic climate would affect their decision to attend
- 66% of competitors were aware of the Health and Safety reporting line

Friday Night Manager Overview – Sophie

As you can imagine I was not happy with how this panned out which I take full responsibility for. With 2 acts cancelling the day before the show the result was putting it plainly 'Boring'.

It is of my opinion that Friday Night has had its day. The lighting issues and size of the arena make it difficult to give any real atmosphere. Having to try and please an audience in three locations makes if difficult when only 1 audience can see the large screen. Even if we put a large budget on it, the surface and timeframe for set up would still make it difficult to deliver.

As mentioned in Equestrian, Will and I have been talking about options and I have a great idea to replace Friday night that would not only see officials / volunteers being appreciated but it would also give us a theme to introduce a Friday Night Participants Gathering. Will go into this in more detail later on in the year.

Item 6

Attachment 1

SPONSORSHIP NOTES

Sponsorship Manager Overview – Anna

- $682,969 total confirmed sponsorship for the 2020 show
- A total of $54,837.82 sold in February / March
- Sponsors currently out of contract following the show are:
  - Hastings District Council
  - Napier City
  - Land Rover
  - Resene
  - ECOYA
  - Cavallino
  - Agrekko
  - Farmlands
  - IRT
  - New World
  - McPhersons
  - Pernod Ricard
  - Streets
  - Hot Spring Spas
  - Mainfreight
  - 4CYTE
  - Bayer
  - Be Pure
  - Eighthirty
  - NZME
  - Stirrups

Company	Cash	Contra
4CYTE		$ 3,000.00
Ariat	$ 4,261.09	
Aggreko		$ 30,000.00
Bayer NZ Limited	$ 14,500.00	
Bayleys	$ 4,900.00	
BePure	$ 2,000.00	
Dr Feel Good	$ 3,000.00	
Ecoya	$ 20,000.00	
Eighthirty	$ 5,000.00	
Farmlands (McMillan, NRM)	$ 2,200.00	$ 6,600.00
Harrison Lane	$ 7,245.00	
Hawkes Bay Contracting		$ 13,190.00
Hawkes Bay Today		$ 10,000.00
Hawkes Bay Trim and Canvas		$ 2,500.00
HDC	$ 150,000.00	
HirePool		$ 20,000.00
Hot Spring Spas	$ 13,430.00	
IRT	$ 15,000.00	
Land Rover	$ 95,000.00	
Land Rover Additionals	$ 21,285.00	
Lion Co (Hopt Etc)	$ 40,000.00	
Mainfreight		$ 10,000.00
McPhersons	$ 5,500.00	
Mills Honda (Motorbikes)		$ 2,700.00
Napier City	$ 30,000.00	
New World	$ 10,000.00	
Nga Tawa	$ 2,000.00	
NZME Radio		$ 8,000.00
Pernod Ricard	$ 8,500.00	
Resene	$ 18,000.00	
Sky Sport	$ 50,000.00	
Stirrups	$ 6,078.26	
Stirrups / Cavalino		$ 12,000.00
Streets	$ 12,000.00	
T N Electrical	$ 2,500.00	
Wade Equestrian	$ 6,288.00	
Small Sponsors / Patrons	$ 16,291.73	
TOTAL	$ 564,979.08	$ 117,990.00
GRAND TOTAL		$ 682,969.08

Item 6

TRUST FUNDING NOTES

Attachment 1

Trust Funding Manager Overview – Anna

Overview:

- NZCT Confirmed $40,000
- Pub Charity Confirmed $10,000
- NZ Transitional Agency (NZRB) Confirmed $30,000
- Infinity Foundation Confirmed $10,000
- Four Winds Confirmed $30,000
- Total of $120,000 confirmed for 2020

Declined applications from:

- Youth Town
- Trillian Trust
- Pub Charity (second application)
- Pelorus Trust
- North and South Trust
- Lion Foundation
- Grass Roots Trust
- First Light Foundation

FUNDER	OUTCOME 2019	DESCRIPTION OF USE 2020	REQUESTED 2020	OUTCOME 2020
ECCT	$2,000.00	Volunteers	TBC	NOT AVAILABLE
First Light Foundation	Declined	Schools Promo Coordinator	$5,000	DECLINED
Four Winds	$30,000.00	Venue Hire	$30,000	$30,000 CONFIRMED
Grassroots	Declined	Repair of polo fields	$12,000	DECLINED
Infinity Foundation	$5,000 $10,000	Venue Hire	$30,000	$10,000 CONFIRMED
Lion Foundation	$5,000.00	Donation for Group	$20,000	DECLINED
NSTL	Declined	Medics	$5,000	DECLINED
NZ Racing Board	$10,000.00 $8,000.00	Continental Event Hire SJHB	$30,000	$30,000 CONFIRMED
NZCT	$40,000.00	Security	$40,000	$40,000 CONFIRMED
Pelorus	Declined	Security	$10,000	DECLINED
Pub Charity	$15,000.00	Fencing	$30,000	$10,000 CONFIRMED
Trillian Trust	Declined	Medic Services	$10,000	DECLINED
Youth Town	N/A	Volunteer Groups	$30,000	DECLINED

Item 6

Attachment 1

MARKETING NOTES

Marketing Manager Overview – Anna

Highlights of 2020 Marketing Campaign:

- Pre-event ticket sales ahead of 2017, 2018 and 2019 at start of show
- Pre-event ticket offers ahead of 2019 stats (unfortunately this wasn't able to flow through due to Covid 19)
- Increased gateway signage locations in Hastings, Napier and Havelock North
- Large billboards sites installed in high profile areas
- Organic reach of over 62,000 in a single day on Facebook
- 559 new page likes on Facebook in March
- Over 11,000 likes on a single post on Instagram
- Huge engagement from influencers

Key areas of concerns from survey respondents:

- Friday Night Show
- Shavings process – Lots of suggestions to pre-order online
- Warm up rings need improving
  - Show Jumping surface warm ups full of stones / uneven ground
  - Grass warm ups need same watering as competition rings pre-event
- Office staff unfriendly
- More toilets in Purple area
- Day parking difficult
- Games too close to show hunter – causes major issues in Show Hunter ring
- State of yards – Many needed repairs, had old poo in them, broken in places

Item 6

Attachment 1

21th April 2020

Dear Mayor Hazlehurst and Councillors

Attached is our report to Shareholders for the 2020 Horse of the Year (HOY) event. We also include a report prepared by Craig Waterhouse identifying the benefits of significantly changing the management of the event and to essentially "bring in house" the HOY management

The board of Horse of the Year Limited (HOYL) is delighted to announce a surplus from the 2020 event (final figures are still being reviewed) With Covid-19 being a potential threat, we were extremely lucky to be able to hold the event and it did not become a hot spot for a Covid 19 outbreak

The dates for Horse of Year 2021 are set for 9th to 14th March. The board is working on the principle that we will hold the same size event as the successful 2020 event, but we are considering a number of different scenarios should Covid 19 still be an issue.

39 000 who attended the event were visitors from out of Hawkes Bay, majority needing to have accommodation, food, drink and animal supplies purchased near-by. Anecdotally some local restaurants and accommodation providers were booked out, others were noticeably extremely busy.

The post-event evaluation of the 2018 HOY event recognised a $4.5 million economic benefit from visitors to Hastings and Hawke's Bay. This figure does not include the benefit to the A&P Tomoana Show Grounds from the rental that HOY pays. This $100,000 investment enables the A&P to continue to operate and to reinvest into the grounds and facilities which then benefits other events such as the Hawkes Bay Farmers Market, A&P Show, Primary Sector Awards, Horticultural field-days and many others. There is increased income for Hastings retail outlets, including groceries, horse supplies, veterinarians, Farmlands, Restaurants, wineries, accommodation (both commercial and private), service stations etc, as well as employment benefits for locals who provide parking, security, logistics, and media services.

Recently HOYL had an extensive review of the management/delivery structure. This review was completed last year by Onfield Solutions. The board are now using this report as a starting point for 2 major changes. Initially to request an extension of our hosting contract for a further 8 years and secondly to cancel the current management contract with SMC.

Currently HOYL has a contract with Equestrian Sports New Zealand to host the event till 2027, and the board is now seeking to extend that contract to 2035.

Also as a result of this review, previous shareholder concerns and current discussions, the HOYL board has cancelled the current contract with SMC and are now working on options that will

give HOYL more opportunity to reinvest into the event, and bring even more revenue and services to Hastings and Hawke's Bay. We sincerely wish this event be identified as a HASTINGS event which we acknowledge has been difficult to achieve under the past management contract (signed over 5 years ago)

The Board's current planning looks out to 2035 and the board continues to ask itself- "What does the gold standard event look like for 2035?"

We know better facilities are essential, and we are seeking to work with the A&P Society and HDC to develop an appropriate asset plan for the grounds, so that we are not just hosting the biggest multi discipline equestrian event in Australasia/the southern hemisphere but the best, with world class facilities that we can all be proud of.

Our vision for HOY is to be a Hastings-centric event, to enhance the reputation of Hastings as a location, and to ensure we retain our position as Australasia's premiere multi-discipline horse show for riders, spectators, and the entire community. To achieve this vision and ensure a smooth transition to Hastings centric management, continued support from Hastings District Council is critical. We feel that HOY is and should be Hastings 'number 1 event, rivalling all other major events in New Zealand, and this can only be achieved by a committed Council with confidence in its investment. We therefore seek support from Council on a two-year basis with an annual investment of $190,000.

These funds will be used to fund HOYL (not the management company, as in the past) thus ensuring any profit remains here. Should the HOY 2021 be another successful and profitable show, the board will adjust accordingly its future requirement for funding.

Regards

Tim Aitken Chair Horse of Year (HB)limited

REPORT TO: **COUNCIL**

MEETING DATE: **TUESDAY 9 JUNE 2020**

FROM: **GROUP MANAGER CORPORATE**
BRUCE ALLAN

SUBJECT: **URBAN CENTRES' RECOVERY FUND**

1.0 EXECUTIVE SUMMARY - *TE KAUPAPA ME TE WHAKARĀPOPOTOTANGA*

1.1 The purpose of this report is to establish a COVID-19 Recovery Fund for the Hastings District Urban Centres of Hastings, Havelock North and Flaxmere to be administered by the Hastings City Business Association (HCBA), the Havelock North Business Association (HNBA) and the Flaxmere Business Association (FBA), in consultation with their members.

1.2 This decision contributes to the purpose of local government by primarily promoting the economic wellbeing and more specifically through the Council's strategic objective of supporting and attracting business and building a resilient and job-rich local economy***.***

1.3 The preferred option is for Council to:

- Create a $150,000 Hastings District Urban Centre Recovery Fund to be administered by the respective business associations of Hastings City, Havelock North and Flaxmere in consultation with their members.

1.4 The Business Associations will make applications from the Recovery Fund and will need to demonstrate wide support of their members for the recovery plan and the utilisation of the Urban Centre recovery funds.

2.0 RECOMMENDATIONS - *NGĀ TŪTOHUNGA*

A) **That the Council receives the report titled Urban Centres' Recovery Fund**.

B) **That the Council approves the allocation of $150,000 from the 2020/21 COVID Recovery Contingency budget to a Hastings District Urban Centres' Recovery Fund with the urban centres being the Hastings CBD, Havelock North and Flaxmere urban centres.**

C) **That the allocation of the funds will be subject to the respective Business Associations preparing Recovery Plans for implementation and demonstrating support of their members.**

D) **That an Urban Centres' Recovery Fund Approval Board be established comprising Councillors Schollum, Harvey, Dixon and Lawson along with Council's Group Manager Corporate and Group Manager Strategy and Development.**

E) **That the Urban Centres' Recovery Fund Approval Board be delegated authority to develop a terms of reference and approve the release of funds as required.**

3.0 BACKGROUND – *TE HOROPAKI*

3.1 Council collects targeted rates called the Hastings City Marketing Rate and the Havelock North Promotion Rate to the value of $289,000 and $52,000 respectively.

3.2 According to Council's Rate Statement, the rates are for the purposes as follows:

- Hastings City Marketing Rate – "the marketing programme aimed at the promotion and revitalisation of the central business area of Hastings".
- Havelock North Promotion Rate – "the marketing and promotion of the central Havelock North commercial area".

3.3 There is no targeted rate collected to support the marketing and promotion of the Flaxmere Urban Centre.

3.4 The level of funding available from the targeted rate is sufficient for the Business Associations to conduct Business as Usual activities. However, it is not sufficient to allow the HCBA or HNBA to do more in response to the impact on their CBD economies from the COVID-19 lockdown.

4.0 DISCUSSION - *TE MATAPAKITANGA*

4.1 On May 7th 2020, Council adopted an interim Hastings District Council Recovery Plan which incorporated an Economic Recovery Programme of Regenerate and Revive. In that programme under the heading of "Strong Urban Centres", there are actions that, within the Hastings CBD, Council will continue to collaborate with business associations to activate and stimulate our urban centres. For the Havelock North Urban Centre, Council acknowledges that it will consider bespoke actions that contribute to the recovery.

4.2 The action for the Flaxmere Urban Centre was to facilitate private and public sector capital investment into the Flaxmere CBD.

4.3 The creation of an Urban Centres' Recovery Fund, available for the Hastings, Havelock North and Flaxmere urban centres, sits well with the Council's Recovery Plan and acknowledges that the CBDs have potentially been badly affected by this pandemic and the lockdown response.

4.4 The Business Associations are well placed to connect in with their members and deliver on an action plan that supports their respective recovery plans. They are the appropriate organisations to support the CBDs and therefore deliver on the Recovery Funds that are to be established.

<u>The Proposal</u>

4.5 The proposal is to create a Hastings District Urban Centres' Recovery Fund for the respective Business Associations to draw from to fund their recovery plans. The Business Associations are currently working up their recovery plans in conjunction with input from their members.

4.6 The Business Associations will present their proposals to an Urban Centres' Recovery Fund Approval Board at Council and will need to demonstrate that

they have the support of their members and that their members have participated in the development of the recovery plan.

4.7 The Approval Board will include Councillors Harvey and Schollum in their roles as Council advisors to the Business Associations, Councillor Dixon (Chair of Civic and Administration) and Councillor Lawson (Chair of Great Communities) along with the Group Manager Corporate and Group Manager Strategy and Development.

4.8 All proposals will include a marketing plan and budget as well as a financial request to Council. At the time of writing, a draft Hastings CBD Marketing Plan for the CBD Recovery had been received.

4.9 It is expected that the Business Associations will report back to Council on actions taken and KPIs met.

Funding

4.10 Depending on when the funds are required to be drawn down, there are two options and both require accessing the Contingency Reserve.

4.11 If funding is required this financial year (2019/20), the Contingency Reserve has a balance of circa $500,000 which is sufficient to fund this request.

4.12 If funding is not required until next financial year (2020/21), the draft budget includes a Covid response contingency budget of $1,000,000 which will be available to be utilised for this purpose. At the time of writing, there are no other known calls on this reserve.

4.13 The Contingency Reserve is going to be integral in allowing Council to respond to currently unknown and unquantified opportunities and issues that will require funding. Already Council is incurring additional costs with its response to meeting the requirements of the Covid response and this will continue as we understand more about what is required to keep the staff and our community safe.

4.14 The following is a summary of the Contingency Funding available for the next year:

	2019/20	2020/21
July 2019 opening balance	$560,000	
Less forecast 2019/20 allocations	($100,000)	$460,000
Covid Operations Contingency		$500,000
Covid Response and Recovery Contingency		$1,000,000
Available Funding		$1,960,000

Note: If the Covid Response and Recovery Contingency is not utilised or required for this purpose, it will be used to repay debt as previously signalled.

5.0 OPTIONS - *NGĀ KŌWHIRINGA*

Option One - Recommended Option - *Te Kōwhiringa Tuatahi – Te Kōwhiringa Tūtohunga*

5.1 Create an Urban Centres' Recovery Fund for Hastings, Havelock North and Flaxmere, with applications to be made by the Hastings City Business Association, the Havelock North Business Association and the Flaxmere Business Association.

Advantages

- It has been identified in the Council Recovery Plan that support may be required to promote and stimulate our urban centres. The effects of the Covid-19 enforced lockdown has been hugely detrimental to the businesses in our city centres and some additional support is required.
- The Business Associations are well placed to implement their bespoke recovery plans for their CBDs and some additional funding will help significantly deliver on achieving that additional promotion.

Disadvantages

- The true impacts of the Covid-19 pandemic and the economic lockdown are currently unknown and the commitments required on the contingency budgets for 2020/21 may be significant. However, the allocation of $150,000 at this early stage of the recovery process is well timed to help our Urban Centres' communities recover and prosper once again.

Option Two – Status Quo - *Te Kōwhiringa Tuarua – Te Āhuatanga o nāianei*

5.2 Alternative options could be explored that have a reduced amount of funds allocated to our Urban Centre recoveries or the allocation of those funds could be delayed to get a better understanding of the true needs. These alternative options are not supported and an early and well planned response is seen as the best option at this time.

6.0 NEXT STEPS - *TE ANGA WHAKAMUA*

6.1 The next steps are as follows:

- Hastings City Business Association, Havelock North Business Association and Flaxmere Business Association are to prepare recovery plans and plans for the delivery of outcomes associated with this funding.
- Establish the Hastings Urban Centres' Recovery Fund Approval Board with terms of reference and delegated authority to distribute the approved funds.
- Support the Business Associations with any communication plans to ensure the members of these business associations and the wider public are aware of these recovery programmes.

Attachments:
There are no attachments for this report.

SUMMARY OF CONSIDERATIONS - *HE WHAKARĀPOPOTO WHAIWHAKAARO*
Fit with purpose of Local Government - *E noho hāngai pū ai ki te Rangatōpū-ā-rohe* The Council is required to give effect to the purpose of local government as set out in section 10 of the Local Government Act 2002. That purpose is to enable democratic local decision making and action by (and on behalf of) communities, and to promote the social, economic, environmental, and cultural wellbeing of communities in the present and for the future.
Link to the Council's Community Outcomes - *E noho hāngai pū ai ki te rautaki matua* This decision contributes to the purpose of local government by primarily promoting the economic wellbeing and more specifically through the Council's strategic objective of supporting and attracting business and building a resilient and job-rich local economy.
Māori Impact Statement - *Te Tauākī Kaupapa Māori* There are no known impacts for Tangata Whenua.
Sustainability - *Te Toitūtanga* This proposal supports the ongoing economic sustainability of the Hastings, Havelock North and Flaxmere Urban Centres.
Financial considerations - *Ngā Whaiwhakaaro Ahumoni* The funding identified for this proposal is to be funded from the Contingency Reserve.
Significance and Engagement - *Te Hiranga me te Tūhonotanga* This report has been assessed under the Council's Significance and Engagement Policy as being of low significance in terms of the value to be appropriate for this purpose.

Consultation – internal and/or external - Whakawhiti Whakaaro-ā-roto, ā-waho Consultation has occurred with the Hastings City and Havelock North Business Associations who are supportive of this proposal.
Risks: Legal/ Health and Safety - *Ngā Tūraru: Ngā Ture / Hauora me te Haumaru* There are no known risks associated with this proposal other than the risk that the business associations will use the funds for activities not agreed upon. However, that risk is seen as very low.
Rural Community Board - *Ngā Poari-ā-hapori* There are no implications for the Rural Community Board to consider.

REPORT TO: **COUNCIL**

MEETING DATE: **TUESDAY 9 JUNE 2020**

FROM: **3 WATERS MANAGER**
BRETT CHAPMAN

SUBJECT: **LOWES PIT - OPTIONS FOR STORMWATER REMEDIATION**

1.0 EXECUTIVE SUMMARY - *TE KAUPAPA ME TE WHAKARĀPOPOTOTANGA*

1.1 The purpose of this report is to update the Council on the results of investigations undertaken in and around Lowes Pit and to present two options for stormwater remediation.

1.2 This report follows on from the report presented to Council on 10 December 2019 “A Strategy for Managing Stormwater and Minimising Risk” which set out an approach to implementing stormwater controls for discharges into Lowes Pit to protect the receiving environment and minimise risks to groundwater.

1.3 The December report addressed concerns about the potential for contaminants from stormwater to enter into groundwater. An independent risk assessment from Tonkin & Taylor determined that the risk to groundwater from Lowes Pit was very low with a very low contamination risk to the HDC bore field at Frimley.

1.4 The approved strategy incorporates a management regime targeting contamination at source in combination with stormwater treatment as a multi-barrier approach.

1.5 This report presents results of the detailed investigations undertaken in February and March of this year to identify stormwater contaminants discharged into Lowes Pit, evaluate the risk that these contaminants pose, and to develop options for mitigating these risks to appropriate levels.

1.6 Funding of $2.0M has been proposed in the 2020-21 Annual Plan which is contingent on Council confirming their preferred approach from the options presented in this report.

1.7 Two options are proposed. **Option 1** includes the conversion of a portion of Lowes Pit into a vertical flow wetland as part of the treatment process with filling in of the rest of the area whereby **Option 2** applies solutions in the upstream network and at the end-of-pipe discharges into Lowes Pit.

1.8 Both options address the impacts of stormwater using source control measures and treatment devices with the fundamental difference being the proposed conversion of approximately 25% of Lowes Pit into a wetland as part of the treatment process with the remainder being filled in.

1.9 This conversion would remove the existing water body which sits in an industrial landscape and is no longer appropriate to our current and future stormwater initiatives. It provides an opportunity to greatly improve the

appearance and utility of the surrounding area whilst providing enhancements for the community and improving ecological and cultural stormwater outcomes.

1.10 Leaving Lowes Pit as it currently exists does not reduce the ability to manage and treat stormwater but necessitates a different approach to achieve the same outcome so that water quality is not compromised.

1.11 The costs and timeframes for each option vary but could be implemented in stages if this was desired. The recommended approach is to continue with source control measures to high and medium risk properties in combination with the installation of treatment devices (depending on the preferred option) and lastly to implement changes to Lowes Pit if Council adopted Option 1.

1.12 This decision contributes to the purpose of local government by primarily promoting social and environmental outcomes and more specifically through the Council's strategic objectives to minimise the impacts of urban stormwater on the receiving environment.

2.0 RECOMMENDATIONS - *NGĀ TŪTOHUNGA*

A) **That the Council receives the report titled Lowes Pit - Options for Stormwater Remediation**

B) **That the Council approves Option 1 as set out in the report - Stormwater mitigation including source controls, gross pollutant traps and conversion of Lowes Pit as the preferred treatment strategy**

3.0 BACKGROUND – *TE HOROPAKI*

3.1 The previous report "A Strategy for Managing Stormwater and Minimising Risk" dated 10 December 2019, sets out the background of Lowes Pit and the stormwater catchment that discharges into it.

3.2 Concerns about the interaction between the pit water quality, the unconfined ground water aquifer beneath (in particular the potential for bacteriological contamination from stormwater into Lowes Pit) and potential risks to the Hastings drinking water supply, were investigated and addressed.

3.3 Tonkin & Taylor who are Council's key advisors on source protection and drinking water risks concluded that the risk to the Hastings drinking water supply from Lowes Pit was very low.

- *'This assessment has indicated that the Frimley borefield is not threatened by the E coli levels measured in the Lowes Pit to date. Overall, the pit is viewed as a very low contamination risk to the Frimley borefield.'*

3.4 As part of the agreed approach, detailed investigations were undertaken in February and March of this year to provide a suite of information to enable options to be finalised, targeted at preventing or removing contaminants from the stormwater discharge.

3.5 This report therefore focusses on quantifying the extent of stormwater contamination in the Lowes Pit catchment, assessing the risks to the receiving environment and providing options for mitigation to enable decisions to be adopted for the 2020-21 Annual Plan.

4.0 DISCUSSION - *TE MATAPAKITANGA*

4.1 A detailed programme of investigations was undertaken in February and March within the stormwater network that discharges into Lowes Pit. These investigations included visual inspections, sampling during dry and wet weather conditions and analysis of contaminants within the stormwater.

4.2 Surveys were completed to confirm the physical parameters of Lowes Pit, area, depth etc. and water quality was sampled and analysed across different depth profiles. In addition, sediment samples were taken from the floor of the pit and analysed for a suite of heavy metals, pesticides and hydrocarbons.

4.3 The basis for these investigations was to confirm what is happening in the stormwater catchment, identify contaminants and their sources and evaluate any risks and mitigation options where required.

4.4 The results and conclusions from these investigations are summarised as follows:

- There is no evidence of human waste in dry weather samples taken within the stormwater network.
- E.coli bacteria was detected in both dry weather and wet weather conditions at levels that are consistent with other urban stormwater systems.

- DNA analysis shows that sources of bacteria are predominantly ruminant animals (sheep and cows).
- Heavy metals and nutrients were detected in dry and wet weather flows with significant peaks of nutrients measured in samples collected from manholes in dry conditions. It should be noted that this water was static in the manholes with no outflow observed.
- Some elevated metals (dissolved zinc) were present and can be associated with zinc based roofing materials and brake pads.
- Pesticides were not detected but there is a presence of pyrene (a Polycyclic Aromatic Hydrocarbon or PAH) which is used to make dyes, plastics and pesticides.
- There is a noticeable volatile odour present in the drain along Hazelwood Street which is consistent with bitumen or similar sources of petroleum based products.
- Total suspended solids (TSS) are generally low compared with similar industrial catchments.

4.5 Surveying and sampling of Lowes Pit confirmed the following:

- The basin is fairly shallow ranging from less than 1.0m to 3m at its deepest point.
- The basin floor is covered in submerged weed growth with high nutrient growth.
- Floor sediment samples at two sites tested below ANZEEC 2000 low trigger values for all metals and Total PAHs.
- Sediment samples in the middle of the basin exceeded high trigger values for lead and zinc and exceeded low trigger values for arsenic, chromium, copper and nickel. The sediments in this location would be classified as contaminated soil if they were to be removed for disposal.
- Sediment results suggest that pollution has occurred in the past and is continuing likely sourced from the discharge in Hazelwood Street via street and property runoff.
- E.coli levels were detected in low concentrations (<100 cfu / 100 ml) and are considered low by NZ fresh water standards.
- Pesticide concentrations were not detected (below detection limits) however traces of arsenic, chromium, copper, lead, nickel and zinc were detected which can lead to ecological impairment.
- Plant nutrients (total nitrogen and phosphorus) are slightly elevated contributing to the accelerated weed growth observed.

4.6 **Risk Assessments**

4.7 The Lowes Pit stormwater catchment findings are generally consistent with other industrial and commercial stormwater systems that have few or no stormwater mitigation in place to control pollution.

4.8 **Water supply risks** from stormwater pollution in Lowes Pit have previously been assessed as being very low. It may be that further quantitative analysis of the risk to groundwater is conducted based on the further evidence obtained from the investigations undertaken.

4.9 An assessment of **general urban stormwater risks** has determined that the concentrations of heavy metals (dissolved and particulate), suspended solids and the presence of industrial/commercial chemicals (PAHs) can be considered as being medium to high risk.

4.10 Nitrogen and phosphorus were measured at low to medium concentrations and are typical of industrial catchments. They present a low to medium risk rating.

4.11 The assessment of **pathogen risk** (infectious viruses, protozoa, bacterium etc.) uses E.coli as a surrogate indicator of their presence or absence. E.coli was found in manholes during dry weather sampling (not flowing) and also in previous wet weather sampling at moderately elevated levels consistent with typical values found in other industrial and urban catchments.

4.12 DNA testing of samples in the piped network confirmed the source as being predominantly from sheep and cows, most likely from deposition within roadways that drain into the stormwater network.

4.13 Another observed source of E.coli comes from the extensive waterfowl population that is present in Lowes Pit. Samples collected from the surface and the bottom of the pit show levels of E.coli in line with NZ contact recreation guidelines and with the low level of human interaction and recreation at Lowes Pit the risk is considered to be low.

4.14 **Recommended Risk Mitigation Plan**

4.15 Various options have been considered to mitigate the risk of stormwater pollution sources and their potential effects. Assessment of these options and development of a recommended risk mitigation plan have carefully reviewed the levels of risks, the requirements set forth in various local/regional/national guidelines for stormwater pollution and consideration of water security management.

4.16 Options for mitigation of stormwater pollution risks range from source control measures, the use of proprietary treatment devices and end-of-pipe treatment as well as filling in Lowes Pit and converting a portion of this reclaimed area into a natural wetland treatment system.

4.17 These options provide flexibility to take a staged multi-barrier approach combining a management regime along with hard and soft engineering solutions.

4.18 **Source controls** include a suite of management, operational and policy intervention measures targeting pollution at source (primarily industrial run-off) capturing and treating it before it can enter into the stormwater system. This requires knowledge about what activities are occurring, what sorts of contaminants may be present and understanding how these contaminants could make their way into the stormwater system.

4.19 There is a growing body of evidence that zinc from rooftops and copper from brake pads contribute to stormwater pollution and there are moves to ban zinc from roofing materials to reduce their impact. HDC has implemented policies that prohibit their use in Omahu and Irongate industrial areas for any new builds. Likewise, alternative options are being explored into the use of more benign materials for use in brake pads that could see a change in future.

4.20 As part of our consent conditions work has been ongoing for several years to compile this information such that many sites in the catchment have now been categorised in terms of their risk to stormwater.

4.21 We are continuing our work with HB Regional Council on a management regime that will enable policies and controls to be implemented and then enforced so that a management regime can be successfully applied. An example of this is the introduction of stormwater management plans as part of a resource consent with an annual assessment of their performance.

4.22 Engineered treatment systems include a range of options and proprietary devices that target different parts of the stormwater network.

- **Attachment A** is the T&T report entitled “Lowes Pit Stormwater Pollution Risk Assessment and Management Options” which provides examples of the types of treatment options that could be incorporated into the stormwater network. These include:
- Rain gardens and filtration/sediment removal systems at catch pit (sump) locations to treat road runoff.
- End of pipe treatment systems to treat stormwater at the point of discharge into Lowes Pit ranging from simple and low cost to highly complex and costly, which also reflects the degree of treatment that can be achieved.
- Gross pollutant traps are an online separation system that captures solid pollutants and stores them for later extraction.
- High flow sediment filters that use cartridges or membranes to trap and contain fine particulates at high flows.
- First flush deflection utilising grinder pumps installed at the three main pipe outlets to collect and redirect dry weather flows, intermittent spills or illegal discharges plus a small amount of initial wet weather first flush. These discharges are then pumped to the wastewater system for disposal.

4.23 Filling in a portion of Lowes Pit and conversion to wetlands proposes the conversion of approximately 25% of Lowes Pit into a wetland as part of the treatment process with the remaining 75% being filled in.

4.24 This conversion would remove the existing water body which sits in an industrial landscape and is no longer appropriate to our current and future stormwater initiatives. It provides an opportunity to greatly improve the appearance and utility of the surrounding area whilst providing enhancements for the community and improving ecological and cultural stormwater outcomes.

4.25 An added benefit of creating usable land from the reclamation process is the potential to separate this off and sell the land providing a future financial return on the community's investment.

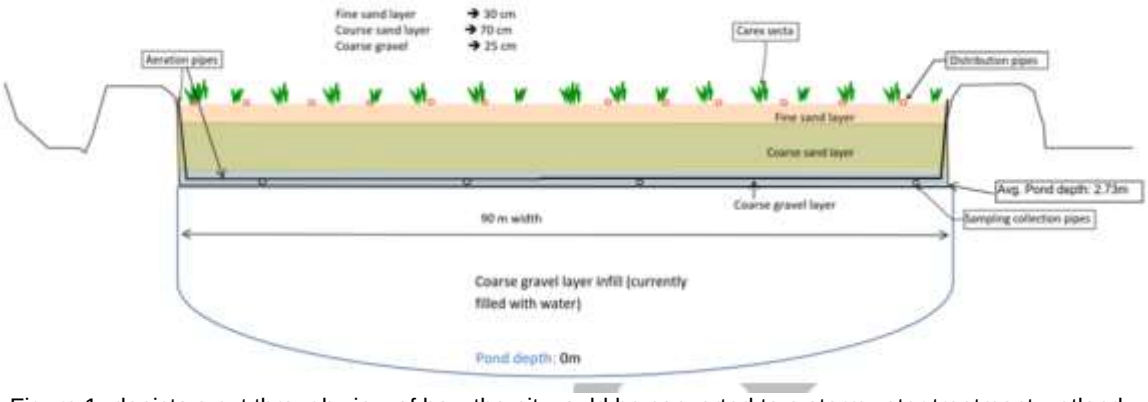

Figure 1- depicts a cut through view of how the pit would be converted to a stormwater treatment wetland.

4.26 Leaving Lowes Pit as it currently exists does not reduce the ability to manage and treat stormwater but necessitates a different approach to achieve the same outcome so that water quality is not compromised.

5.0 Option One - Recommended Option - *Te Kōwhiringa Tuatahi – Te Kōwhiringa Tūtohunga*

5.1 Stormwater mitigation including source controls, gross pollutant traps and conversion of Lowes Pit.

5.2 For this scenario, the recommended plan consists of the following options and proposed stages of implementation which represent three barriers of risk mitigation:

- Stage 1 – Implement Source Control measures as described in Section 4.18.
- Stage 2 – Construct gross pollutant trap systems on drain outlets to Lowes Pit. (E.g. Hynds First Defence High Capacity (FDHC) Vortex Separator or the Hynds Downstream Defender).
- Stage 3 – Construct vertical flow wetlands (VFW) system to include approximately 25% (to be confirmed in detail design) of Lowes Pit as discussed in Section 5.11. Fill in remainder of pit with porous material and cover depending on intended future use (e.g. Community Park).

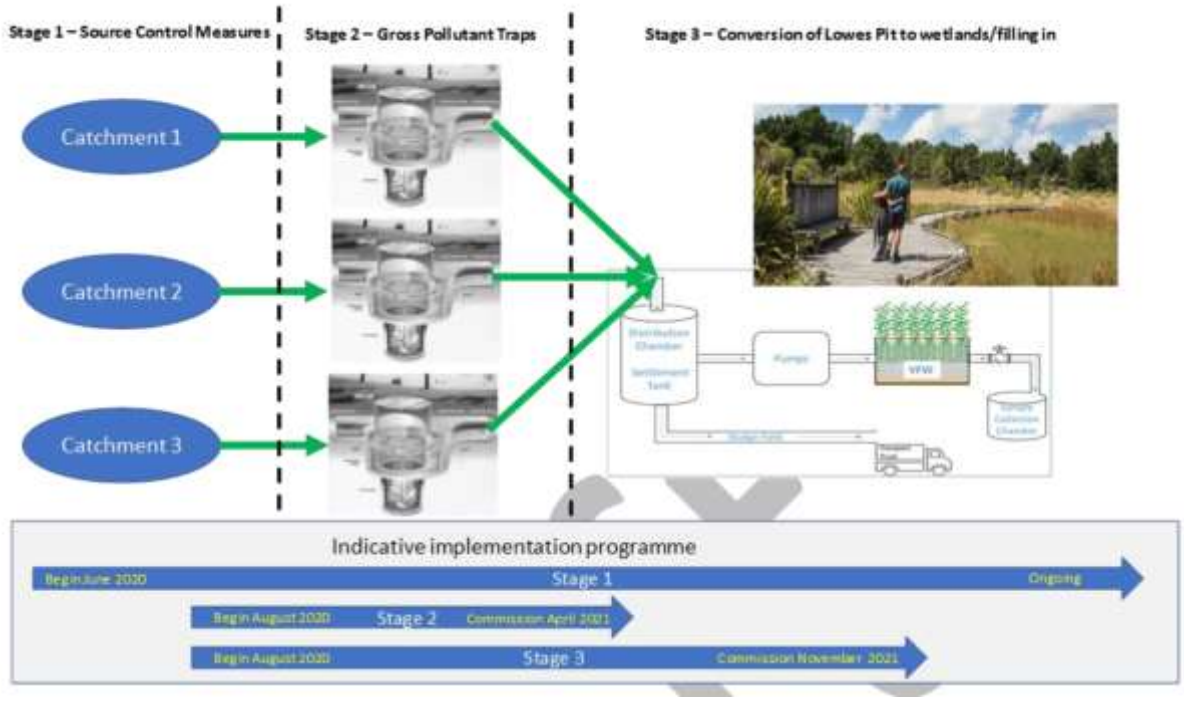

Figure 2 - Recommended options implementation plan for Option 1

5.3 As discussed, only a portion of Lowes Pit is required for conversion to a wetlands system to meet stormwater treatment management guidelines – approximately 25%. The remainder of Lowes Pit can be filled in with a cheaper aggregate material and covered to be used for other purpose (e.g. public amenity park).

5.4 The rough order base estimate for converting Lowes Pit as described above is approximately $2.9M but could be higher at $4.3M if the entire area was converted to a wetland treatment area.

5.5 The rough order cost estimate (+/- 30%) for recommended gross pollutant traps is $200K, bringing the total rough order cost estimate of Option 1 to $3.1M.

5.6 It is noted that Stage 1 costs are already part of HDC's operating budgets and potential upgrades being funded by private industry as needed (e.g. enhanced stormwater pond treatment for Catchment 4).

5.7 Timeframes for delivering the various stages are shown in Figure 2 above. While there is an indicative completion of November 2021 for the implementation of the Lowes Pit conversion, Council could build the wetland area as proposed and then defer the filling of the balance area as a staged implementation.

5.8 This would have the benefit of spreading the financial costs to complete this project over several years.

5.9 **Advantages**

- Provides an effective multi-barrier approach to stormwater treatment that meets current regulations and will align with what we expect will be the

future regulatory environment from the government's initiatives around freshwater management.

- Removes the large body of water that provides no current benefit from a stormwater or community perspective.
- Removes the concerns about pathogen risk and connectivity to the groundwater system and thus the potential to impact on drinking water quality.
- Demonstrates Council's commitment to more sustainable initiatives that incorporate low impact designs in combination with engineered treatment devices as a multi-pronged approach to stormwater management.
- Rehabilitates land that could provide community benefit through community use/aesthetics, cultural values and eco-system enhancement and the potential for a return on investment if land was to be sold

5.10 **Disadvantages**

- The primary disadvantage relates to the additional cost to rehabilitate Lowes Pit from its current status as a water body to useable land for stormwater treatment and community benefit estimated at $2.9M.
- Option 1 relies on the conversion of Lowes Pit as a critical component of the treatment train, without this conversion the stormwater treatment proposed will not meet current or future stormwater quality regulations.
- The perception by some of bacteriological risks to groundwater and hence drinking water source quality are likely to persist despite evidence to the contrary.

6.0 Option Two – Status Quo - *Te Kōwhiringa Tuarua – Te Āhuatanga o nāianei*

6.1 **Stormwater mitigation including source controls, treatment devices, end-of-pipe treatment and first flush diversion.**

6.2 For this scenario, the recommended plan consists of the following options and proposed stages of implementation which represent four barriers of risk mitigation:

- Stage 1 – implement Source Control measures as described in Section 5.5.
- Stage 2 – Construct stormwater catch pit inlet filtration systems for high traffic roadway sections and roadway section subject to large volumes of sediments/wastes from construction and agricultural vehicles.

  It is estimated that a minimum of 4 sites will require stormwater catch-pit inlet filtration systems, with each servicing approximately 2,000 m2 of roadway surface (subject to detailed design).
- Stage 3 – Construct dry weather spill/first flush deflection system as discussed in Section 4.22.

- Stage 4 – Construct end of pipe treatment systems for Catchments 1, 2 and 3 using a higher end treatment system (such as the Stormwater 360 Jellyfish).

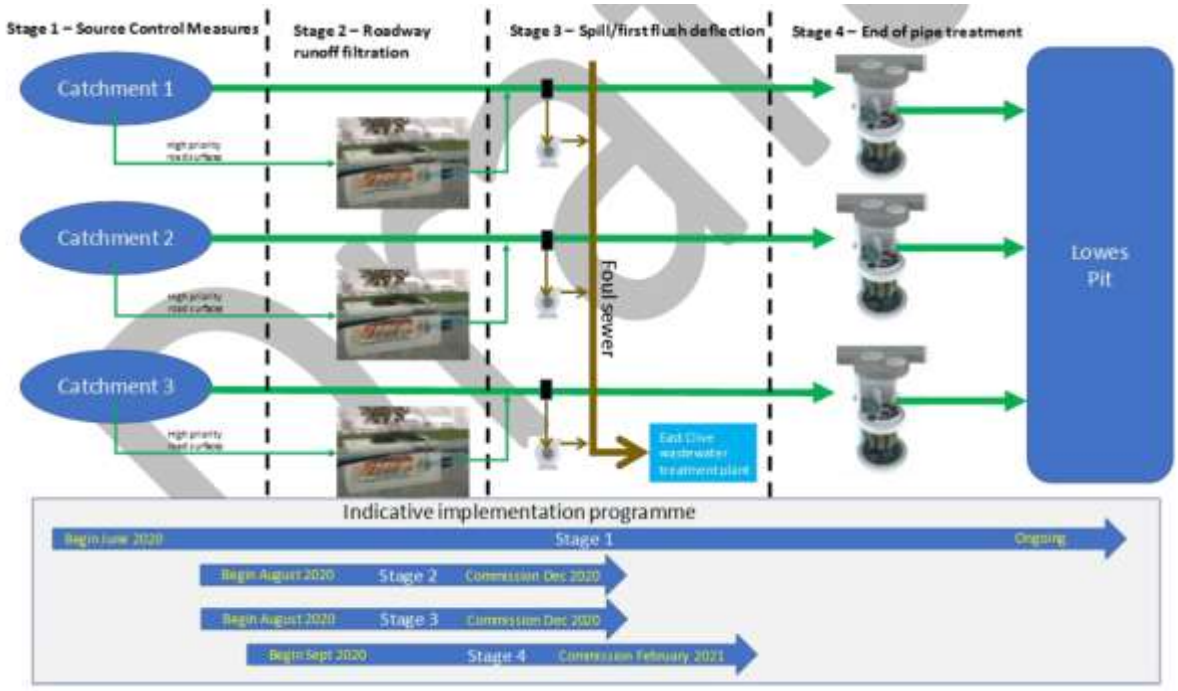

Figure 3 - Recommended options implementation plan for Option 2

6.3 This option does not require any conversion of Lowes Pit which would remain in its current form. To compensate for the loss in treatment potential provided by a wetland necessitates a range of additional treatment devices to meet the required stormwater quality outcomes.

6.4 These treatment devices will require an increased maintenance and replacement schedule to maintain their effectiveness which will need to be incorporated into our operational budgets. An annual estimate is in the region of $30,000 for the suite of devices recommended.

6.5 Stage 2 construction of stormwater catch pit inlet filtration systems is recommended as a cost effective means of reducing high volume contaminants from roadway surfaces which will help to extend the life of recommended end of pipe treatment systems and also add an additional key risk barrier.

6.6 Stage 3 construction of a dry weather spill/first flush deflection system is recommended as a lower cost/highly effective barrier for elimination of accidental/illicit spill risk and highly contaminated first flush runoff which represents a large proportion of wet weather runoff pollution loads and associated risk.

6.7 Stage 4 higher level end of pipe treatment is recommended as a last stage risk mitigation barrier prior to discharge into Lowes Pit, which would include flows that bypass the first flush barrier system.

6.8 Rough order cost estimates for Option 2 are as follows (all are subject to change as part of the detailed design and tendering stages):

- Stage 1 – cost are assumed to be part of normal HDC operating budgets and options funded by private industry as needed (e.g. enhanced stormwater pond treatment for Catchment 4).
- Stage 2 – based on the Stormwater 360 Filterra option = $50K each X 4 units = $200K.
- Stage 3 – based on the E one low pressure sewer system and duplex grinder pump = $450K.
- Stage 4 – based on the Stormwater 360 Jellyfish filtration system = $800K.

6.9 Timeframes for installation, commissioning and completion are less than Option 1 being able to be completed and operational within the first half of 2021.

6.10 Total rough order cost for Option 2 is approximately $1.5M

6.11 **Advantages**

- Provides an effective multi-barrier approach to stormwater treatment that meets current regulations and likely to align with future stormwater regulation.
- Incorporates well proven engineered treatment devices and first flush diversion as a multi-pronged approach to stormwater management.
- Implementation is relatively straight forward using proprietary devices that are common and well tested.
- Does not rely on construction of a wetland as part of the treatment solution meaning that implementation is considerably fast tracked and costs are reduced. The savings are in the order of $1.6M over Option 1.

6.12 **Disadvantages**

- The treatment devices proposed in Option 2 have limitations in capacity such that flood flows that exceed their design will bypass them and discharge into Lowes Pit untreated whereas the Lowes Pit wetland has the ability to receive and treat all flood flows.
- Lowes Pit remains in its current form. Whilst this is not significant from a stormwater perspective, the current state of the area is less than desirable and it provides no benefit to anyone.
- It is likely that HDC will have to address some of the Lowes Pit issues in regard to maintenance, adjoining neighbour encroachments and ongoing water quality management. Many of these would be remedied through the conversion to a wetland in Option 1.

- The concerns about pathogen risk and connectivity to the groundwater system and thus the potential to impact on drinking water quality will continue to be an issue for some.
- There is an increased maintenance and replacement cost associated with treatment devices. A wetland reduces the reliance on devices that could be compromised if overloaded or not maintained.

7.0 NEXT STEPS - *TE ANGA WHAKAMUA*

7.1 The preferred option is Option 1.

7.2 Officers, and the technical experts who investigated and determined the options discussed above, agree that the conversion of Lowes Pit into a stormwater wetland achieves greater benefits for Council over Option 2.

7.3 There are noted advantages from a stormwater treatment perspective and there are opportunities in regard to community enhancement from the removal of the current water body and tidying up the entire area.

7.4 The downside to adopting Option 1 is the additional cost to implement this solution however this can be offset to an extent by the additional community enhancements and value that accrues to the environment, plus the potential for future land sales to provide a return on investment.

7.5 It is recommended that Council determine the stormwater solution based on the desire to either include Lowes Pit as part of the stormwater solution in Option 1 or to progress with implementing treatment devices and exclude Lowes Pit as set out it option 2.

Attachments:

1⇩	Tonkin & Taylor report Lowes Pit Stormwater Pollution Risk Assessment and Management Options	WAT-18-06-4-20-327

SUMMARY OF CONSIDERATIONS - *HE WHAKARĀPOPOTO WHAIWHAKAARO*
Fit with purpose of Local Government - *E noho hāngai pū ai ki te Rangatōpū-ā-rohe*
The Council is required to give effect to the purpose of local government as set out in section 10 of the Local Government Act 2002. That purpose is to enable democratic local decision-making and action by (and on behalf of) communities, and to promote the social, economic, environmental, and cultural well-being of communities in the present and for the future.

This decision contributes to the purpose of local government by primarily promoting social and environmental outcomes and more specifically through the Council's strategic objectives to minimise the impacts of urban stormwater on the receiving environment.

Link to the Council's Community Outcomes - *E noho hāngai pū ai ki te rautaki matua*

This proposal promotes healthy waterways which help to prevent harm and help create a safe and healthy environment for people, promotes the best use of natural resources and supports the well-being of communities in the present and for the future.

Māori Impact Statement - *Te Tauākī Kaupapa Māori*

There are no known impacts for Tangata Whenua. This proposal aligns with freshwater initiatives that are being progressed by organisations that represent the wider Maori community and with which we are in regular dialogue about stormwater, wastewater and the protection of our drinking water sources.

Sustainability - *Te Toitūtanga*

More sustainable initiatives that improve our urban stormwater quality reduce our impact on the receiving environment and this proposal embodies the freshwater management principles of Te Mana O Te Wai and our connections with water.

Financial considerations - *Ngā Whaiwhakaaro Ahumoni*

The proposed recommendation option 1 has an estimated budget requirement of $3.1M. This is a base estimate with a low degree of accuracy of +/- 30%. The draft Annual Plan includes a budget of $2.0M for upgrades to Lowes Pit and the stormwater catchment.

Significance and Engagement - *Te Hiranga me te Tūhonotanga*

This decision has been assessed under the Council's Significance and Engagement Policy as being of low significance.

Consultation – internal and/or external - Whakawhiti Whakaaro-ā-roto, ā-waho

There has been discussion with HB Regional Council staff in regard to the stormwater issues within Lowes Pit and the wider Omahu industrial catchment. HBRC are supportive of the initiatives being proposed and will work with Council to implement a new management regime for both organisations.

Risks: Legal/ Health and Safety - *Ngā Tūraru: Ngā Ture / Hauora me te Haumaru*

Lowes Pit presents a very low risk to groundwater however there are perceptions that this body of water is a risk to the environment. It does not fit with our current or future stormwater regime and is likely to become an issue in the future despite scientific evidence that has categorised that risk. Future legislation will drive the need for upgrades so it seems sensible to implement this proposal now to future proof the stormwater system.

Rural Community Board - *Ngā Poari-ā-hapori*

No implications.

REPORT

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Document Control

Title: Lowes Pit Stormwater Pollution Risk Assessment and Management Options					
Date	**Version**	**Description**	**Prepared by:**	**Reviewed by:**	**Authorised by:**
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Distribution:

Hastings District Council	1 copy
Tonkin & Taylor Ltd (FILE)	1 copy

Table of contents

Executive summary

The following provides an overall summary of key conclusions and recommendations for management of urban stormwater pollution risks associated with Lowes Pit.

- Two key risks have been assessed for this project, and the results of this assessment have informed the development of recommended risk mitigation strategies.
  - The risk of stormwater pollution discharged into Lowes Pit effecting water quality of the Heretaunga Plains aquifer system has been assessed as being extremely low to non-existent due to the hydrogeologic conditions between the pit and the aquifer.
  - The general risk of urban stormwater pollution per existing guidelines and policies is rated as medium to high. This risk is somewhat tempered by Lowes Pit having relatively low community, cultural and ecological values.
- Sampling, inspections, and laboratory testing have confirmed the following:
  - No evidence of human sewage present in the storm drains during dry or small event wet weather conditions.
  - Detectable levels of sediments nutrients, heavy metals, bacteria and PAHs in storm drains during dry and wet weather. The levels range from low to medium based on ANZECC water quality threshold criteria.
  - DNA test for E. coli samples from wet weather events indicate that the predominant source of bacteria is from ruminant animals (e.g. cows and sheep).
  - Water samples collected in Lowes Pit at the surface and bottom during dry weather conditions show low levels of E. coli bacteria (less than 100 counts/100 ml), compliant with New Zealand fresh water primary contact recreation standards.
  - Large numbers of waterfowl are present on Lowes Pit providing a continuous source of avian pathogens to pit water.
  - Sediment samples taken from the bottom of Lowes Pit show very high levels of heavy metals (zinc, copper and lead) and detectable levels of PAHs and arsenic. This is indicative of industrial and roadway runoff pollution which is washed into storm drains when it rains.
- Recommended risk mitigation plans consisting of a multiple barrier of pollution reduction options have been developed for two scenarios as summarized below.

Scenario 1 – HDC chooses to implement an option of converting a portion of Lowes Pit into a vertical flow wetlands system and fill in the rest of the pit. While this is the most expensive option, it provides potential co-benefits of community, cultural and ecological value that should be considered as part of an overall business case. For this scenario, the following options are recommended in the order of a proposed staged/ multiple risk barrier implementation plan. Figure E1 provides a conceptual schematic of this proposed plan.

- Stage 1 – implement Source Control measures as described in Section 6.1.1.
- Stage 2 – construct gross pollutant trap systems on drain outlets for Catchments 1, 2 and 3 (e.g. Hynds First Defence High Capacity (FDHC) Vortex Separator or the Hynds Downstream Defender) as described in Section 6.1.3. Catchment 4 is served by an existing private treatment pond which should be inspected and confirmed as effective and well maintained, or replaced with a more effective treatment system.
- Stage 3 – Construct vertical flow wetlands (VFW) system to include approximately 25% (to be confirmed in detail design) of Lowes Pit as discussed in Section 6.1.5. Fill in remainder of pit

with porous material and cover depending on intended future use (e.g. community access park).

Total rough order cost for Scenario 1 options = $3.05M ex GST (see details provided in Section 6).

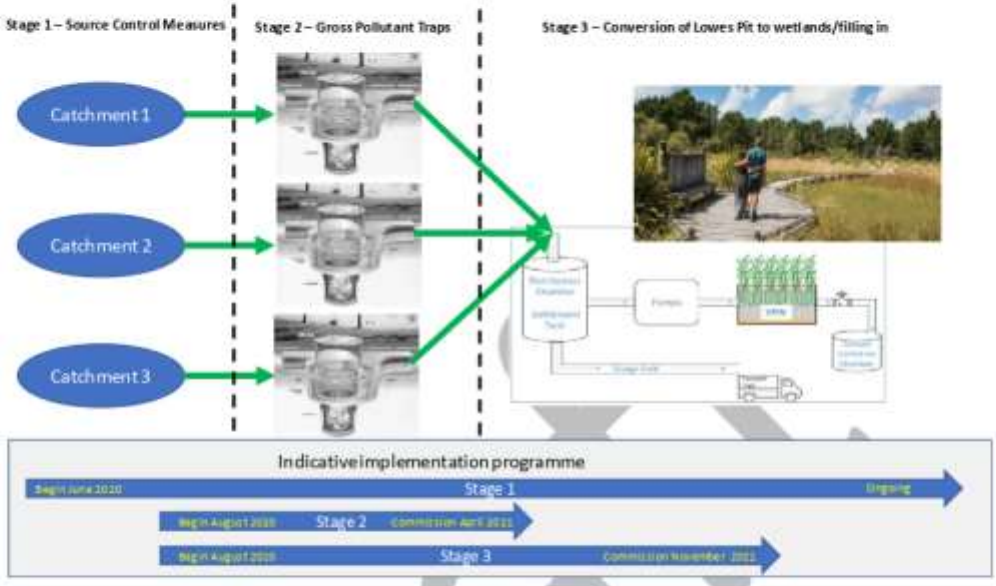


Figure E1: Recommended options implementation plan for Scenario 1

Scenario 2 – HDC decides against implementation of an option of converting a portion of Lowes Pit into a vertical flow wetlands system and filling in the rest of the pit. For this scenario, the following options are recommended in the order of a proposed staged/ multiple risk barrier implementation plan. Figure E2 provides a conceptual schematic of this proposed plan.

- Stage 1 – implement Source Control measures as described in Section 6.1.1.
- Stage 2 – Construct stormwater catch pit inlet filtration systems for high traffic roadway sections (discussed in Section 6.1.2and roadway section subject to large volumes of sediments/wastes from construction and agricultural vehicles. It is estimated that a minimum of 4 sites will require stormwater catchpit inlet filtration systems, with each servicing approximately 2,000 m^2 of roadway surface (subject to detailed design).
- Stage 3 – Construct dry weather spill/first flush deflection system as discussed in Section 6.1.4.
- Stage 4 – Construct end of pipe treatment systems for Catchments 1, 2 and 3 using a higher end treatment system such as the Stormwater 360 Jellyfish as described in Section 6.1.3.

Total rough order cost for Scenario 2 options = $1.45M ex GST (see details provided in Section 6).

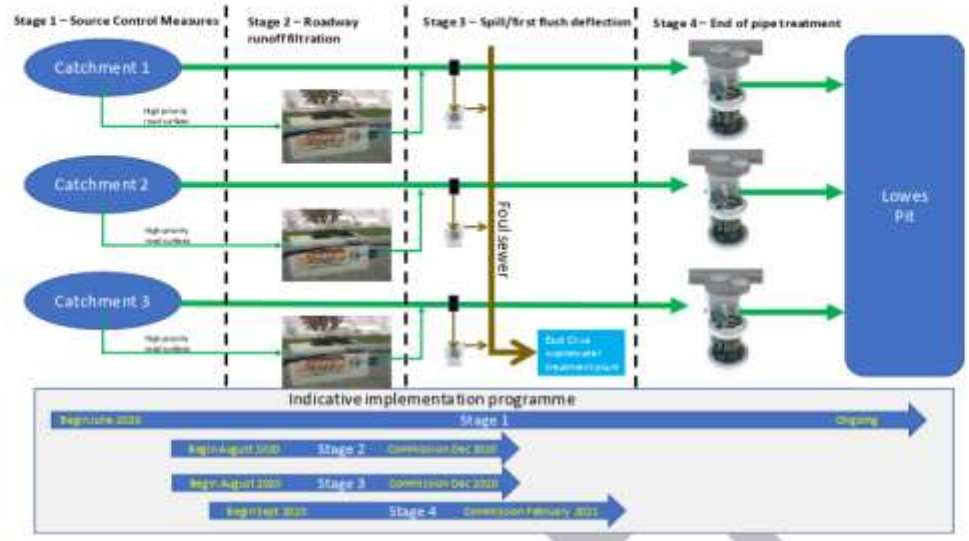


Figure E2: Recommended options implementation plan for Scenario 2

1 Overview

In December of 2019, HCD engaged Tonkin & Taylor Ltd and SCO Consultants to investigate risks associated with stormwater drainage into Lowes Pit, and to develop options for mitigating identified risks to appropriate levels. HDC requested an evaluation of risks along two primary lines:

- Potential for stormwater contaminants discharged into Lowes Pit to effect water quality in the Heretaunga Plains aquifer system.
- General effects of urban stormwater contaminants discharged to surface waterways as per urban stormwater management guidelines and regulations (e.g. Hawke's Bay Regional Council Waterway Guidelines for Stormwater Management).

The following report provides a summary of:

- Overview of potential stormwater pollution risks.
- Detailed investigations, surveys and sampling/monitoring completed.
- Risk assessments.
- A recommended risk mitigation plan.

This work builds from previous investigations and desktop studies, with a primary objective of developing additional science and evidence to confirm risk assessments and inform the development of proposed risk mitigation options.

2 General Location and Description

Lowes Pit (also known as Lake Lowe) is a man-made stormwater drainage pond located in the Flaxmere area just off of Omaha Road as shown on Figure 2.1 below. The physical address of Lowes Pit is 15 Hazelwood Street, Hastings, 4120.

Figure 2.1: General Location of Lowes Pit

Figure 2.2 below shows a closeup image of Lowes Pit. The pit has a surface area of around 10,000 m^2, and an average depth of approximately 1.5 m. At present there is no direct access for the general public, and the pit is surrounded by dense vegetation with very steep banks and only a few locations to access the water's edge. The bottom of the pit generally consists of a coarse gravel material (previously being used as a quarry), and the gravel is covered by a shallow layers of fine sediments and submerged vegetation.

Figure 2.2: Detailed View of Lowes Pit

Approximately 20 hectares (0.2 km^2) of heavily developed land drains to Lowes Pit and is comprised mostly of industrial/commercial properties. Figure 2.3 below shows the four main catchments which drain to the pit via a network of stormwater pipes, discharging at four key locations as shown.

Figure 2.3: Lowes Pit Stormwater Drainage Catchments

3 Overview of potential stormwater pollution risks

HDC instructed Tonkin+ Taylor and SCO Consultants to evaluate stormwater pollution risks associated with Lowes Pit related to the two following issues:

1 The likelihood that stormwater pollution which is discharged into the pit poses a risk to the Heretaunga Plains aquifer.

Urban stormwater pollution associated with catchments such as the one which drain to Lowes Pit can include such contaminants as pathogens from animals and humans, heavy metals, oils and other forms of hydrocarbons, sediments, nutrients, etc. Of particular is the potential for pathogens (which includes viruses, bacteria, etc.) to contaminate groundwater supplies located within the Heretaunga Plains aquifer. For this to happen, there needs to be a sufficient quantity of contaminants generated and a viable pathway between the surface stormwater pollution sources and the underlying aquifer system, as well as a lack of adequate barriers in place to mitigate risk to an appropriate level. The risk of this associated with Lowes Pit has been evaluated previously[1] as very low and is presented in further detail in the following section on risk assessments.

2 The general risk of pollution effects in line with urban stormwater management guidance and requirements such as the Hawke's Bay Regional Council Waterway Guidelines for Stormwater Management

Urban stormwater contaminants can result in effects to public and ecological health, community aesthetics and cultural values. The effects vary by the type and amounts of pollution generated, and the nature and sensitivity of waterways where they are discharged. Various guidance documents and policies have been developed to set out recommended stormwater management actions, and all stormwater discharges within Hastings District Council are operated under various consent requirements. The assessment of general urban stormwater risks have been conducted following guidelines provided by the Hawke's Bay Regional Waterway Guidelines for Stormwater Management – the objectives of which are referenced below. The assessment has considered the nature and state of Lowes Pit and its current use, as well as potential future uses based on recommended risk mitigation options which are ultimately implemented.

The primary objective of these guidelines is to outline and demonstrate the Hawke's Bay Regional Council's preferred design approach for structural stormwater management devices. Specifically this includes design guidance for water quality and water quantity ponds, wetlands, filtration practices, infiltration practices, bio filtration practices and other practices that may be used.

The guidelines also have the following secondary objectives:

1 To provide the reader with a summary of the principles of stormwater management including an outline of environmental effects and management concepts.

2 To outline the statutory process and introduce the rules in the Hawke's Bay Regional Council related to stormwater discharges.

3 To provide a resource guideline for those involved with the design, construction and operation of stormwater management devices.

4 To minimise adverse environmental effects of stormwater discharges through appropriate design, construction and operation of stormwater management practices.

[1] T+T, 10 December 2019. *Review of Lowes Pond water sampling data and assessment of risk to HDC borefield at Frimley Park.* Letter report prepared for Hastings District Council, Project No. 1007392.

4 Detailed investigations, surveys and sampling/monitoring completed

Following the initial assessment of risk and previous studies conducted in late 2019, T+T and SCO Consultants recommended a detailed field investigations and sampling programme to HDC for confirming risks and information for development of options. HDC agreed to the recommended plan, and in February of 2020 dry and wet weather investigations and sampling were completed and the results are presented as follows.

4.1 Overview of potential stormwater pollution sources

Urban stormwater drainage systems are subject to pollution contamination from a number of potential sources such as:

- Faecal matter from animals and/or humans.
  - Animal faecal matter can be deposited on land surfaces and directly into waterways, and in sufficient quantities can pose a risk to public health. In the Lowes Pit catchment likely sources of animal faecal matter include the numerous waterfowl resident in Lowes Pit, and ruminant animals (e.g. cows and sheep) who are present on the adjacent farmland. It is highly likely that farm vehicles travelling through the Lowes Pit catchments have animal faecal matter on the wheels which can easily be deposited on the roadways and then washed into storm drains when it rains.
  - Human faecal matter can be deposited into storm drain systems through defects in wastewater systems (e.g. leaks from broken sewer pipes), improperly connected plumbing and sewer system overflows which occur if the sewer system is overly hydraulically stressed or blocked. These sources can be present in storm drains in either dry or wet weather conditions.
- Heavy metals, oils, hydrocarbons, nutrients, etc from sources like zinc coated rooftops, fertilizers, industrial/commercial processes, vehicle brake pads, leaking oils, etc. These sources can be present in either dry or wet weather conditions, and also can be intermittent (e.g. a spill event of hazardous material which goes into a storm drain).

As discussed, these sources can be active and present in either dry or wet weather conditions. It is therefore important that investigations, sampling and testing are conducted in both dry and wet weather conditions to confirm the various sources – as this evidence can then be used to develop appropriate mitigation actions ranging from source control/source elimination to various downstream barriers and treatment options. In terms of wet weather driven pollution, it is important to consider the typical "first flush" effects that commonly occur as a result of surface contaminant build up over time and then subsequent initial wash off when rainfall events occur. Studies of urban stormwater pollution have shown that the highest risk of effects occurs due to dry weather sources and first flush runoff that occurs with long dry periods followed by intense rain events. Figure 4.1 below provides an example of first flush stormwater pollution from wet weather event samples collected along a roadway following a long dry period. This also demonstrates how mitigation options can be focused on the first flush component to maximise the cost-benefit ratio of various treatment options.

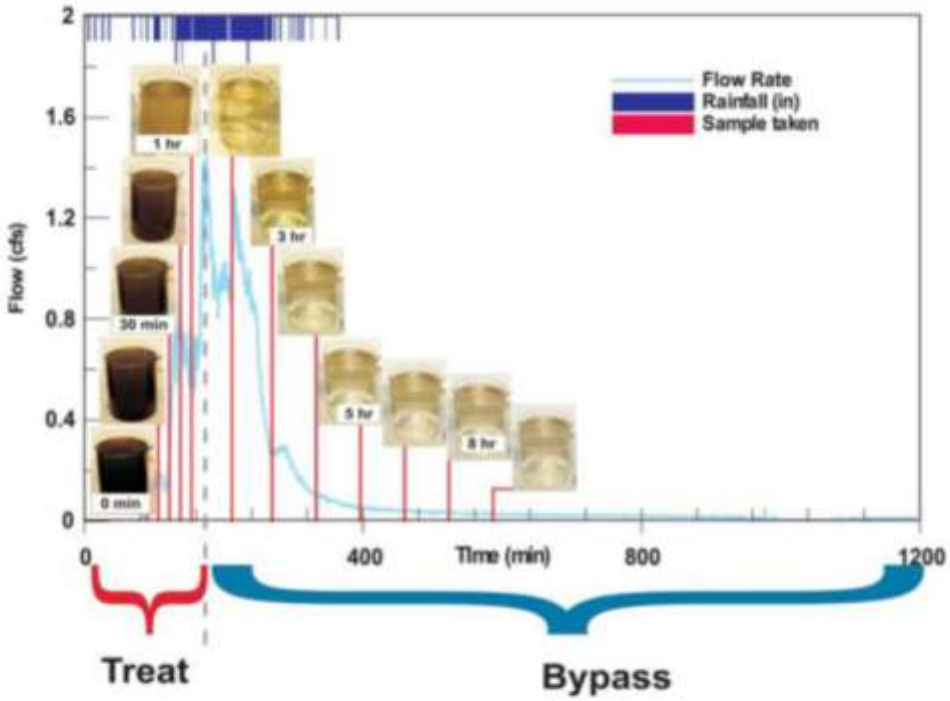


Figure 4.1: First flush pollution from typical urban stormwater runoff

4.2 Scope of work

Investigations, surveys and sampling/monitoring of Lowes Pit and the tributary catchments were conducted in February of 2020 by HDC staff and consultants from T+T and SCO. This work was conducted in both dry and wet weather conditions and included inspections/sampling within Lowes Pit and at several locations along the stormwater drainage networks as shown on Figure 4.2 below.

[2] California Department of Transportation study on first flush runoff & treatment strategies

Figure 4.2: Locations of inspections, sampling and testing

More specifically, the scope of work for inspections, sampling and testing included the following:

Dry weather conditions (Dry weather inspections, sampling and surveys were conducted on the 17th and 18th of February 2020:

- Confirming Lowes Pit stormwater catchment extents and drainage pathways.
- Visual inspections of roadways and stormwater drainage catch pits.
- Visual inspection of stormwater pipe network at numerous locations as shown in Figure 4.2.
- Sample collection when fluids observed in storm drains during dry weather.
- Water samples collected at different depths in Lowes Pit.
- Sediment samples collected at multiple locations from the bottom of Lowes Pit.
- Surveying of potential locations for end-of-pipe treatment options.
- Drone surveys of Lowes Pit including high resolution aerial photos, GPS mapping and surveys of the pit bottom using a sonar drogue attached to the drone.

Wet weather conditions:

- Collection of fluid samples within storm drains during wet weather conditions at multiple storm drain locations.
  - As of this date wet weather samples were collected at four storm drain locations on 5 March 2020. With only 12 mm of rainfall, this was a fairly small wet weather event.

- Additional wet weather sampling events are planned, ideally for larger storm events when this is feasible. Data from these events will be incorporated into the final design of mitigation options which are implemented.

Figures 4.3 through 4.5 show photos of field inspections, sampling and survey work competed as part of this project.

Figure 4.3: Setup of drone used for surveying Lowes Pit

Figure 4.4: Setup for sediments and water quality sampling in Lowes Pit

Figure 4.5: Storm drain in Lowes Pit catchment where dry weather sample was collected

4.3 Results and conclusion from inspections, sampling/testing and surveys

The following provides a summary of results and conclusions from the dry and wet weather inspections, sampling/testing and surveys completed in February and March of 2020. A summary is first presented for the storm drain network, followed by Lowes Pit. Samples collected in the storm drains and in Lowes Pit were analysed for the following parameters:

- Sediment samples
  - Heavy metals (As, Cd, Cr, Cu, Ni, Pb and Zn)
  - Polycyclic aromatic hydrocarbons (PAHs)
- Water samples
  - Heavy metals (As, Cd, Cr, Cu, Ni, Pb and Zn)
  - Pesticides
  - PAHs
  - Turbidity
  - Total suspended solids (TSS)
  - Total nitrogen (TN)
  - Ammoniacal nitrogen
  - Nitrate/nitrite
  - Total Kjeldahl Nitrogen (TKN)
  - Total phosphorus (TP)
  - UV Absorbance at 254 nm
  - UV Transmittance at 254 nm
  - Escherichia coli (E.coli)

In addition, a subset of E.coli bacteria samples collected within the storm drain network were submitted for specialised quantitative polymerase chain reaction (qPRC) testing to determine the origin of the bacteria. As E.coli is present in the gut of all warm blooded animals, qPRC testing uses DNA markers to determine if the bacteria came from human, avian, canine, ruminant (e.g. cows and sheep) or other animals sources. This is extremely useful in identifying the source of faecal material waste, the risk that these source pose on public health, and informing development of options to mitigate and/or treat these sources.

Storm Drain Network

Results and conclusions from inspections, sampling and testing of the storm drain networks within Lowes Pit catchments are summarized as follows:

There is no evidence of human waste present in the storm drains in dry weather conditions. This indicates that there are no improper private foul sewer plumbing connections, and that the existing public foul sewer system is in good structural condition and not leaking into the storm drains.

Elevated E.coli bacteria levels that are consistent with other urban storm drain system data were observed in both dry and wet weather conditions. qPCR testing for a subset of wet weather samples indicates that the sources of bacteria are predominantly ruminant animals (e.g. cows, sheep). Given that adjacent farmland runoff generally drains away from the Lowes Pit catchments, it is likely that ruminant animal waste is deposited onto Lowes Pit catchment roadways from farm vehicles driving through this area and subsequently washed into storm drain when it rains.

During dry and wet weather sampling, metals and nutrient concentrations were detected at both the northern (Catchment 2) and southern pipe outlet (Catchment 1) of the stormwater network, with significant peaks in nutrient concentrations in both the northern and southern pipe outlets. Levels of certain heavy metals (e.g. dissolved zinc) are high for Catchment 1 in comparison to other industrial locations around New Zealand. Pesticides were not detected in either of the stormwater pipe outlets, but a detectable concentration of pyrene (a PAH) was present at the northern outlet. Like most PAHs, pyrene is used to make dyes, plastics and pesticides.

There is a distinct and recurring volatile odour present in the drain running along Hazelwood Street (Catchment 1) consistent of bitumen or some other source of petroleum-based compound. There is no visual evidence of this material, but pyrene was detected in water samples which may be the source of this odour.

Total suspended solids (TSS) measured in wet weather conditions are generally low compared to data from other industrial catchments. Results ranged from 30 mg/l to 132 mg/l from the four sampled locations. By comparison, TSS measured from industrial car park runoff in Christchurch ranged from a low of over 100 mg/l to a high of 3,000 mg/l – with an average of over 1,000 mg/l. It is worth noting that TSS levels for Lowes Pit catchments may be higher for more intense storm events, and as such options should be conservatively designed to account for this. This is supported by historic aerial photos available on the internet which show high turbidity levels in Lowes Pit likely following wet weather events – e.g. https://images.app.goo.gl/1uHUYn1ft6sd42MaA

The following Table 4.1 provides a summary of visual observations made during storm drain network inspections. The sampling location numbers correspond to Figure 4.2 above.

Table 4.1: Observations from dry weather sampling

Sampling location	Sample taken (Yes/No)	Observation
LOW01	No	Manhole was dry.
LOW02	No	Manhole was dry.
LOW2B	Yes	Standing water in manhole. Water was grey in colour and bubbling.
LOW2A	No	Manhole was wet. Not enough flow to collect a sample.
LOW3	No	Manhole has some inflow and was wet. Not enough to collect a sample.
LOW3A[1]	Yes	Single wet wipe found in manhole.
LOW04	Yes	Manhole had some standing water with two inflows from upstream.
LOW06[1,2]	No	Manhole was wet. Not enough flow to collect a sample.
LOW07	No	Manhole had no flow.
LOW07 – HUM[2]	Yes	Standing water in Humsceptor with some dampness around.
LOW08[1]	Yes	Manhole contained stagnant water. Pungent odour emanating from manhole.
LOW09	No	Manhole was bone-dry.
LOW10	No	Manhole was not located. Possibly covered over.
LOW11	No	Manhole was bone-dry.
LOW11A	No	Manhole was bone-dry, but pungent odour emanating from it.
LOW12	Yes	Inflow from LOW12A.
LOW12A	No	Manhole captures wash-down water used for cleaning tractors. At the time of the site visit the manhole was full and overflowed to LOW12.
LOW13[2]	No	Inflow from upstream.
LOW18[1]	Yes	Manhole had stagnant water in sump with some inflow from LOW04 direction.

1 – Additional sampling undertaken on 4 March 2020. Wet weather sampling.
2 – Additional sampling undertaken on 2 March 2020

Additional details for the storm drain sampling results can be found in Appendix 1.

Lowes Pit

Results and conclusions from inspections, sampling/testing and survey of Lowes Pit are summarized as follows:

- All sampling conducted in Lowes Pit occurred during dry weather conditions.
- Lowes Pit is fairly shallow in depth, with a range from less than 1m to just over 3m, and an average depth of 1.5 m.
- The pit is almost entirely covered with submerged weed growth, and some evidence of high amount of nutrient growth. Pollution from the storm drains likely provide constant source of nutrients which accelerate weed growth, and there are likely cases of surface algae growth under certain conditions.

- Lowes Pit is closed off by security fencing, and access to the water's edge is generally limited due to the steep banks surrounding the pit. Surrounding vegetation is dense, which limits the aesthetic value of the waterway.
- According to the HDC Intramaps GIS system, the property (15 Hazelwood Street) which Lowes Pit sits on is 1.6712 ha in area, and has a rated capital value of $78,000. The zoning is shown as "General Industrial", and the property is owned by HDC.
- Sediment samples were collected from sites LOW14, LOW15 and LOW16 as shown on Figure 4.2 above. Sediment samples collected from LOW14 and LOW16 tested below the ANZECC sediments low trigger values (ANZECC, 2000) for all metals and total PAHs analysed – and therefore appear to be reasonably clean for these parameters. Sediments sampled at site LOW15 exceeded high trigger values for lead and zinc, and low trigger values for arsenic, chromium, copper and nickel. These values are very high from an ecological health risk and it is worth assessing if these values would class the sediments as "toxic" from a solid waste management or hazardous waste management perspective. Sediment samples were collected from the surface of the pit bottom and represent a recent history of pollution. It is reasonable to assume that the pollutants discharged from the stormwater drain that runs along Hazelwood Street (Catchment 1) is the source of the high metals concentrations found in the sediment collected from LOW15. This part of the stormwater network serves much of the industries that were developed with little to no regulation according to HDC staff. It is likely that these sources remain active given the recent nature of sediment tested.
- E.coli bacteria levels in the pit water samples were all below 100 cfu/100 mL (39 cfu/100 mL at the surface and 93 cfu/ 100 mL at the bottom), which is considered low by New Zealand fresh water standards. It is worth noting that bacteria levels may become more elevated during wet weather conditions when storm drain discharges are active.
- During the site visit a few hundred water birds were seen on the pit while water samples were being collected and this could be a source of the in-pit E.coli. However, since the E.coli counts in the pit were below 100 cfu/100 mL - with higher counts detected near the bottom of the pit – these samples were not sent for qPCR analyses for source identification (this test works best with bacteria levels > 1,000). It is likely that the numerous waterfowl remain a constant source of pathogens for Lowes Pit independent of storm drain pollution.
- In-pit pesticides concentrations were also below detection limit for the organochlorines that were analysed for. Arsenic concentrations were above detection limits, as well as traces of chromium, copper, lead nickel and zinc were also detected resulting in a degree of ecological impairment.
- Plant nutrient (total nitrogen and phosphorus) concentrations are also moderately elevated, which could lead to ecosystem degradation and likely driving the observed weed growth.

Additional details of these sampling results are presented in Appendix 1.

5 Risk assessments

A discussed in Section 3, a general assessment of risk has been conducted for the potential of stormwater pollution migrating from Lowes Pit to the HDC borefield at Frimley Park, and also the general risk of pollution effects in line with urban stormwater management guidance and requirements. The following provides a summary of these risk assessments.

5.1 Water Supply Risks

The likelihood that stormwater pollution which is discharged into the pit poses a risk to the HDC borefield at Frimley Park.

T+T has previously completed an assessment of risk to the HDC borefield at Frimley Park from Lowes Pit[1]. This assessment indicated concentrations of E coli originating from Lowes Pit at the borefield of below 10^{-15} cfu/mL and, therefore, that E coli risks to the Frimley Park borefield from Lowes Pit were very low. The predictions were based on modelled travel times between Lowes Pit and the borefield as well as likely attenuation of E coli in the subsurface. The predictions may be considered conservative due to parameter selection and the assumption that Lowes Pit is directly hydraulically connected to the confined aquifer in which the Frimley Park borefield is located.

Although the risk profile from Lowes Pit and conceptualisation of the aquifer system have not changed since the risk assessment referred to above was conducted, we recommend additional quantitative risk assessment be undertaken to assess general contaminant risks to the Heretaunga Plains aquifer system from contaminants originating from Lowes Pit.

5.2 General Urban Stormwater Pollution Risks

The general risk of pollution effects in line with urban stormwater management guidance and requirements

Various policies, guidelines and documents exist regarding urban stormwater management recommendations and guidelines (e.g. Hawke's Bay Regional Council Waterway Guidelines for Stormwater Management). A general assessment of urban stormwater pollution risk relative to these guidelines has been conducted on the basis of inspections, sampling and testing discussed in Section 4. The assessment of risks considers the magnitude and types of pollution sources in combination with the sensitivity and potential use of the waterway where stormwater discharges occur. Figure 5.1 below provides a general schematic of pollution sources and risks based on evidence gathered as part of this project.

Figure 5.1: Overview of general urban stormwater pollution sources and risks

Key sources and risks identified include:

- **Heavy metals – medium to high risk**

  Dissolved and particulate heavy metals have been detected in storm drains at elevated levels, consistent with levels observed from other industrial locations around New Zealand with little to no mitigation measures in place. In addition, high levels of heavy metals were detected in sediment samples gathered from the bottom of Lowes Pit at location Lowe 15 on Figure 4.2, well above ANZECC sediment quality threshold values. Likely sources of heavy metals include zinc rooftops, industrial site runoff, and roadway runoff (e.g. copper lined brake pads).

- **Sediments – medium to high risk**

  Sediments have been detected at relatively low levels in the storm drains as measure during a small rain event, but are likely much more elevated in larger events that mobilise additional sources in the Lowes Pit catchments. Evidence of this includes previous photos taken of Lowes Pit, such as the one shown in Figure 5.2 below which is a photo included in a 7 Sep, 2019 article in the New Zealand Herald regarding potential risk to the Heretaunga Plains aquifer (photo credit Paul Taylor). Figure 5.3 is another aerial photo of Lowes Pit from the HDC GIS IntraMaps system which also shows evidence of a sediment plume from a settling/treatment pond located on a cement processing site adjacent to the pit. Sources of sediments include industrial site runoff, a lack of and/or improperly operating industrial site sediment treatment systems, and road runoff including sediments from commercial vehicle wheels.

- **Polycyclic aromatic hydrocarbons (PAHs) and other industrial/commercial chemicals – medium to high risk**

  PAHs are a class of chemicals that occur naturally in coal, crude oil, and gasoline – and are commonly found in roadway runoff and industrial/commercial areas. Certain PAHs were detected in storm drains and in the sediments of Lowes Pit – some at moderately high levels as compared to ANZECC water quality and sediment guidelines. Sources include industrial processes, vehicles, etc. and given there are no effective PAH treatment systems or barriers in place in the Lowes Pit catchments – accidental spills which could reach the waterway also are a potential risk.

- **Nutrients – low to medium risk**

  Nitrogen and phosphorus were detected in storm drain and pit water samples. Pit water samples had generally low to medium levels of nutrients (per NPSFM guidelines - B and C grade for phosphorus, A to B grade for nitrogen) and elevated levels in the storm drains consistent with typical industrial catchments. Nutrient sources include industrial site and roadway runoff – with a potentially larger contribution from farm vehicle wheels that pick up mud/dirt and deposit it along catchment roadways. Nutrients discharged into Lowes Pit are likely causing the growth of submerged weeds throughout the waterway, but low aquatic ecological value of this waterway limits the risk of nutrient effects.

- **Pathogens – low**

  A pathogen or infectious agent is a biological agent that causes disease or illness to its host. Typically, the term is used to describe an infectious microorganism or agent, such as a virus, bacterium, protozoan, prion, viroid, or fungus. The potential presence of pathogens in stormwater and waterways is typically assed by sampling and testing for indicator organisms which are present in warm blooded animal gut bacteria and indicative of faecal matter being present. This same matter can also potentially contain harmful pathogens, so the presence and magnitude of indicator bacteria which can be easily tested for provides a general understanding of human health risk. For this project E. coli was used as an indicator organism. Samples collected in storm drains in dry and wet weather were found to have moderately elevated levels of E. coli, consistent with typical values found in other industrial and urban catchments. Additional DNA testing was done for some of the E. coli samples to confirm the origin, and in all cases results show the likely sources as ruminant animals (e.g. cows and sheep), likely coming from farmland soils which are deposited on Lowes Pit catchment roadways. Another key source are the waterfowl which are present in large numbers on the Lowes Pit waterway. Samples collected during dry weather conditions in water from the surface and bottom of the pit show low levels of E. coli according to New Zealand contact recreation guidelines. The level of public health risk is a function of viable pathogens being present in sufficient quantities, and the likelihood of exposure to humans. In the case of Lowes Pit, this risk is rated as low based on the limited access to Lowes Pit, and the non-recreational nature of this waterway. The risk of contamination of the aquifer water supply is discussed in section 5.1 above.

A water body in an industrial part of Hastings has been identified as a "potential risk" to the Heretaunga Plains aquifer. Photo / Paul Taylor.

Hawkes Bay Today
By: Astrid Austin, Astrid Austin

Figure 5.2: New Zealand Herald photo indicating sediment plumes in Lowes Pit

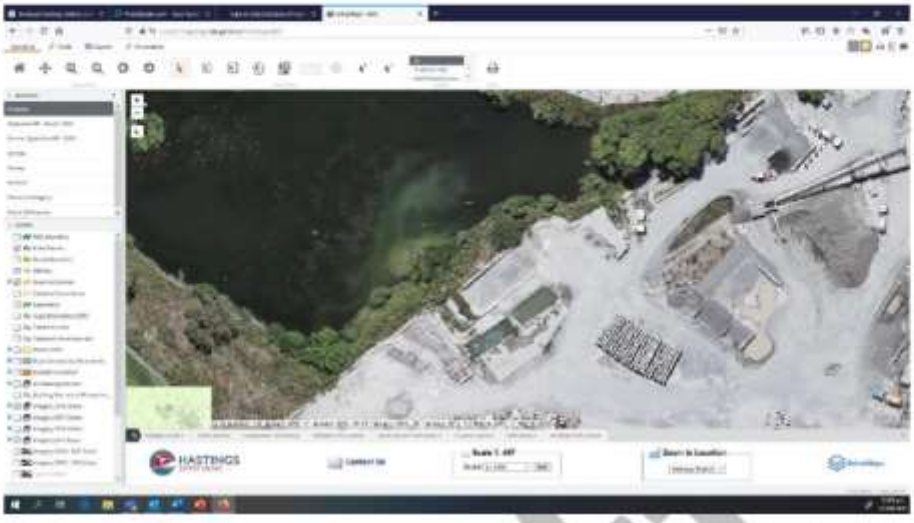


Figure 5.3: Aerial photo from HDC IntraMaps GIS system showing evidence of a sediment plume in Lowes Pit

6 A recommended risk mitigation plan

Various options have been assessed to mitigate identified risk of stormwater pollution sources and potential effects. Assessment of options and development of a recommended risk mitigation plan have carefully considered the levels of risks, requirements set forth in various local/regional/national guidelines for stormwater pollution and water security management, precedence for management of stormwater pollution in other HDC waterways, and future potential uses of the Lowes Pit waterway.

6.1 Summary of stormwater pollution risk mitigation options assessed

A range of options for mitigating identified stormwater pollution risk have been identified and assessed. These options range from source control measures to end of pipe treatment solutions, as well as filling in Lowes Pit to converting a portion of it to a natural wetlands treatment system. The range of options assessed provide HDC with the flexibility to take a staged multi-barrier approach for managing risks in a prioritised and adaptable manner. These options are summarised below, followed by a recommended plan as presented in Section 6.2.

6.1.1 Source controls

These options include a range of management, operational and policy intervention measures that can be implemented to reduce and/or eliminate identified stormwater contaminants at the point of source. Examples of this include:

a Review, modification and enhanced enforcement of industrial/commercial stormwater management consents. This includes assessment of existing stormwater treatment systems to ensure they are functioning properly in all conditions and being appropriately maintained, as well as the potential requirement for new on-site treatment systems. Visual and sampling/laboratory evidence collected as part of this project shows that industrial site runoff is likely a large source of contaminants such as heavy metals, PAHs and sediments being discharged into Lowes Pit. Management and operational measures to refine and enforce site stormwater management consents is likely to be a cost effective means of reducing this pollution and the associated risks.

b Around New Zealand, there is a growing body of evidence that replacement of zinc rooftops with alternate materials will greatly reduce zinc being found in waterways. Samples collected from stormwater drains and Lowes Pit sediments confirms that there are very high levels of zinc, consistent with the substantial number of industrial/commercial metal rooftops in these catchments. Options for replacing and/or coating these roofs as part of normal roof repairs/replacement schedules likely provides a cost-effective measure for substantial reduction of zinc loads to Lowes Pit. Doing this as part of a normal maintenance/replacement schedule would minimise the cost burden imposed on private companies.

c Similar to zinc rooftops, there is also consideration of replacing copper lined brake pads with alternate materials like ceramics to reduce copper loads on waterways. Samples collected from stormwater drains and Lowes Pit sediments confirms that there are very high levels of copper, likely coming from roadway runoff which contains copper from vehicle braking action.

d Data collected to date indicates there is no human waste present in the storm drain systems during dry weather and small storm event conditions. Additional wet weather sampling is programmed for larger storm events, and if human sewage is detected for these events it may be prudent to identify and eliminate sources of sewage entering storm drain systems (e.g. sewer defects, high level surcharge bypass relief pipes, etc.). Again this action is only recommended if human sewage is detected in storm drains during subsequent sampling of larger storm events.

6.1.2 Roadway runoff treatment systems

It is now common practice throughout New Zealand to require treatment of roadway runoff prior to discharge into a storm drainage system, particularly for roads classed as "high traffic" zones. There are varying definitions of what is classed as high traffic roadways. For example, in Auckland the threshold is 5,000 vehicle counts per day to be classed as high traffic and require some form of roadway runoff treatment. In catchments such as the ones which drain to Lowes Pit, evidence shows that roadway runoff treatment should be considered even with lower traffic counts due to the additional contamination from industrial/commercial vehicles including mud and debris commonly found on tyre treads. Samples and laboratory results in storm drains and Lowes Pit water and sediments indicates that roadway runoff is likely to be a major source of stormwater pollution.

Options for treating roadway runoff prior to entering storm drains systems includes natural rain gardens, engineered rain gardens and various filtration/sediment removal systems which can be installed as part of modified catch pit inlet systems. Potential locations for roadway runoff treatment systems include catch pit inlets along Chatham Road and Hazelwood Street. This is subject to detailed site assessments to confirm local conditions and potential constraints (e.g. existing utilities). Cost estimates have been developed for two roadway runoff treatment options: natural rain gardens and engineered rain gardens using the Stormwater 360 Filterra model. These have been selected due to the beneficial aesthetic values, ease of installation, and relative ease of ongoing maintenance. They are also well proven systems in New Zealand.

Sizing and cost are based on an assumption of treating an average of 2,000 m^2 roadway surface area per unit, but this will vary site by site based on how much roadway area drains into a targeted catch pit inlet. These options can be scaled up or down depending on the total area of roadway treatment required. The sizes provide compliance with HBRC stormwater management guidelines which recommends use of the 90% rainfall depth which is approximately 17.5 mm for the Hastings District Council area per NZWERF, 2004 rainfall maps – see Figure 6.1 below. Figures 6.2 and 6.3 provide conceptual images of natural and engineered rain gardens. Engineered rain gardens provide advantages in terms of smaller footprints and higher efficiencies of treatment, but most have proprietary media that must be replaced periodically.

1 Stormwater 360 Filterra treating 2,000 m^2 of roadway surface area.
   a Size of Filterra unit = 4.0m X 2.1 m (standard unit sizing)
   b Estimated capital cost of Filterra unit = $50K (provided by Stormwater 360).
   This cost includes: installation, vault, media, engineered underdrain, mulch, plants, engineered rock, freight, commissioning and 1 year maintenance (2 visits).;This cost excludes GST.
   c Annual maintenance cost is approximately $50/$m^2$ = $1000 per unit per year.
2 Natural rain garden treating 2,000 m^2 of roadway surface area.
   a Size of natural rain garden = 2% of impermeable area (water quality volume standard) = 40 m^2.
   b Estimated capital cost = 40m2 X $700/$m^2$ = $28,000 (per cost data from "Understanding Cost and Maintenance of WSUD in New Zealand", July 2019, Sue Ira & Robyn Simcock.
   Costs include the costs of designing, consenting and constructing a rain garden.
   c Annual maintenance cost is approximately $20/$m^2$ = $800 rain garden per year

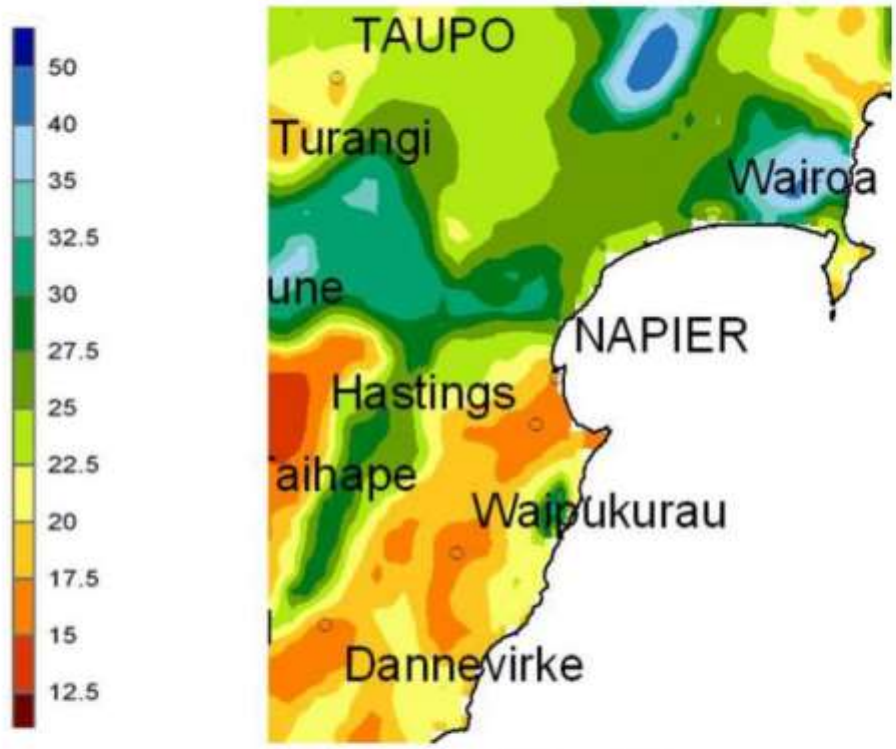


Figure 6.1: NZWERF 90% Rainfall depths for Hawkes Bay Region per HBRC stormwater guidance manual

Figure 6.2: Concept layout and treatment efficiency for Stormwater 360 Filterra roadway treatment systems

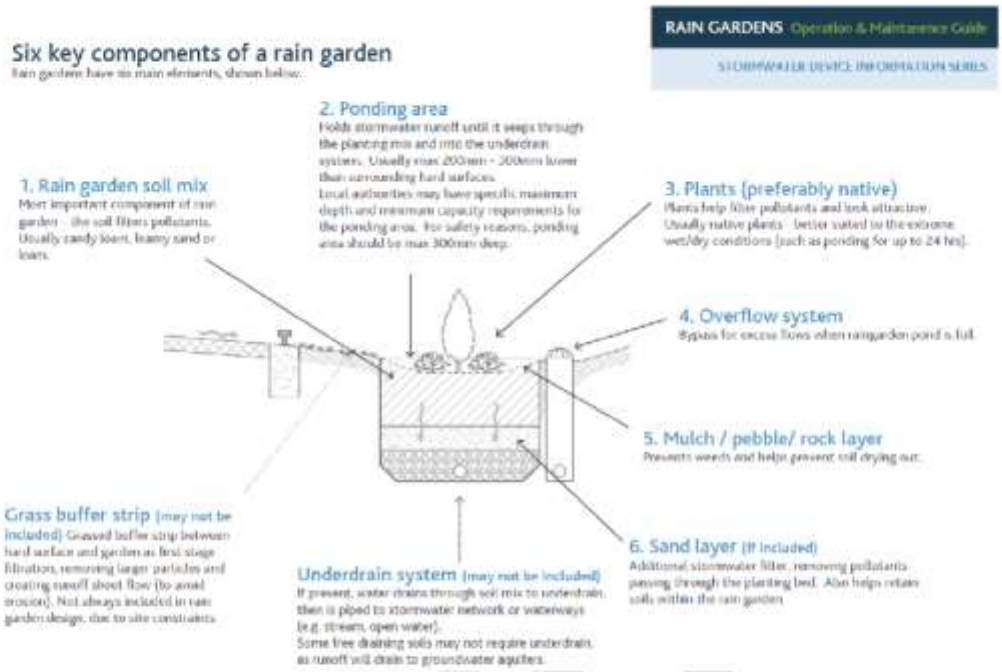


Figure 6.3: Concept layout for a natural rain garden

A well designed and well maintained natural rain garden should be capable of removing > 75% of total suspended solids. Reductions of heavy metals, PAHs and other compounds will vary on a site by site basis and as a function of the specific design of the rain garden including the media used – but can exceed 50% in well-functioning systems.

6.1.3 End of pipe treatment systems

A variety of technologies and systems are available to treat urban stormwater at the point of discharge from a stormwater drain outlet (aka "end of pipe"). Options for end of pipe treatment range from simple and low cost to highly complex and costly. This range typically reflect the degree of treatment that can be achieved, which ideally is a function of the amount of risk mitigation required. Locations for end of pipe treatment systems in Lowes Pit include the drain outlets for Catchments 1, 2 and 3 (see Figure 2.3 above). Catchment 4 is served by an existing on-site treatment pond which may not be working effectively under all conditions as evidenced by aerial photos (see Figure 5.3 above). Verification of proper maintenance and effectiveness of this treatment pond should be completed before consideration of alternative treatment systems. Catchments 1 and 2 currently have HumeCeptor (Humes New Zealand) stormwater gross pollutant traps which utilise hydraulic vortexing to remove solids and associated pollutant than can be settled. Previous studies indicate that these units are not working effectively, which is likely due to the hydraulic design (driving head across the units to provide sufficient energy) which is critical for this technology to work as designed. Options for alternative GPT technologies have been assessed (e.g. Hynds Downstream Defender), and selection of an optimal GPT is subject to a detailed design that involves analysis of required hydraulic conditions to maximise performance.

Sizing of the end of pipe treatment systems has been based on modelling of predicted stormwater flows discharging from the drains of Catchments 1, 2 and 3. A detailed report on this hydraulic analysis is included in Appendix 2. Results of this modelling are shown in Table 6.1 below. As mentioned in Section 6.1.2above, the 90% storm event depth was used to estimate peak flows per

the HBRC stormwater guidance manual. The depth of this storm for the Hawkes Bay Region is approximately 17.5mm per NZWERF (2004) as shown in Figure 6.1 above. Storm rainfall for the catchments were downloaded from NIWA's HIRDS version 4 database (see Table 6.1below), and then applied to a HEC-HMS model of the catchment to predict peak flows. The 90% storm depth of 17.5 mm is between a 2-year 1-hr and a 2-year 2-hr storm. Table 6.2 shows the results of the HEC-HMS model, and is followed by the interpolated peak flows used to size end of pipe treatment systems for Catchments 1, 2 and 3.

Table 6.1: Rainfall totals downloaded from NIWA's HIRDS version 4 database

ARI (years)	Storm depth (mm) for duration (hours)						
	1	2	3	6	12	24	48
2	15	21	26	36	48	62	79
5	21	29	35	48	63	82	104
10	25	35	42	57	75	97	122
20	30	42	50	67	88	112	140
50	37	51	61	81	105	133	165
100	43	58	69	92	119	150	184

Table 6.2: Simulated peak discharge from the catchments (Limited peak intensity hyetographs)

Catchment	CN 81: Peak discharge (L/s) for storm duration (hours)						
	1 hour	2 hour	3 hour	6 hour	12 hour	24 hour	48 hour
2 year ARI							
Catchment 1	5.9	36.8	55.3	96.6	138.7	157.9	138.2
Catchment 2	3.5	12.8	18.0	36.3	43.6	45.3	37.7
Catchment 3	2.2	6.3	10.2	19.5	22.0	22.5	18.4

Catchment	CN 88: Peak discharge (L/s) for storm duration (hours)						
	1 hour	2 hour	3 hour	6 hour	12 hour	24 hour	48 hour
2 year ARI							
Catchment 1	58.4	116.8	148.8	208.2	228.6	223.7	174.6
Catchment 2	26.4	45.2	61.1	71.2	66.7	61.7	46.8
Catchment 3	14.8	25.9	35.5	36.8	33.1	30.3	22.8

** Runoff from the catchments was simulated using the SCS Unit Hydrograph with SCS CN loss function (with CN of 81 and 88 and Ia 20% of soil storage).*

Based on the peak flows results above, the following peak flows were conservatively estimated for Catchments 1, 2 and 3 to be compliant with the HBRC guidelines of using the 90% storm depth for stormwater treatment measures.

- Catchment 1 design peak flow = 75 l/s
- Catchment 2 design peak flow = 35 l/s
- Catchment 3 design peak flow = 20 l/s

The following end of pipe treatment options have been assessed based on the results of modelling, sampling and investigations completed for this project, as well as the assessment of risks which

considers the nature of Lowes Pit and future potential uses. Final selection and design of a specific end of pipe treatment option (e.g. GPTs) is subject to a more detailed analysis of specific site conditions including required hydraulics. Disinfection systems (e.g. ultraviolet light units) can be included with end of pipe stormwater treatment systems to boost pathogen reduction levels, but were not included in this options assessment due to:

- The extremely low risk of pollution in Lowes Pit effecting the Heretaunga Plains aquifer.
- The existing disinfection barrier system in place for water supplied from the aquifer groundwater systems.
- Very low public health risk of Lowes Pit due to limited access and non-public use designation (swimming of fishing).
- Residential waterfowl population which serves as a constant source of pathogens directly into Lowes Pit water – regardless of end of pipe discharges and treatment applied.

1 Hynds First Defense High Capacity (FDHC) Vortex Separator – see Figure 6.4 below – "The First Defense® High Capacity is an enhanced vortex separator that combines an effective stormwater treatment chamber with an integral peak flow bypass. It efficiently removes sediment total suspended solids (TSS), trash and hydrocarbons from stormwater runoff without washing out previously captured pollutants." Removal efficiencies exceeding 80% on particulate contaminants down to 75 micron.

a Required sizes:

i Catchment 1 - Ø1800 FDHC @ 95.7 L/s

ii Catchment 2 - Ø1200 FDHC @ 42.4 L/s

iii Catchment 3 - Ø1200 FDHC @ 42.4 L/s

b Estimated capital cost:

i Catchment 1 Ø 1800 FDHC = $50,000*

ii Catchment 2 Ø 1200 FDHC = $35,000*

iii Catchment 3 Ø 1200 FDHC = $35,000*

**Ex GST. Assumes two times the vendor supplied cost of the unit to include design, consenting, 15% contingency, contractor mark-up and construction. Assumes minimal dewatering and temporary works costs.*

c Operations and maintenance - Small service truck for the removal of excess fluids @$200/hr including travel – allow three hours per site

Figure 6.4: Hynds First Defense High Capacity (FDHC) Vortex Separator

2 Hynds Downstream Defender (DD) – see Figure 6.5 below – "Designed to meet most stormwater regulations, the Downstream Defender® uses a vortex which is induced from the incoming tangential flow. Pollutants are directed towards the sump of the chamber while treated flow travels around the inner annulus to the outlet." Removes sediments, floatables,

oils and grease. Removes up to 60-90% Total Suspended Solids (TSS) with a mean particle size of 150 microns. Higher rates of hydrocarbon capture (and retaining) in storm events.

a Required sizes:

i Catchment 1 - Ø1800 DD @ 85 L/s

ii Catchment 2 - Ø1800 DD @ 85 L/s

iii Catchment 3 - Ø1200 DD @ 20 L/s

b Rough order estimated capital cost:

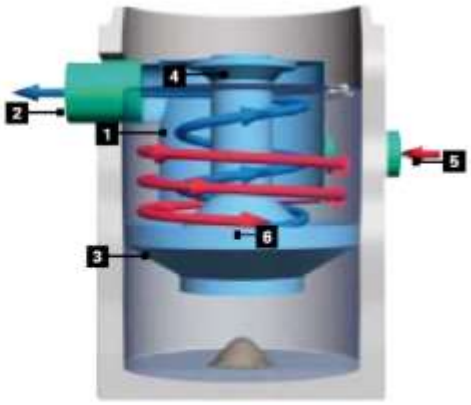
iv Catchment 1 DD Ø1800 = $60,000*

v Catchment 2 DD Ø1800 = $60,000*

vi Catchment 3 DD Ø1200 = $30,000*

**Ex GST. Assumes two times the vendor supplied cost of the unit to include design, consenting, 15% contingency, and construction (assumes minimal dewatering costs)*

c Operations and maintenance - Small service truck for the removal of excess fluids @$200/hr including travel – allow 3 hours per site



1. **Dip Plate Cylinder**
   Acts as an oil/floatables baffle.
2. **Outlet Pipe**
   Discharges treated stormwater from the inner annulus.
3. As the flow spirals around the vertical axis, sediment settles towards the base and is swept inward, along the benching skirt. Sediment then passes under the centre cone into the quiescent storage zone, beneath the vortex chamber.
4. **Floatables Lid**
   This covers the treated stormwater in the inner annulus between the dip plate and centre shaft. It isolates the oil/floatables collection zone, located between the dip plate and the manhole wall, from the treated stormwater.
5. **Tangential Inlet Pipe**
   Generates rotational flow. (see GA diagram)
6. As the main flow is directed inwards and upwards, the centre cone provides shelter for stored sediment, preventing re-entrainment.

Figure 6.5: Hynds Downstream Defender

3 Continuous Deflector Separator (CDS) Gross Pollutant Traps – see Figure 6.6 below - The CDS™ trap consists of an on-line stainless steel perforated separation plate placed in a hydraulically balanced chamber. Solid pollutants are retained in a central chamber under a mild vortex action, and drop into a basket for later removal and/or for removal using a grab bucket or extraction by a suction truck. Features of this system are that it can be installed underground and in such a way as to minimise head loss in flood flows and that high trapping efficiencies are predicted from laboratory tests.

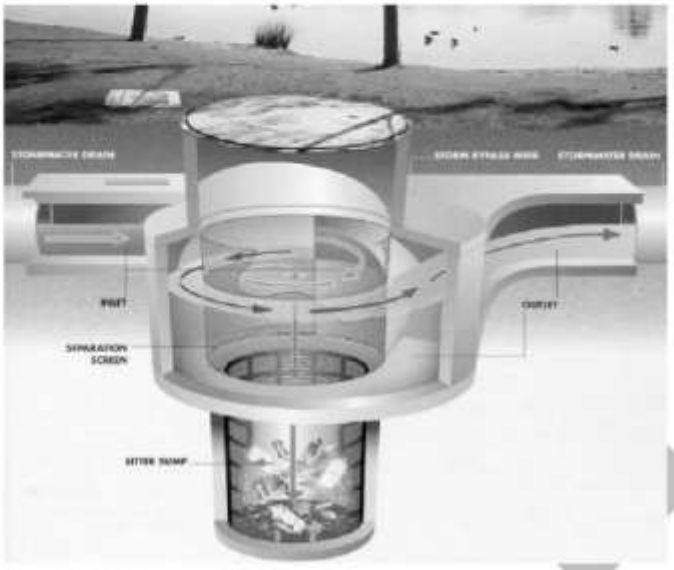


Figure 6.6: CDS gross pollutant trap

Recent discussions with Auckland Council Healthy Waters (stormwater division) indicate that CDS units are the preferred GPT technology based on their history of operating and maintaining them. CDS technology was developed in Australia and is currently owned by Rocla in Australia. Overseas rights were purchased by Contech (USA) and as of the date of this report it is uncertain who the current rep for CDS is in New Zealand, so preliminary concepts, sizing and cost estimates for Lowes Pit have not yet been developed – but can be done as part of a subsequent confirmation of the preferred GPT technology option completed as part of a preliminary design assessment and further consultation with HDC staff.

4 Stormwater 360 Jellyfish – see Figure 6.7 below - "The Jellyfish® Filter is a highly effective stormwater high-flow sediment removal device which uses membrane technology. The large surface area enables fine particle removal at high flows with low head. The filter has a number of 'tentacles' that catch and remove floatables, litter, oil, debris, TSS, silt-sized particles (as small as 2 microns), and a high percentage of particulate-bound pollutants; including phosphorus, nitrogen, metals and hydrocarbons." Approved for 80% removal TSS per Auckland Council performance requirements.

a Required sizes:

- i Catchment 1 – Design Flow rate 75 L/s – JFV-13-4 (54") with 460 mm driving head
- ii Catchment 2 – Design Flow rate 40 L/s – JF2300-7-2 (54") with 460 mm driving head
- iii Catchment 3 – Design Flow rate 20 L/s – JF1800-4-1 (54") with 460 mm driving head

b Rough order estimated capital cost:

- i JFV-13-4 (54") $440,000*
- ii JF2300-7-2 (54") $220,000*
- iii JF1800-4-1 (54") $130,000*

**Ex GST. Assumes two times the vendor supplied cost of the unit to include design, consenting, 15% contingency, and construction (assumes minimal dewatering costs).*

c Operations and maintenance – Example lifecycle and maintenance cost are outlined in Table 6.3 below. The maintenance of the Jellyfish system involves rinsing and washing the Jellyfish tentacles and removing the sediment from the sump by a trained contractor. The overall cost of maintenance can be reduced if you buy 2 sets of cartridges. With 2 sets of cartridges,

contractor can empty the sump/sediment of the system, replace the cartridges and clean the old cartridges at their yard. This will reduce staff and vacuum truck time on site, it will also reduce disturbance/interruption on site activity.

Figure 6.7: Stormwater 360 Jellyfish Unit

5 Stormwater 360 Filterra Bioscape Units – See Figure 6.2 above which includes treatment efficiencies

a Required sizes:

- i Catchment 1 – Design Flow rate 75 L/s - Filterra media footprint required is 120 m^2
- ii Catchment 2 – Design Flow rate 40 L/s - Filterra media footprint required is 64 m^2
- iii Catchment 3 – Design Flow rate 20 L/s – Filterra media footprint required is 32 m^2

b Rough order estimated cost (based on \$6,000/m^2 plus design, P&G and 20% contingency):

i Catchment 1 - \$1,150,000*

ii Catchment 2 - \$630,000*

iii Catchment 3 - \$350,000*

**Rough order cost ex GST with 50% added for design, P&G and contingency. Cost include a GPT for each catchment discharge which is recommended for this option.*

c Operations and maintenance – Example lifecycle and maintenance cost are outlined in Table 6.3 below.

Table 6.3: Example lifecycle cost for Stormwater 360 options

Stormwater360 Filters - Life Cycle Costing Estimates			
Treatment Area	20000	m2	
Flow Rate	23.611	L/s	
Product	StormFilter	Jellyfish	Filterra
Model	SF69-16-V-4515-15	JF1800-S-1	84m2
Number of units	1	1	16
Max Flow Rate (L/s)	24.456	27.5	23.611
Required number of Cartridge/Media Volume	16	6	18.122
Capital Cost	$ 48,000.00	$ 55,000.00	$ 200,000.00
Installation			
Maintenance frequency months	18 - 36	12	6
Cost per Replacement Cartridge/Mulch	$ 400.00	$ 1,200.00	$ 200.00
Year 1			
Inspection	$ 350.00	$ 350.00	$ 350.00
Vactor	$ 2,250.00	$ 1,980.00	$ -
Disposal of media/material	$ 630.00	$ 1,225.00	$ -
General/Replacement media/materials	$ 6,400.00		$ 4,000.00
Rinse Cartridges			$ -
Total Maintenance Cost	$ 9,630.00	$ 3,555.00	$ 4,350.00
Year 2			
Inspection	$ 350.00	$ 350.00	$ 350.00
Vactor		$ 1,980.00	$ -
Disposal of media/material		$ 1,225.00	$ -
General/Replacement media/materials			$ 4,000.00
Rinse Cartridges			$ -
Total Maintenance Cost	$ 350.00	$ 3,555.00	$ 4,350.00
Year 3			
Inspection	$ 350.00	$ 350.00	$ 350.00
Vactor	$ 2,250.00	$ 1,980.00	$ -
Disposal of media/material	$ 630.00	$ 1,225.00	$ -
General/Replacement media/materials	$ 6,400.00		$ 4,000.00
Rinse Cartridges			$ -
Total Maintenance Cost	$ 9,630.00	$ 3,555.00	$ 4,350.00
Year 4			
Inspection	$ 350.00	$ 350.00	$ 350.00
Vactor		$ 1,980.00	$ -
Disposal of media/material		$ 1,225.00	$ -
Replacement media/materials			$ 4,000.00
Rinse Cartridges			$ -
Total Maintenance Cost	$ 350.00	$ 3,555.00	$ 4,350.00
Year 5			
Inspection	$ 350.00	$ 350.00	$ 350.00
Vactor	$ 2,250.00	$ 1,980.00	$ -
Disposal of media/material	$ 630.00	$ 1,225.00	$ -
Replacement media/materials	$ 6,400.00	$ 6,000.00	$ 4,000.00
Rinse Cartridges			$ -
Total Maintenance Cost	$ 9,630.00	$ 9,555.00	$ 4,350.00
5 Year Total Cost	$ 77,590.00	$ 78,775.00	$ 221,750.00
5 year Maintenance Costs	$ 29,590.00	$ 23,775.00	$ 21,750.00
Annual Maintenance Costs Per Hectare	$ 2,959.00	$ 2,377.50	$ 2,175.00

6.1.4 First flush deflection/pump backs systems

This option essentially consist of a low pressure duplex grinder pump system to be installed at the three main drain outlet locations along the pit as per the image below. These pumps would collect all dry weather flows and intermittent spills/illicit discharges, plus a small amount of initial wet weather first flush – and would pump this flow back to the foul sewer system. Each pump has a peak flow equivalent to a few homes, so would likely not overload the sewers in the target conditions. The duplex grinder pumps each have a capacity of 0.6 l/s, and the pump wet wells can store 1337 litres. Based on very rough estimates, this capacity would handle the few first mms of rain for each catchment (ranging from say 1 mm to 2 mm for the larger West Catchment, and 2 to 4 mm for the two smaller eastern catchments). This would address the initial first flush component which generally has the highest contaminant loads, and would effectively provide 100% treatment for the pit for the dry weather and first flush quantity of flows and volumes diverted to the foul sewers. Figure 6.8 and Figure 6.9 on the next page provide conceptual layouts and details of the first flush deflection system option.

- Sizing – each of the three low pressure pump stations are based on an E-One Duplex 2014-iP dual pump. These pumping systems are arranged with a 1337 litre storage well, and the pumping capacity is 0.6 l/s. They discharge into a 110 mm (OD) uPVC pipe rising that can be easily constructed using a common surface trenching machine or a similar process to installing gas piping. Figure 6.10 on the following page shows a basic diagram for the E-One Duplex 2014-iP model.
- Rough order cost estimate - Our initial rough order cost estimate for this option (including a 20% contingency) is approximately $450K ex GST. This includes small GPT units, hydraulic diversion chambers, pumping units and rising main piping materials, and a high level estimate of construction cost with a 20% contingency. Cost include an allowance for design and consenting, and assume minimal cost for dewatering, temporary works and power connections.
- Operation and maintenance cost for this system are estimated at $5,000 per year, including the power cost for running the three pumping units. The expected life of a duplex grinder pump unit is approximately eight to ten years.

Figure 6.8: General layout of first flush deflection pump back system

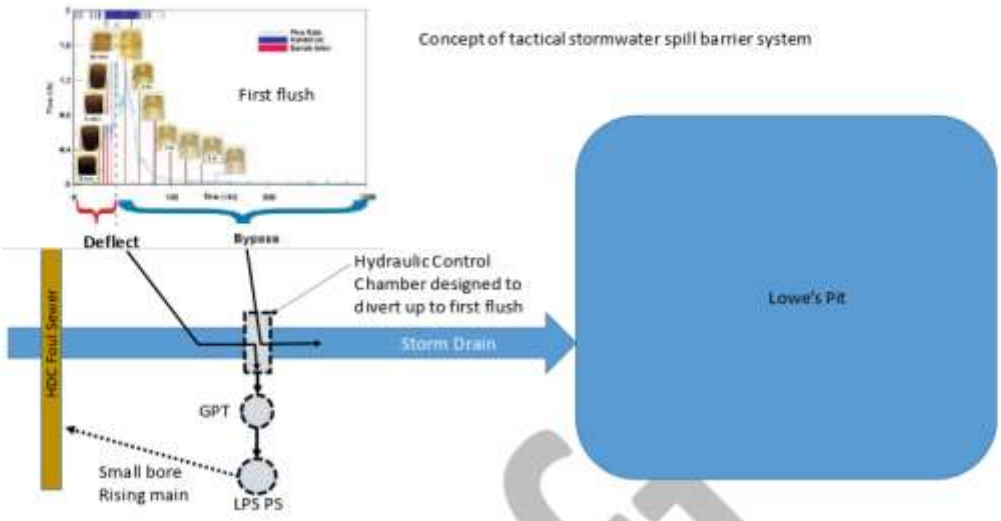


Figure 6.9: Concept design arrangement for first flush deflection system

- 32mm discharge
- Flow rate = 0.6 l/s
- Storage = 1337 litres

Figure 6.10: E/One Duplex low pressure grinder pump unit

6.1.5 Filling in portion of Lowes Pit and Conversion to Wetlands 6.1.5

This option consists of converting a portion of Lowes Pit to a vertical flow wetland (VFW), and filling in the remainder with an appropriate material. To be conservative, cost estimates have been developed based on a range of converting a portion of the pit to a VFW, to conversion of the entire pit to a VFW (VFW is more expensive than just filling the pit in). Stormwater discharges from Catchments 1, 2, 3 and 4 would be routed into the VFW through a hydraulic distribution system as detailed below. The VFW would provide a level of pollution removal and treatment for stormwater contaminants including heavy metals, sediments, pathogens, nutrients, etc – and would act as an additional barrier for protection of the Heretaunga Plains aquifer system (which presently has an extremely low risk of effects from Loews Pit).

For this option HDC can consider alternative uses of the pit which may include creating a public amenity area which offers aesthetic value. One potential consideration is use of the property for both community access and community educational uses focused on environmental and cultural values. These values should be considered in the overall business case of this option, including

monetisation of beneficial values which may offset capital and operational costs. Figure 6.11 through 24 below provide concept images of this option, and examples of vertical flow wetlands being implemented as part of a community access/aesthetics enhancement project. More details for this option are provided in Appendix 3.

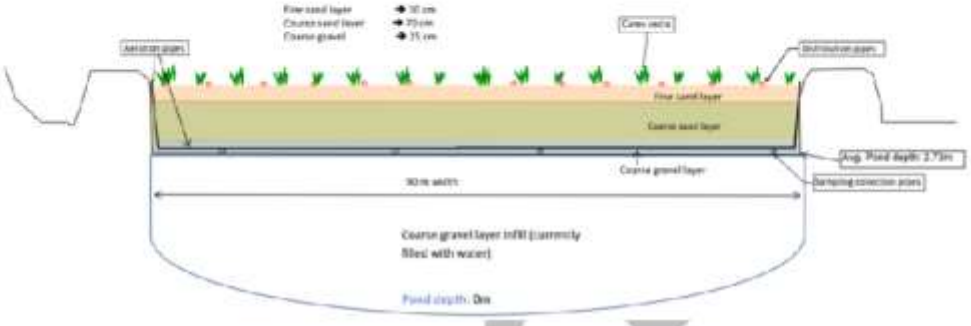


Figure 6.11: Indicative cross section of Lowes Pit conversion to a vertical flow wetland

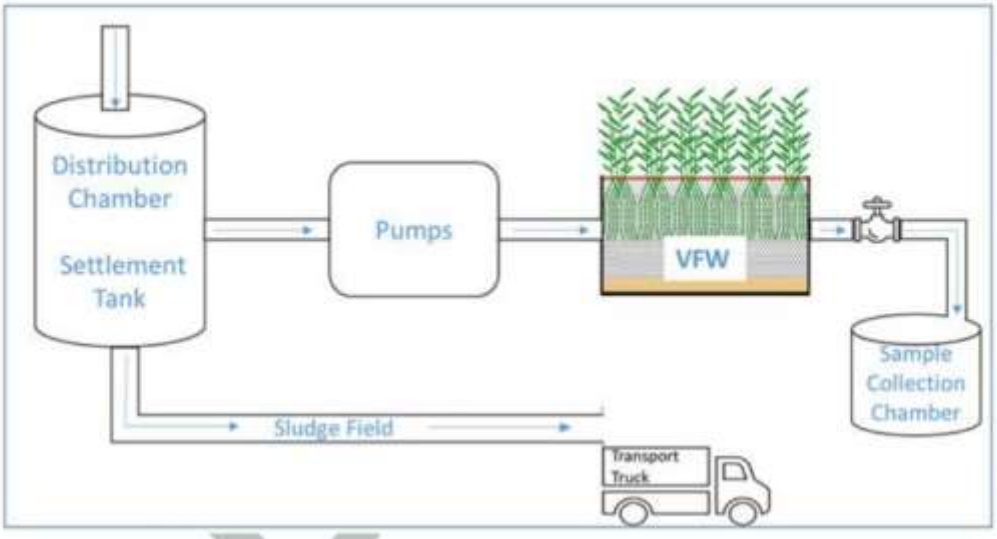


Figure 6.12: Schematic process flow diagram for a VFW system

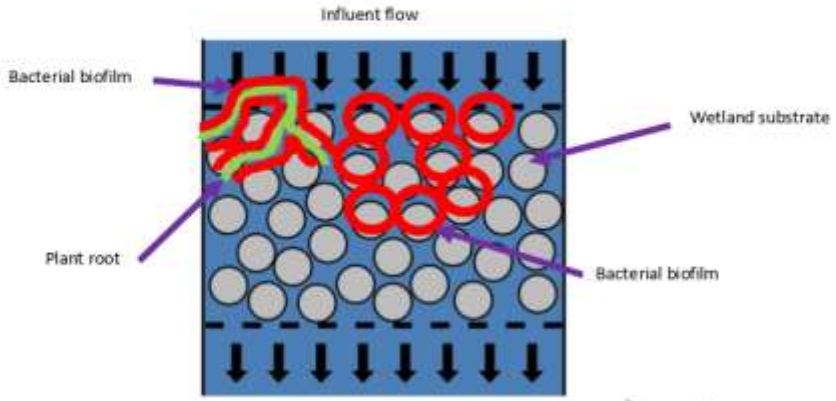


Figure 6.13: Natural pollutant removal processes for a VFW

Figure 6.14: Spencer Park Wetland Community Walk: Christchurch City Council

The following provides a general outline of the vertical flow wetland (VFW) concept for Lowes Pit. As mentioned previously, this is based on conversion of the entire pit to a VFW, but only a portion of the pit (approximately 25%) is required to provide effective stormwater quality treatment per HBRC guidelines.

- VFW Dimensions (if the entire pit is converted to a VFW)

  The wetland system has been designed to allow the maximum discharge volume to pass through it without causing flooding or overtopping of the VFW the wetland bay has been designed to allow a peak flows of 20,250 m^3 per day to pass through it. The VFW will consist of a single bay with a surface area of 8,100 m^2 and a volume of 10,125 m^3 (depth of 1.25 m) to allow the projected peak flow of 20,250 m^3/day to pass through it. This has been calculated assuming three layers of filter media, with a layer of fine sand on the surface, a medium grade sand layer in the middle of the profile and coarse stone at the bottom covering the collection pipes leading to a sampling bay.
- VFW hydraulics (if the entire pit is converted to a VFW).

  The flow rate through the wetland was calculated using Darcy's equation applied to particle sizes. Fine and medium sand were considered as filter media and the characteristics of these

materials as well as the calculated flow rates are listed below. The calculated flows are indicative of flow rates that could be accommodated by the VFW. Excessive flows may eventuate in heavy rain events or if the VFW filter media becomes clogged for any reason and percolation rates are reduced. In these cases the pit could overtop resulting in flooding around the Hazelwood Street area.

Table 6.4: VFW hydraulic estimates

Material	Particle size (mm)	Hydraulic conductivity (m/day)	Depth of medium in filter bed (m)	Porosity	Flow rate through bed (water level equal to level of fine sand layer) m^3/day
Coarse gravel	16-32	150	0.25	0.28	1,215,000
Coarse sand	0.5-1.0	45	0.70	0.39	364,500
Fine sand	0.125-0.25	2.5	0.3	0.43	20,250

Rough order cost estimate (if the entire pit is converted to a VFW)

Table 6.5 shows indicative rough order costs that have been prepared. This includes a base cost with an upper range of base cost + 50% to account for the level uncertainty at this stage in the design. Conversion of only a portion of the pit to a VFW will bring these costs down accordingly. As stated previously, a complete business case assessment of converting a portion of the pit to a VFW and filling in the rest to provide a community access aesthetic venue should carefully consider the beneficial value economics.

Table 6.5: Rough order cost estimates to convert Lowes Pit to a VFW

Description	Rough order cost (ex GST)	
	Base cost ($)	Upper cost ($)
Preliminary and General (20% of physical works)	380,000	570,000
Professional fees (15% of physical works)	345,000	517,500
Contingency (10% of physical works)	230,000	345,000
Vertical flow wetland[1]		
• Synthetic impermeable HDPE liner including geotextile top layer.	Not required	
• Wetland substrate and replacement costs. Including 300 mm fine sand layer, 700 mm coarse sand layer, 250 mm coarse gravel layer and infill of pit to winter groundwater level.	1,600,000	
• Pipe delivery, application, aeration and collection system. Including 110 mm diameter punched PVC pipe at 5 m centres.	90,000	
• Spillway/overflow structure to surface flow wetland. Including concrete beam weir and 70 m riprap lined overflow channel.	Not required	
• Outflow pipe to surface flow wetland. Including grade SN16 225 mm diameter pipe.	Not required	
• Planting (includes plant purchase, planting and one year of maintenance)	76,000	
Vertical flow wetland sub total	**1,766,000**	**2,649,000**
Pump station[2]		
• Supply and install wet well, access covers and interconnecting pipework to existing Humesceptor (settlement tank). Includes ground support, dewatering, temporary works, backfill, reinstatement, and chamber installation.	51,000	
• Supply and install pumps and pipe work in wet well.	36,000	
• Supply and install valve chamber, in-line air chamber and flow meter chamber. Includes concrete chamber, pipe work, valves and fittings.	27,000	
• Mechanical and electrical. Includes design, supply and installation of all mechanical and electrical fittings and equipment.	36,000	
Pump station sub total	**150,000**	**225,000**
Capital Expenditure Total	**$2,871,000**	**4,306,500**

6.2 Recommended stormwater pollution risk mitigation plan

The recommended stormwater pollution mitigation plan for Lowes Pit is modelled on a multiple barrier approach to mitigate identified risks to adequate levels. As discussed in Section 5, the two primary risks identified and assessed for this project are:

- Risk of stormwater pollution discharged to Lowes Pit effecting the Heretaunga Plans aquifer system. This risk has been assessed as extremely low given the nature of ground and hydrogeologic conditions, and the distance of separation between the pit and the aquifer. It is worth noting that the ground, HDC water treatment/disinfection and monitoring systems collectively act as a substantial multiple barrier to any risk of drinking water contamination. While any of the stormwater pollution reduction options assessed as part of this study would act as another barrier, the amount of additional risk reduction for the aquifer would be minimal.

- General risk of urban stormwater pollution on surface waterways per existing guidelines and regulations. This risk has generally been assessed as medium overall, and is somewhat tempered by the lack of public access and/or use of Lowes Pit, and the low ecological value of this manmade waterway. The following mitigation plan more than adequately mitigates identified general urban stormwater risks to appropriate levels based on existing guidelines and policies.

Recommended stormwater mitigation plans have been developed for two scenarios which are contingent on HDC's decision for the option of converting a portion of the pit to a wetlands and filling in the remainder. While this option is by far the most expensive - it provides potential co-benefits of community use/aesthetics, cultural values and eco-system enhancement. The co-benefits should be considered as part of a holistic business case assessment of this option. While this option does provide an additional barrier for water supply risk mitigation, the existing risk level is extremely low and likely does not justify the selection of this option as a singular driver.

Scenario 1 recommended plan – HDC chooses to convert a portion of Lowes Pit to a vertical flow wetlands system and fill in the remainder

For this scenario, the recommended plan consists of the following options and proposed stages of implementation which represent three additional barriers of risk mitigation in addition to the existing ones:

- Stage 1 – implement Source Control measures as described in Section 6.1.
- Stage 2 – construct gross pollutant trap systems on drain outlets for Catchments 1, 2 and 3 (e.g. Hynds First Defence High Capacity (FDHC) Vortex Separator or the Hynds Downstream Defender) as described in Section 6.1.3. Catchment 4 is served by an existing private treatment pond which should be inspected and confirmed as effective and well maintained, or replaced with a more effective treatment system.
- Stage 3 – Construct vertical flow wetlands (VFW) system to include approximately 25% (to be confirmed in detail design) of Lowes Pit as discussed in Section 6.1.5. Fill in remainder of pit with porous material and cover depending on intended future use (e.g. community access park).

Figure 6.15 shows a schematic of the recommended plan for Scenario 1. As discussed above, this scenario represents a recommended plan if HDC decide that the Stage 3 conversion of Lowes Pit to a wetlands system (filling in the remainder) is a preferred option given wider consideration of community views and potential co-benefits. Stage 1 Source Control measures is recommended as a practical and efficient first step option that should be implemented for both scenarios. The details of Stage 1 Source Control measures can be developed with due consideration of opportunities for a collaborative approach with local industries/businesses in the Lowes Pit stormwater catchments, and the Hawkes Bay Regional Council. An integrated stakeholder approach will likely yield the best outcomes for reduction of stormwater pollution at source. Stage 2 gross pollutant traps (GPTs) are recommended to reduce loads of contaminants prior to discharge to a wetlands system. Well-designed GPTs provide a cost-effective means of stormwater pollutant capture, and are relatively simple and low cost to maintain. It is recommended that Stage 2 is completed before Stage 3 is implemented.

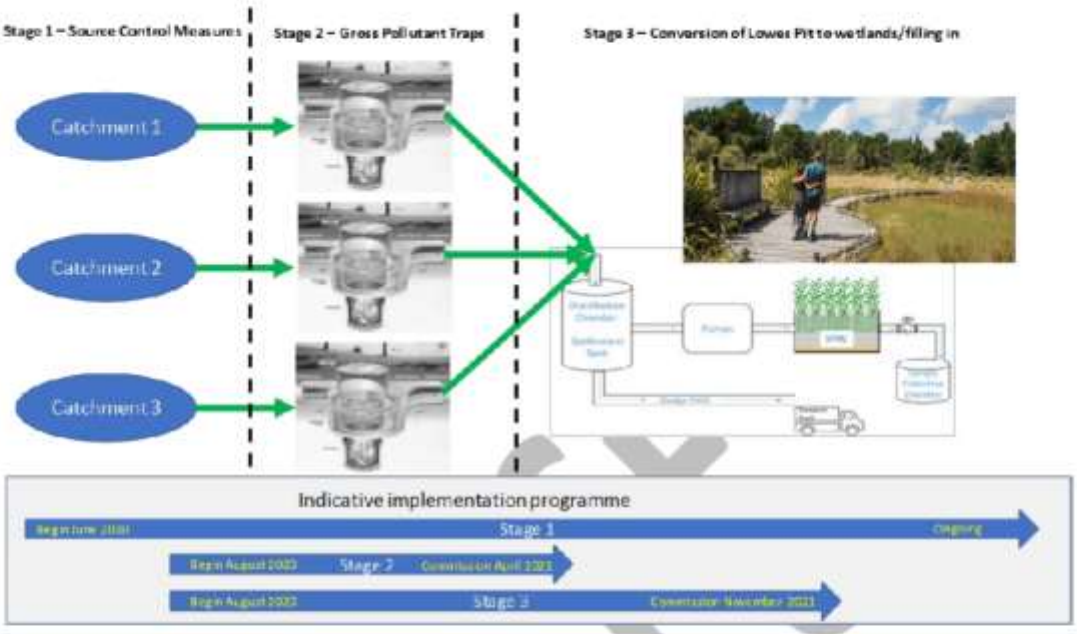


Figure 6.15: Recommended options implementation plan for Scenario 1

Rough order cost estimates have been developed for conversion of the entire Lowes Pit to a vertical flow wetlands – ranging from $2.9M to $4.3M as presented in Table 6.5 above. As discussed, only a portion of Lowes Pit is required for conversion to a wetlands system to meet stormwater treatment management guidelines – approximately 25%. The remainder of Lowes Pit can be filled in with a cheaper aggregate material and covered to be used for other purpose (e.g. public amenity park). As such, the rough order estimate for converting Lowes Pit is based on the lower range cost estimate – or approximately $2.9M. The rough order cost estimate for recommended gross pollutant traps is $150K, bringing the total rough order cost estimate of Scenario 1 to $3.05M (ex GST). Stage 1 – cost are assumed to be part of normal HDC operating budgets and options funded by private industry as needed (e.g. enhanced stormwater pond treatment for Catchment 4).

As also recommended, the business case for Scenario 1 should consider the economic value of co-benefits for conversion of Lowes Park to include community value, cultural value and ecological enhancement value. All rough order cost estimate are subject to change as part of the detailed design and tendering stages.

Scenario 2 recommended plan – HDC decided against conversion of Lowes Pit to a vertical flow wetlands system and filling in the remainder

For this scenario, the recommended plan consists of the following options and proposed stages of implementation which represent four additional barriers of risk mitigation in addition to the existing ones:

- Stage 1 – implement Source Control measures as described in Section 6.1.1
- Stage 2 – Construct stormwater catch pit inlet filtration systems for high traffic roadway sections (discussed in Section 6.1.2, and roadway section subject to large volumes of sediments/wastes from construction and agricultural vehicles. It is estimated that a minimum of 4 sites will require stormwater catchpit inlet filtration systems, with each servicing approximately 2,000 m^2 of roadway surface (subject to detailed design).
- Stage 3 – Construct dry weather spill/first flush deflection system as discussed in Section 6.1.4.

- Stage 4 – Construct end of pipe treatment systems for Catchments 1, 2 and 3 using a higher end treatment system such as the Stormwater 360 Jellyfish as described in Section 6.1.3.

Figure 6.16 shows a schematic of the recommended plan for Scenario 2. As discussed above, this scenario represents a recommended plan if HDC decides against conversion of Lowes Pit to a wetlands system (filling in the remainder). Stage 1 Source Control measures is recommended as a practical and efficient first step option that should be implemented for both scenarios. The details of Stage 1 Source Control measures can be developed with due consideration of opportunities for a collaborative approach with local industries/businesses in the Lowes Pit stormwater catchments, and the Hawkes Bay Regional Council. An integrated stakeholder approach will likely yield the best outcomes for reduction of stormwater pollution at source. Stage 2 construction of stormwater catch pit inlet filtration systems is recommended as a cost effective/practical/natural means of reducing high volume contaminants from roadway surfaces which will help to extend the life of recommended end of pipe treatment systems and also add an additional key risk barrier. Stage 3 construction of a dry weather spill/first flush deflection system is recommended as a lower cost/highly effective barrier for elimination of accidental/illicit spill risk and highly contaminated first flush runoff which represents a large proportion of wet weather runoff pollution loads and associated risk. Stage 4 higher level end of pipe treatment is recommended as a last stage risk mitigation barrier prior to discharge into Lowes Pit, which would include flows that bypass the first flush barrier system.

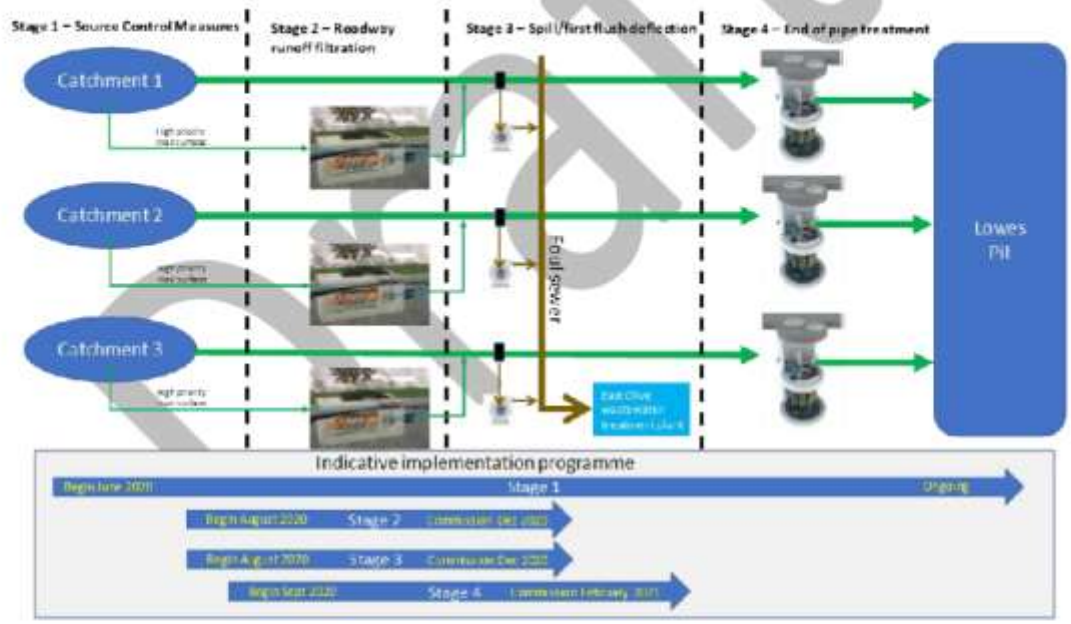


Figure 6.16: Recommended options implementation plan for Scenario 2

Rough order cost estimates ex GST for Scenario 2 are as follows (all are subject to change as part of the detailed design and tendering stages):

- Stage 1 – cost are assumed to be part of normal HDC operating budgets and options funded by private industry as needed (e.g. enhanced stormwater pond treatment for Catchment 4).
- Stage 2 – based on the Stormwater 360 Filterra option = $50K each X 4 units = $200K.
- Stage 3 – based on the E one low pressure sewer system and duplex grinder pump = $450K.
- Stage 4 – based on the Stormwater 360 Jellyfish filtration system = $800K.

Total cost for Scenario 2 = $1.45M

7 Applicability

This report has been prepared for the exclusive use of our client Hastings District Council, with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose, or by any person other than our client, without our prior written agreement.

Tonkin & Taylor Ltd

Report prepared by:	Authorised for Tonkin & Taylor Ltd by:
.....	.....
Clint Cantrell	Tony Cussins
Director, Sustainable Community Outcomes	Project Director

Report prepared by:

.....

Wageed Kamish

Senior Water Resources Engineer

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Appendix A: Detailed laboratory sampling results

Appendix 1 – Detailed laboratory sampling results

Lowes Pit Sediments

Hill Laboratories
TRIED, TESTED AND TRUSTED
R J Hill Laboratories Limited
28 Duke Street Frankton 3204
Private Bag 3205
Hamilton 3240 New Zealand
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E mail@hill-labs.co.nz
W www.hill-laboratories.com

Certificate of Analysis

Client:	Tonkin & Taylor	Lab No:	2324339
Contact:	Wageed Kamish	Date Received:	18-Feb-2020
	C/- Tonkin & Taylor	Date Reported:	24-Feb-2020
	PO Box 5271	Quote No:	102973
	Auckland 1141	Order No:	Wageed Kamish
		Client Reference:	
		Submitted By:	Wageed Kamish

Sample Type: Sediment

Sample Name:		Low 14 17-Feb-2020 12:00 pm	Low 15 17-Feb-2020 12:05 pm	Low 16 17-Feb-2020 12:10 pm		
Lab Number:		2324339.1	2324339.2	2324339.3		
Individual Tests						
Dry Matter	g/100g as rcvd	87	17.9	31	-	-
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn						
Total Recoverable Arsenic	mg/kg dry wt	6	23	7	-	-
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	1.24	0.22	-	-
Total Recoverable Chromium	mg/kg dry wt	15	109	27	-	-
Total Recoverable Copper	mg/kg dry wt	9	84	18	-	-
Total Recoverable Lead	mg/kg dry wt	21	370	14.7	-	-
Total Recoverable Nickel	mg/kg dry wt	8	25	17	-	-
Total Recoverable Zinc	mg/kg dry wt	105	1,470	68	-	-
Polycyclic Aromatic Hydrocarbons Trace in Soil						
Total of Reported PAHs in Soil	mg/kg dry wt	< 0.3	3.8	< 0.3	-	-
1-Methylnaphthalene	mg/kg dry wt	< 0.002	0.010	< 0.005	-	-
2-Methylnaphthalene	mg/kg dry wt	< 0.002	0.018	< 0.005	-	-
Acenaphthene	mg/kg dry wt	< 0.002	0.016	< 0.005	-	-
Acenaphthylene	mg/kg dry wt	< 0.002	0.043	< 0.005	-	-
Anthracene	mg/kg dry wt	< 0.002	0.042	< 0.005	-	-
Benzo[a]anthracene	mg/kg dry wt	0.003	0.178	0.005	-	-
Benzo[a]pyrene (BAP)	mg/kg dry wt	0.009	0.30	0.011	-	-
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	0.010	0.47	0.014	-	-
Benzo[e]pyrene	mg/kg dry wt	0.006	0.26	< 0.005	-	-
Benzo[g,h,i]perylene	mg/kg dry wt	0.008	0.36	0.009	-	-
Benzo[k]fluoranthene	mg/kg dry wt	0.003	0.162	< 0.005	-	-
Chrysene	mg/kg dry wt	0.004	0.22	0.006	-	-
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.002	0.056	< 0.005	-	-
Fluoranthene	mg/kg dry wt	0.006	0.37	0.012	-	-
Fluorene	mg/kg dry wt	< 0.002	0.024	< 0.005	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	0.008	0.35	0.007	-	-
Naphthalene	mg/kg dry wt	< 0.010	< 0.05	< 0.03	-	-
Perylene	mg/kg dry wt	0.015	0.159	0.011	-	-
Phenanthrene	mg/kg dry wt	0.002	0.144	0.008	-	-
Pyrene	mg/kg dry wt	0.008	0.59	0.012	-	-
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES	mg/kg dry wt	0.013	0.48	0.016	-	-
Benzo[a]pyrene Toxic Equivalence (TEF)	mg/kg dry wt	0.013	0.47	0.016	-	-

Lowes Pit Sediments, cont.

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request. Unless otherwise indicated, analyses were performed at Hill Laboratories, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Sediment

Test	Method Description	Default Detection Limit	Sample No
Environmental Solids Sample Drying*	Air dried at 35°C. Used for sample preparation. May contain a residual moisture content of 2-6%.	-	1-3
Environmental Solids Sample Preparation	Air dried at 35°C and sieved, <2mm fraction. Used for sample preparation. May contain a residual moisture content of 2-6%.	-	1-3
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn	Dried sample, <2mm fraction. Nitric/Hydrochloric acid digestion, ICP-MS, screen level.	0.10 - 4 mg/kg dry wt	1-3
Polycyclic Aromatic Hydrocarbons Trace in Soil	Sonication extraction, SPE cleanup, GC-MS SIM analysis. US EPA 8270C. Tested on as received sample. [KBIs:5784,4273,2695]	0.002 - 0.3 mg/kg dry wt	1-3
Dry Matter (Env)	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed). US EPA 3550.	0.10 g/100g as rcvd	1-3
Total Recoverable digestion	Nitric / hydrochloric acid digestion. US EPA 200.2.	-	1-3

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Dates of testing are available on request. Please contact the laboratory for more information.

Samples are held at the laboratory after reporting for a length of time based on the stability of the samples and analytes being tested (considering any preservation used), and the storage space available. Once the storage period is completed, the samples are discarded unless otherwise agreed with the customer. Extended storage times may incur additional charges.

This certificate of analysis must not be reproduced, except in full, without the written consent of the signatory.

Ara Heron BSc (Tech)
Client Services Manager - Environmental

Dry Weather Storm Drain and Pit Water Samples

Hill Laboratories
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Certificate of Analysis

Client:	Tonkin & Taylor	Lab No:	2324355
Contact:	Wageed Kamish	Date Received:	18-Feb-2020
	C/- Tonkin & Taylor	Date Reported:	25-Feb-2020
	PO Box 5271	Quote No:	102973
	Auckland 1141	Order No:	Wageed Kamish
		Client Reference:	
		Submitted By:	Wageed Kamish

Sample Type: Aqueous

Sample Name:		Low 14 - LOW 17-Feb-2020 10:20 am	Low 14 - UP 17-Feb-2020 10:40 am	Low 08 17-Feb-2020 12:05 pm	Low 07 - HUM 17-Feb-2020 12:35 pm	
Lab Number:		2324366.1	2324366.2	2324366.3	2324366.4	
Individual Tests						
Turbidity	NTU	17.6	0.87	24	11.7	-
Total Suspended Solids	g/m³	23	< 3	89	18	-
Total Nitrogen	g/m³	0.38	0.30	12.3	8.4	-
Total Ammoniacal-N	g/m³	< 0.010	< 0.010	9.2	7.2	-
Nitrite-N	g/m³	< 0.002	< 0.002	0.068	0.005	-
Nitrate-N	g/m³	< 0.002	< 0.002	0.149	0.022	-
Nitrate-N + Nitrite-N	g/m³	0.002	< 0.002	0.22	0.029	-
Total Kjeldahl Nitrogen (TKN)	g/m³	0.38	0.30	12.1	8.4	-
Total Phosphorus	g/m³	0.044	0.014	2.8	2.3	-
Absorbance at 254 nm	AU cm⁻¹	0.082	0.077	0.641	0.253	-
Transmittance at 254 nm*	%T, 1 cm cell	82.8	83.8	22.8	55.8	-
Escherichia coli	MPN / 100mL	93 [4]	39 [4]	16	> 2,420	-
Heavy metals, dissolved, trace As,Cd,Cr,Cu,Ni,Pb,Zn						
Dissolved Arsenic	g/m³	0.0011	0.0013 [4]	0.0034	0.0016	-
Dissolved Cadmium	g/m³	< 0.00005	< 0.00005	0.00017	< 0.00005	-
Dissolved Chromium	g/m³	< 0.0005	< 0.0005	< 0.0005	< 0.0005	-
Dissolved Copper	g/m³	< 0.0005	< 0.0005	0.115	0.0055	-
Dissolved Lead	g/m³	< 0.00010	< 0.00010	0.0031	0.00051	-
Dissolved Nickel	g/m³	< 0.0005	< 0.0005	0.0039	0.0036	-
Dissolved Zinc	g/m³	0.0024	< 0.0010	0.68	0.047	-
Heavy metals, totals, trace As,Cd,Cr,Cu,Ni,Pb,Zn						
Total Arsenic	g/m³	0.0019	0.0012 [4]	0.0071	0.0020	-
Total Cadmium	g/m³	< 0.000053	< 0.000053	0.00111	0.000094	-
Total Chromium	g/m³	0.0037	0.00059	0.0191	0.00127	-
Total Copper	g/m³	0.0033	< 0.00053	0.63	0.023	-
Total Lead	g/m³	0.0039	< 0.00011	0.081	0.0046	-
Total Nickel	g/m³	0.00104	< 0.00053	0.0181	0.0040	-
Total Zinc	g/m³	0.086	0.0014	8.7	0.22	-
Organochlorine Pesticides Screening in Water, By Liq/Liq						
Aldrin	g/m³	< 0.00010	< 0.00010	< 0.00010	< 0.00010	-
alpha-BHC	g/m³	< 0.0002	< 0.0002	< 0.0002	< 0.0002	-
beta-BHC	g/m³	< 0.0002	< 0.0002	< 0.0002	< 0.0002	-
delta-BHC	g/m³	< 0.0002	< 0.0002	< 0.0002	< 0.0002	-
gamma-BHC (Lindane)	g/m³	< 0.0002	< 0.0002	< 0.0002	< 0.0002	-
cis-Chlordane	g/m³	< 0.00010	< 0.00010	< 0.00010	< 0.00010	-
trans-Chlordane	g/m³	< 0.00010	< 0.00010	< 0.00010	< 0.00010	-
2,4'-DDD	g/m³	< 0.0002	< 0.0002	< 0.0002	< 0.0002	-

Dry Weather Storm Drain and Pit Water Samples, cont.

Sample Type: Aqueous						
Sample Name:		Low 14 - LOW 17-Feb-2020 10:20 am	Low 14 - UP 17-Feb-2020 10:40 am	Low 08 17-Feb-2020 12:05 pm	Low 07 - HUM 17-Feb-2020 12:35 pm	
Lab Number:		2324366.1	2324366.2	2324366.3	2324366.4	
Organochlorine Pesticides Screening in Water, By Liq/Liq						
4,4'-DDD	g/m³	< 0.0002	< 0.0002	< 0.0002	< 0.0002	-
2,4'-DDE	g/m³	< 0.0002	< 0.0002	< 0.0002	< 0.0002	-
4,4'-DDE	g/m³	< 0.0002	< 0.0002	< 0.0002	< 0.0002	-
2,4'-DDT	g/m³	< 0.0002	< 0.0002	< 0.0002	< 0.0002	-
4,4'-DDT	g/m³	< 0.0002	< 0.0002	< 0.0002	< 0.0002	-
Dieldrin	g/m³	< 0.00010	< 0.00010	< 0.00010	< 0.00010	-
Endosulfan I	g/m³	< 0.0002	< 0.0002	< 0.0002	< 0.0002	-
Endosulfan II	g/m³	< 0.0002	< 0.0002	< 0.0002	< 0.0002	-
Endosulfan sulfate	g/m³	< 0.0002	< 0.0002	< 0.0002	< 0.0002	-
Endrin	g/m³	< 0.00010	< 0.00010	< 0.00010	< 0.00010	-
Endrin aldehyde	g/m³	< 0.00010	< 0.00010	< 0.00010	< 0.00010	-
Endrin ketone	g/m³	< 0.0002	< 0.0002	< 0.0002	< 0.0002	-
Heptachlor	g/m³	< 0.00010	< 0.00010	< 0.00010	< 0.00010	-
Heptachlor epoxide	g/m³	< 0.00010	< 0.00010	< 0.00010	< 0.00010	-
Hexachlorobenzene	g/m³	< 0.0008	< 0.0008	< 0.0008	< 0.0008	-
Methoxychlor	g/m³	< 0.00010	< 0.00010	< 0.00010	< 0.00010	-
Total Chlordane [(cis+trans)* 100/42]	g/m³	< 0.0004	< 0.0004	< 0.0004	< 0.0004	-
Polycyclic Aromatic Hydrocarbons Screening in Water, By Liq/Liq						
Acenaphthene	g/m³	< 0.00010	< 0.00010	< 0.00010	< 0.00010	-
Acenaphthylene	g/m³	< 0.00010	< 0.00010	< 0.00010	< 0.00010	-
Anthracene	g/m³	< 0.00010	< 0.00010	< 0.00010	< 0.00010	-
Benzo[a]anthracene	g/m³	< 0.00010	< 0.00010	< 0.00010	< 0.00010	-
Benzo[a]pyrene (BAP)	g/m³	< 0.00010	< 0.00010	< 0.00010	< 0.00010	-
Benzo[b]fluoranthene + Benzo[j] fluoranthene	g/m³	< 0.00010	< 0.00010	< 0.00010	< 0.00010	-
Benzo[g,h,i]perylene	g/m³	< 0.00010	< 0.00010	< 0.00010	< 0.00010	-
Benzo[k]fluoranthene	g/m³	< 0.00010	< 0.00010	< 0.00010	< 0.00010	-
Chrysene	g/m³	< 0.00010	< 0.00010	< 0.00010	< 0.00010	-
Dibenzo[a,h]anthracene	g/m³	< 0.00010	< 0.00010	< 0.00010	< 0.00010	-
Fluoranthene	g/m³	< 0.00010	< 0.00010	< 0.00010	< 0.00010	-
Fluorene	g/m³	< 0.0002	< 0.0002	< 0.0002	< 0.0002	-
Indeno(1,2,3-c,d)pyrene	g/m³	< 0.00010	< 0.00010	< 0.00010	< 0.00010	-
Naphthalene	g/m³	< 0.0005	< 0.0005	< 0.0005	< 0.0005	-
Phenanthrene	g/m³	< 0.0004	< 0.0004	< 0.0004	< 0.0004	-
Pyrene	g/m³	< 0.0002	< 0.0002	< 0.0002	< 0.0002	-

Analyst's Comments

[#1] It has been noted that the result for the dissolved fraction was greater than that for the total fraction, but within analytical variation of the methods.

[#2] Please interpret this microbiological result with caution as the sample was > 24 hours old at the time of testing in the laboratory. The sample is required to reach the laboratory with sufficient time to allow testing to commence within 24 hours of sampling.

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request. Unless otherwise indicated, analyses were performed at Hill Laboratories, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Aqueous			
Test	Method Description	Default Detection Limit	Sample No
Filtration to obtain filter for ESR microbial source tracking*	Sterile filtration of water sample. Filter paper stored frozen in GITC Buffer, pending possible future microbial source tracking analysis.	-	1-2
Heavy metals, dissolved, trace As,Cd,Cr,Cu,Ni,Pb,Zn	0.45µm Filtration, ICP-MS, trace level. APHA 3125 B 23rd ed. 2017.	0.00005 - 0.0010 g/m³	1-4
Heavy metals, totals, trace As,Cd,Cr,Cu,Ni,Pb,Zn	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 23rd ed. 2017 / US EPA 200.8	0.000053 - 0.0011 g/m³	1-4

Dry Weather Storm Drain and Pit Water Samples, cont.

Sample Type: Aqueous			
Test	Method Description	Default Detection Limit	Sample No
Organochlorine Pesticides Screening in Water, By Liq/Liq	Liquid / liquid extraction, SPE (if required), dual column GC-ECD analysis	0.00010 – 0.0008 g/m³	1-4
Polycyclic Aromatic Hydrocarbons Screening in Water, By Liq/Liq	Liquid / liquid extraction, SPE (if required), GC-MS SIM analysis [KBRs:4736,2696]	0.00010 – 0.0005 g/m³	1-4
Filtration, Glass Fibre	Sample filtration through glass fibre filter.	-	1-4
Filtration, Unpreserved	Sample filtration through 0.45µm membrane filter.	-	1-4
Total Digestion	Nitric acid digestion. APHA 3030 E (modified) 23rd ed. 2017.	-	1-4
Turbidity	Analysis using a Hach 2100N, Turbidity meter. APHA 2130 B 23rd ed. 2017.	0.05 NTU	1-4
Total Suspended Solids	Filtration using Whatman 934 AH, Advantec GC-50 or equivalent filters (nominal pore size 1.2 - 1.5µm), gravimetric determination. APHA 2540 D (modified) 23rd ed. 2017.	3 g/m³	1-4
Filtration for dissolved metals analysis	Sample filtration through 0.45µm membrane filter and preservation with nitric acid. APHA 3030 B 23rd ed. 2017.	-	1-4
Total Nitrogen	Calculation: TKN + Nitrate-N + Nitrite-N. Please note: The Default Detection Limit of 0.05 g/m³ is only attainable when the TKN has been determined using a trace method utilising duplicate analyses. In cases where the Detection Limit for TKN is 0.10 g/m³, the Default Detection Limit for Total Nitrogen will be 0.11 g/m³.	0.05 g/m³	1-4
Total Ammoniacal-N	Phenol/hypochlorite colourimetry. Flow injection analyser. (NH_4-N = NH_4^+-N + NH_3-N). APHA 4500-NH_3 H (modified) 23rd ed. 2017.	0.010 g/m³	1-4
Nitrite-N	Automated Azo dye colorimetry, Flow injection analyser. APHA 4500-NO_2^- I (modified) 23rd ed. 2017.	0.002 g/m³	1-4
Nitrate-N	Calculation: (Nitrate-N + Nitrite-N) - NO2N. In-House.	0.0010 g/m³	1-4
Nitrate-N + Nitrite-N	Total oxidised nitrogen. Automated cadmium reduction, flow injection analyser. APHA 4500-NO_3^- I (modified) 23rd ed. 2017.	0.002 g/m³	1-4
Total Kjeldahl Nitrogen (TKN)	Total Kjeldahl digestion, phenol/hypochlorite colorimetry. Discrete Analyser. APHA 4500-N_{org} D (modified) 4500 NH_3 F (modified) 23rd ed. 2017.	0.10 g/m³	1-4
Total Phosphorus	Total phosphorus digestion, ascorbic acid colorimetry. Discrete Analyser. APHA 4500-P B & E (modified from manual analysis and also modified to include a reductant to reduce interference from any arsenic present in the sample) 23rd ed. 2017. NWASCO, Water & soil Miscellaneous Publication No. 38, 1982.	0.004 g/m³	1-4
Absorbance at 254 nm	Filtered sample. Spectrophotometry, 1cm cell. APHA 5910 B 23rd ed. 2017.	0.002 AU cm⁻¹	1-4
Transmittance at 254 nm	Calculation from Absorbance at the specified wavelength.	0.5 %T, 1 cm cell	1-4
Escherichia coli	MPN count using Colilert, Incubated at 35°C for 24 hours. APHA 9223 B 23rd ed. 2017.	1 MPN / 100mL	1-4

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Dates of testing are available on request. Please contact the laboratory for more information.

Samples are held at the laboratory after reporting for a length of time based on the stability of the samples and analytes being tested (considering any preservation used), and the storage space available. Once the storage period is completed, the samples are discarded unless otherwise agreed with the customer. Extended storage times may incur additional charges.

This certificate of analysis must not be reproduced, except in full, without the written consent of the signatory.

Ara Heron BSc (Tech)
Client Services Manager - Environmental

Wet Weather Storm Drain Samples

Hill Laboratories
TRIED, TESTED AND TRUSTED

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Certificate of Analysis

Client:	Tonkin & Taylor	Lab No:	2335686
Contact:	Wageed Kamish	Date Received:	05-Mar-2020
	C/- Tonkin & Taylor	Date Reported:	12-Mar-2020
	PO Box 5271	Quote No:	102973
	Auckland 1141	Order No:	Wageed Kamish
		Client Reference:	
		Submitted By:	Wageed Kamish

Sample Type: Aqueous

Sample Name:		Low06 04-Mar-2020 10:40 am	Low08 04-Mar-2020 10:20 am	Low18 04-Mar-2020 11:05 am	Low03A 04-Mar-2020 11:25 am	
Lab Number:		2335686.1	2335686.2	2335686.3	2335686.4	
Individual Tests						
Turbidity	NTU	78	99	144	97	-
Total Suspended Solids	g/m³	62	30	132	90	-
Total Nitrogen	g/m³	2.1	5.0	2.1	1.58	-
Total Ammoniacal-N	g/m³	0.045	1.17	0.167	0.169	-
Nitrite-N	g/m³	0.052	0.072	0.044	0.035	-
Nitrate-N	g/m³	0.86	0.62	0.67	0.33	-
Nitrate-N + Nitrite-N	g/m³	0.92	0.69	0.71	0.37	-
Total Kjeldahl Nitrogen (TKN)	g/m³	1.20	4.3	1.43	1.21	-
Total Phosphorus	g/m³	0.60	1.96	1.24	0.32	-
Absorbance at 254 nm	AU cm⁻¹	0.479	0.633	0.350	0.298	-
Transmittance at 254 nm	%T, 1 cm cell	33.2	23.3	44.7	50.4	-
Escherichia coli	MPN / 100mL	2,480 [4]	213 [4]	7,270	4,610 [4]	-
Heavy metals, dissolved, trace As,Cd,Cr,Cu,Ni,Pb,Zn						
Dissolved Arsenic	g/m³	0.0024	0.0017	0.0030	0.0048	-
Dissolved Cadmium	g/m³	0.00014	0.00009	< 0.00005	< 0.00005	-
Dissolved Chromium	g/m³	0.0017	0.0016	0.0018	0.0039	-
Dissolved Copper	g/m³	0.0142	0.027	0.0109	0.0130	-
Dissolved Lead	g/m³	0.00099	0.00110	0.00036	0.00039	-
Dissolved Nickel	g/m³	0.0013	0.0082 [4]	0.0008	0.0007	-
Dissolved Zinc	g/m³	0.52	1.27	0.21	0.162	-
Heavy metals, totals, trace As,Cd,Cr,Cu,Ni,Pb,Zn						
Total Arsenic	g/m³	0.0033	0.0021	0.0055	0.0068	-
Total Cadmium	g/m³	0.00027	0.000109	0.000137	0.000062	-
Total Chromium	g/m³	0.0061	0.0053	0.0113	0.0106	-
Total Copper	g/m³	0.024	0.037	0.041	0.041	-
Total Lead	g/m³	0.0156	0.0074	0.020	0.0104	-
Total Nickel	g/m³	0.0027	0.0081 [4]	0.0038	0.0028	-
Total Zinc	g/m³	0.67	1.41	0.51	0.36	-
Organochlorine Pesticides Screening in Water, By Liq/Liq						
Aldrin	g/m³	< 0.00010	< 0.00010	< 0.00010	< 0.00010	-
alpha-BHC	g/m³	< 0.0002	< 0.0002	< 0.0002	< 0.0002	-
beta-BHC	g/m³	< 0.0002	< 0.0002	< 0.0002	< 0.0002	-
delta-BHC	g/m³	< 0.0002	< 0.0002	< 0.0002	< 0.0002	-
gamma-BHC (Lindane)	g/m³	< 0.0002	< 0.0002	< 0.0002	< 0.0002	-
cis-Chlordane	g/m³	< 0.00010	< 0.00010	< 0.00010	< 0.00010	-
trans-Chlordane	g/m³	< 0.00010	< 0.00010	< 0.00010	< 0.00010	-
2,4'-DDD	g/m³	< 0.0002	< 0.0002	< 0.0002	< 0.0002	-

Wet Weather Storm Drain Samples, cont.

Sample Type: Aqueous						
Sample Name:		Low06 04-Mar-2020 10:40 am	Low08 04-Mar-2020 10:20 am	Low18 04-Mar-2020 11:05 am	Low03A 04-Mar-2020 11:25 am	
Lab Number:		2335686.1	2335686.2	2335686.3	2335686.4	
Organochlorine Pesticides Screening in Water, By Liq/Liq						
4,4'-DDD	g/m³	< 0.0002	< 0.0002	< 0.0002	< 0.0002	-
2,4'-DDE	g/m³	< 0.0002	< 0.0002	< 0.0002	< 0.0002	-
4,4'-DDE	g/m³	< 0.0002	< 0.0002	< 0.0002	< 0.0002	-
2,4'-DDT	g/m³	< 0.0002	< 0.0002	< 0.0002	< 0.0002	-
4,4'-DDT	g/m³	< 0.0002	< 0.0002	< 0.0002	< 0.0002	-
Dieldrin	g/m³	< 0.00010	< 0.00010	< 0.00010	< 0.00010	-
Endosulfan I	g/m³	< 0.0002	< 0.0002	< 0.0002	< 0.0002	-
Endosulfan II	g/m³	< 0.0002	< 0.0002	< 0.0002	< 0.0002	-
Endosulfan sulfate	g/m³	< 0.0002	< 0.0002	< 0.0002	< 0.0002	-
Endrin	g/m³	< 0.00010	< 0.00010	< 0.00010	< 0.00010	-
Endrin aldehyde	g/m³	< 0.00010	< 0.00010	< 0.00010	< 0.00010	-
Endrin ketone	g/m³	< 0.0002	< 0.0002	< 0.0002	< 0.0002	-
Heptachlor	g/m³	< 0.00010	< 0.00010	< 0.00010	< 0.00010	-
Heptachlor epoxide	g/m³	< 0.00010	< 0.00010	< 0.00010	< 0.00010	-
Hexachlorobenzene	g/m³	< 0.0008	< 0.0008	< 0.0008	< 0.0008	-
Methoxychlor	g/m³	< 0.00010	< 0.00010	< 0.00010	< 0.00010	-
Total Chlordane [(cis+trans)*100/42]	g/m³	< 0.0004	< 0.0004	< 0.0004	< 0.0004	-
Polycyclic Aromatic Hydrocarbons Screening in Water, By Liq/Liq						
Acenaphthene	g/m³	< 0.00010	< 0.00010	< 0.00010	< 0.00010	-
Acenaphthylene	g/m³	< 0.00010	< 0.00010	< 0.00010	< 0.00010	-
Anthracene	g/m³	< 0.00010	< 0.00010	< 0.00010	< 0.00010	-
Benzo[a]anthracene	g/m³	< 0.00010	< 0.00010	< 0.00010	< 0.00010	-
Benzo[a]pyrene (BAP)	g/m³	< 0.00010	< 0.00010	< 0.00010	< 0.00010	-
Benzo[b]fluoranthene + Benzo[j] fluoranthene	g/m³	< 0.00010	< 0.00010	< 0.00010	< 0.00010	-
Benzo[g,h,i]perylene	g/m³	< 0.00010	< 0.00010	< 0.00010	< 0.00010	-
Benzo[k]fluoranthene	g/m³	< 0.00010	< 0.00010	< 0.00010	< 0.00010	-
Chrysene	g/m³	< 0.00010	< 0.00010	< 0.00010	< 0.00010	-
Dibenzo[a,h]anthracene	g/m³	< 0.00010	< 0.00010	< 0.00010	< 0.00010	-
Fluoranthene	g/m³	< 0.00010	< 0.00010	< 0.00010	< 0.00010	-
Fluorene	g/m³	< 0.0002	< 0.0002	< 0.0002	< 0.0002	-
Indeno(1,2,3-c,d)pyrene	g/m³	< 0.00010	< 0.00010	< 0.00010	< 0.00010	-
Naphthalene	g/m³	< 0.0005	< 0.0005	< 0.0005	< 0.0005	-
Phenanthrene	g/m³	< 0.0004	< 0.0004	< 0.0004	< 0.0004	-
Pyrene	g/m³	0.0003	< 0.0002	< 0.0002	< 0.0002	-

Analyst's Comments

[#1] It has been noted that the result for the dissolved fraction was greater than that for the total fraction, but within analytical variation of the methods.

[#2] Please interpret this microbiological result with caution as the sample was > 24 hours old at the time of testing in the laboratory. The sample is required to reach the laboratory with sufficient time to allow testing to commence within 24 hours of sampling.

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request. Unless otherwise indicated, analyses were performed at Hill Laboratories, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Aqueous			
Test	Method Description	Default Detection Limit	Sample No
Filtration to obtain filter for ESR microbial source tracking*	Sterile filtration of water sample. Filter paper stored frozen in GITC Buffer, pending possible future microbial source tracking analysis.	-	1-4
Heavy metals, dissolved, trace As,Cd,Cr,Cu,Ni,Pb,Zn	0.45µm Filtration, ICP-MS, trace level. APHA 3125 B 23rd ed. 2017.	0.00005 - 0.0010 g/m³	1-4
Heavy metals, totals, trace As,Cd,Cr,Cu,Ni,Pb,Zn	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 23rd ed. 2017 / US EPA 200.8.	0.000053 - 0.0011 g/m³	1-4

Wet Weather Storm Drain Samples, cont.

Sample Type: Aqueous			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Organochlorine Pesticides Screening in Water, By Liq/Liq	Liquid / liquid extraction, SPE (if required), dual column GC-ECD analysis.	0.00010 - 0.0008 g/m³	1-4
Polycyclic Aromatic Hydrocarbons Screening in Water, By Liq/Liq	Liquid / liquid extraction, SPE (if required), GC-MS SIM analysis [KBIs:4736,2696].	0.00010 - 0.0005 g/m³	1-4
Filtration, Glass Fibre	Sample filtration through glass fibre filter.	-	1-4
Filtration, Unpreserved	Sample filtration through 0.45µm membrane filter.	-	1-4
Total Digestion	Nitric acid digestion. APHA 3030 E (modified) 23rd ed. 2017.	-	1-4
Turbidity	Analysis using a Hach 2100N, Turbidity meter. APHA 2130 B 23rd ed. 2017 (modified).	0.05 NTU	1-4
Total Suspended Solids	Filtration using Whatman 934 AH, Advantec GC-50 or equivalent filters (nominal pore size 1.2 - 1.5µm), gravimetric determination. APHA 2540 D (modified) 23rd ed. 2017.	3 g/m³	1-4
Filtration for dissolved metals analysis	Sample filtration through 0.45µm membrane filter and preservation with nitric acid. APHA 3030 B 23rd ed. 2017.	-	1-4
Total Nitrogen	Calculation: TKN + Nitrate-N + Nitrite-N. Please note: The Default Detection Limit of 0.05 g/m³ is only attainable when the TKN has been determined using a trace method utilising duplicate analyses. In cases where the Detection Limit for TKN is 0.10 g/m³, the Default Detection Limit for Total Nitrogen will be 0.11 g/m³.	0.05 g/m³	1-4
Total Ammoniacal-N	Phenol/hypochlorite colourimetry. Flow injection analyser. (NH_4-N = NH_4^+-N + NH_3-N). APHA 4500-NH_3 H (modified) 23rd ed. 2017.	0.010 g/m³	1-4
Nitrite-N	Automated Azo dye colorimetry. Flow injection analyser. APHA 4500-NO_2 I (modified) 23rd ed. 2017.	0.002 g/m³	1-4
Nitrate-N	Calculation: (Nitrate-N + Nitrite-N) - NO2N. In-House.	0.0010 g/m³	1-4
Nitrate-N + Nitrite-N	Total oxidised nitrogen. Automated cadmium reduction, flow injection analyser. APHA 4500-NOx I (modified) 23rd ed. 2017.	0.002 g/m³	1-4
Total Kjeldahl Nitrogen (TKN)	Total Kjeldahl digestion, phenol/hypochlorite colorimetry. Discrete Analyser. APHA 4500-N_{org} D (modified) 4500 NH_3 F (modified) 23rd ed. 2017.	0.10 g/m³	1-4
Total Phosphorus	Total phosphorus digestion, ascorbic acid colorimetry. Discrete Analyser. APHA 4500-P B & E (modified from manual analysis and also modified to include a reductant to reduce interference from any arsenic present in the sample) 23rd ed. 2017. NWASCO, Water & soil Miscellaneous Publication No. 38, 1982.	0.004 g/m³	1-4
Absorbance at 254 nm	Filtered sample. Spectrophotometry, 1cm cell. APHA 5910 B 23rd ed. 2017.	0.002 AU cm⁻¹	1-4
Transmittance at 254 nm*	Calculation from Absorbance at the specified wavelength.	0.5 %T, 1 cm cell	1-4
Escherichia coli	MPN count using Colilert (incubated at 35°C for 24 hours), or Colilert 18 (incubated at 35°C for 18 hours). APHA 9223 B 23rd ed. 2017.	1 MPN / 100mL	1-4

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Dates of testing are available on request. Please contact the laboratory for more information.

Samples are held at the laboratory after reporting for a length of time based on the stability of the samples and analytes being tested (considering any preservation used), and the storage space available. Once the storage period is completed, the samples are discarded unless otherwise agreed with the customer. Extended storage times may incur additional charges.

Ara Heron BSc (Tech)
Client Services Manager - Environmental

E. coli Faecal Source Tracking Results (by qPCR analysis)

ESR
Science for Communities

27 March 2020

To: Wageed Kamishr
Tonkin & Taylor
PO Box 5271
AUCKLAND 1141

Email: WKamish@tonkintaylor.co.nz

From: ESR Christchurch Science Centre
PO Box 29181
CHRISTCHURCH 8540

Email: faecalsource@esr.cri.nz

REPORT ON FAECAL SOURCE TRACKING ANALYSIS

The following samples were received on 17th March 2020 and were analysed for faecal source PCR markers. The samples had been prefiltered and stored by Hill Laboratories.

ESR Number	Sample Reference	Date Sampled
CMB200283	LOW18	4-3-2020 11:05
CMB200284	LOW03A	4-3-2020 11:25
CMB200285	LOW06	4-3-2020 10:40

E. coli Faecal Source Tracking Results (by qPCR analysis)

Results of faecal source PCR Marker Analysis:

Please refer to the appendix for guidance on interpretation of these results

ESR Number	Description / Site ID	Sampled	General GenBac / 100 ml	Human BacH / 100 ml	Human BiADO / 100 ml	Ruminant BacR / 100 ml	Proportion Ruminant	Avian GFD / 100 ml	Conclusions:
CMB200283	LOW16	4-3-2020 11:05	69,000	<33	<43	4,200	10-50%	<29	Faecal source – ruminant (10-50%)
CMB200284	LOW03A	4-3-2020 11:25	93,000	<17	<21	6,800	50-100%	<14	Faecal source – ruminant (50-100%)
CMB200285	LOW06	4-3-2020 10:40	250,000	<33	<43	3,500	1-10%	<29	Faecal source – ruminant (1-10%)

Abbreviations: NA = sample was not analysed for this marker.
NC = not calculated
LOQ = limit of quantitation

Notes:
Brief details of the methods of analysis are available on request.
These results relate to samples as received.
This report may not be reproduced except in full.

Paula Scholes
Laboratory Operations Technical Lead

Beth Robson
Principal Technician

Attachment 1

E. coli Faecal Source Tracking Results (by qPCR analysis)

APPENDIX: Assay Interpretation Guidance Notes

PCR Marker interpretation notes

- Each marker is strongly associated with, but not exclusive to the source tested for. They each have some degree of non-specificity.
- Each marker is a separate test and the levels of the various markers within the same sample cannot be compared. For example, if sample A has a BacH result of 1,000 and a BacR of 100 it is not valid to say there is more human contamination than ruminant in sample A.
- Levels of the same marker in different samples can be compared. For example;
    - If sample A has a BacH result of 1,000 and sample B has a BacH of 10,000 it is valid to conclude there is more human faecal contamination in sample B than in sample A; or
    - If site H sampled in January has a GFD result of 500 and when sampled in February has a GFD result of 10,000, it is valid to conclude the level of avian faecal contamination in February is greater.
    - To be classified as a significantly greater or lesser result the level of marker should vary by a factor of 10.
- Both Human markers are required to be present for a positive human result.
- Ruminant specific markers are reported using a percentage value based on levels of this marker relative to the general marker in fresh ruminant faeces.
    - Samples reported as 50-100% ruminant are consistent with all of the general faecal marker having come from a ruminant source.
    - The lower levels reported (10-50%) may be a consequence of the presence of other sources of pollution, or in fact ruminant sources may still account for all the pollution, but this may include aged faecal material where relative levels of the ruminant marker decline more rapidly than the general marker.
    - Levels less than 10% ruminant suggest a very minor contribution from ruminant sources.

The detection limits of these methods vary depending on the volume of water filtered for analysis. We recommend a minimum volume of 200 mls and a maximum of 1000 mls, this range gives the following detection limits:

mls sample filtered	General GenBac / 100 mls	Human BacH / 100 mls	Human BiADO / 100 mls	Human HumM3 / 100 mls	Ruminant BacR / 100 mls	Ruminant Sheep / 100 mls	Ruminant Cow / 100 mls
< 400 mls	<110	<83	<110	<8	<91	<100	<11
400-700mls	<42	<33	<43	<3	<36	<41	<5
700-1000mls	<21	<17	<21	<2	<18	<21	<2

mls sample filtered	Dog DogBac / 100 mls	Avian GFD / 100 mls	Avian E2 / 100 mls	Gull- 2
> 400 mls	<79	<72	<99	presence / absence test
400-700mls	<31	<29	<40	
700-1000mls	<16	<14	<20	

Appendix B: Memo

Tonkin+Taylor

Memo

To:	**Wageed Kamish**	**Job No:**	**1007392**
From:	**John Hansford**	**Date:**	**24 March 2020**
Subject:	**Simulated runoff from Industrial areas into pond near Chatham and Omahu roads**		

1 Introduction

Runoff from the adjacent industrial area drains into Lowes Pit. The location of the pit and estimated catchments draining to the pit are shown in Figure 1.1.

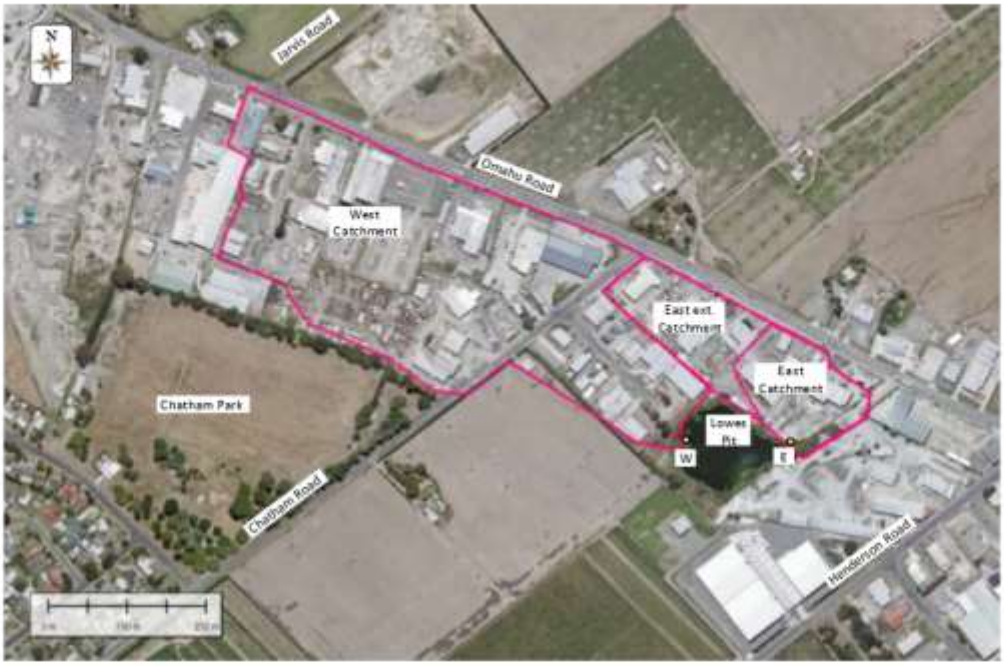

Figure 1.1: Location of Lowes Pit and catchments draining into the pit

An hydrological assessment was carried out, using HEC-HMS, to estimate flood hydrographs flowing from the West and East catchments into the pit. The areas draining into the pit are all industrial developments and flow paths are not readily defined. In particular, analyses were carried out based on two alternative East catchment areas because of uncertainty about the extent of the East Catchment that drains into the pit at point E.

2 Catchment characteristics

The catchments were delineated using the overland drainage path coverage and developments shown in the aerial photographs from "World Imagery" and LiDAR data. There is some uncertainty

about the area draining to Point E, so analyses were carried out for both the local and extended East catchments.

The Landcare Research permeability map classifies the catchments as "Rapid" draining, which was confirmed by T+T hydrogeologists with experience in the area.

The SCS CN (NRCS, 1986) for the catchments were estimated as 81 based on industrial land use and rapid draining soils SCS Group A. A CN of 88, based on Group B soils, also was used in simulations to assess sensitivity. Initial loss (Ia) was calculated in accordance with SCS guideline as 20% of soil storage.

Catchment characteristics are summarised in Table 2.1.

Table 2.1: Catchment characteristics

Characteristic	Catchment		
	West	East	East plus East Ext.
Catchment area (ha)	13.1	1.7	3.5
Longest water course (m)	930	150	300
SCS CN 81			
Initial abstraction (mm)	12	12	12
Time of concentration (hours)	1.1	0.3	0.4
Catchment lag (minutes)	44	11	17
SCS CN 88			
Initial abstraction (mm)	7	7	7
Time of concentration (hours)	1.0	0.3	0.4
Catchment lag (minutes)	40	10	16

3 Storm rainfall

Storm rainfall for the catchments were downloaded from NIWA's HIRDS version 4 database. These data are listed in Table 3.1.

Table 3.1: Summary of HIRDS version 4 storm depths for the catchments

ARI (years)	Storm depth (mm) for duration (hours)						
	1	2	3	6	12	24	48
2	15	21	26	36	48	62	79
5	21	29	35	48	63	82	104
10	25	35	42	57	75	97	122
20	30	42	50	67	88	112	140
50	37	51	61	81	105	133	165
100	43	58	69	92	119	150	184

Simulations were carried out using the 2 year and 5 year ARI storm rainfall input to HEC-HMS as specified hyetographs calculated using the temporal distributions for East of North Island in the HIRDS version 4 documentation.

4 Simulated hydrographs

Runoff from the catchments was simulated using the SCS Unit Hydrograph with SCS CN loss function. Simulations were carried out for 2 year and 5 year ARI storms with durations of 1, 6, 12 and 24 hours with CN of 81 and 88 and Ia 20% of soil storage. Design storm rainfall was input using HIRDS version 4 temporal distributions. The results for CN 81 and CN 88 are summarised in Table 4.1 and Table 4.2 respectively. The peak discharge for a 1 hour storm calculated with CN 81 is approximately an order of magnitude lower than calculated with CN 88. This is because Ia reduces by 40% as CN increases from 81 to 88 (i.e. from 12 to 7 mm) and the total 1 hour storm rainfall depth is only 15 mm leaving 3 mm to runoff for CN 81 and 5 mm for CN 88.

Table 4.1: Simulated peak discharge from the catchments (CN 81) (HIRDS temporal distributions)

Catchment	CN 81: Peak discharge (L/s) for storm duration (hours)				
	1 hour	6 hour	12 hour	24 hour	48 hour
2 year ARI					
West	5.9	100.2	107.6	98.8	84.0
East	2.2	14.6	14.5	13.0	11.1
East plus East Ext.	3.5	29.6	29.5	26.6	22.6
5 year ARI					
West	40.8	192.6	182.9	154.9	127.0
East	12.9	27.8	24.5	20.5	16.6
East 2	22.0	56.4	50.0	41.8	34.0

Table 4.2: Simulated peak discharge from the catchments (CN 88) (HIRDS temporal distributions)

Catchment	CN 88: Peak discharge (L/s) for storm duration (hours)				
	1 hour	6 hour	12 hour	24 hour	48 hour
2 year ARI					
West	59.6	182.6	163.8	134.6	109.3
East	16.8	25.9	21.7	17.7	14.2
East plus East Ext.	29.2	52.4	44.2	36.2	29.1
5 year ARI					
West	148.8	301.6	251.1	196.6	155.0
East	39.9	42.7	33.4	25.8	20.2
East 2	70.0	86.4	68.0	52.7	41.4

The 2 year 2 hour peak discharge is required input in infrastructure design. HIRDS does not provide temporal distributions for storm durations between 1 hour and 6 hours. Prior to the HIRDS temporal distributions T+T favoured nested hyetographs with peak rainfall intensity limited to between 3 and 5 times the average storm intensity. Simulations were carried out using limited peak intensity hyetographs for storm durations of 1, 2, 3, 6, 12, 24 and 48 hours for both CN 81 and CN 88. These results are summarised in Table 4.3 and Table 4.4.

Table 4.3: Simulated peak discharge from the catchments (CN 81) (Limited peak intensity hyetographs)

Catchment	CN 81: Peak discharge (L/s) for storm duration (hours)						
	1 hour	2 hour	3 hour	6 hour	12 hour	24 hour	48 hour
2 year ARI							
Catchment 1	5.9	36.8	55.3	96.6	138.7	157.9	138.2
Catchment 2	3.5	12.8	18.0	36.3	43.6	45.3	37.7
Catchment 3	2.2	6.3	10.2	19.5	22.0	22.5	18.4
5 year ARI							
West	40.2	103.6	136.5	208.2	253.1	262.4	212.4
East	11.1	21.2	32.0	39.9	38.5	36.5	28.1
East 2	20.2	37.6	54.9	76.0	77.0	74.0	57.4

Table 4.4: Simulated peak discharge from the catchments (CN 88) (Limited peak intensity hyetographs)

Catchment	CN 88: Peak discharge (L/s) for storm duration (hours)						
	1 hour	2 hour	3 hour	6 hour	12 hour	24 hour	48 hour
2 year ARI							
Catchment 1	58.4	116.8	148.8	208.2	228.6	223.7	174.6
Catchment 2	26.4	45.2	61.1	71.2	66.7	61.7	46.8
Catchment 3	14.8	25.9	35.5	36.8	33.1	30.3	22.8
5 year ARI							
West	146.3	241.0	294.3	365.6	365.0	338.4	251.3
East	37.7	60.2	72.6	62.2	51.7	45.3	32.7
East 2	65.8	101.2	124.7	121.8	104.5	92.4	67.0

The temporal distribution of storm rainfall affects the simulated peak discharge and also the storm duration resulting in the simulated peak. The 1 hour hydrograph peaks simulated using HIRDS hyetographs are similar to those using limited peak intensity hyetographs. However, the 6 hour peak discharges generated using limited peak intensity hyetographs are larger than generated using HIRDS hyetographs. Taking this into consideration, the 2 hour hydrograph peaks are considered conservative estimates (high) and suitable for design purposes.

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Appendix C: Detailed Assessment of Vertical Flow Wetlands Option

Appendix 3 – Detailed Assessment of Vertical Flow Wetlands Option

Vertical Flow Wetlands

VFWs operate differently to surface flow wetlands. Water is applied evenly over a fully lined sand and gravel filter media pit or bed and the drainage is percolated down through the filter media (Figure). In this case the treated water will mix with the groundwater after percolation. The filter media needs to remain well aerated at all times and this is most effectively achieved by the addition of perforated aeration pipes that draw air down into the bed and by the establishment of wetland plants over the wetland surface. The plant roots grow down into the substrate and provide a pathway for air to descend down into the wetland base.

The mechanisms for removal of water quality contaminants are illustrated in Figure , which shows that a biofilm with dense microbial flora will form along the plant roots as well as around the wetland substrate (sand, gravel, etc.) used.

The bacterial biofilm typically contains the following bacteria:

1 Heterotrophic bacteria that use organic material as a carbon source, thereby reducing the $cBOD_5$/COD content of the water.

2 Autotrophic bacteria that use CO_2 as a carbon source and are responsible for NH_4-N conversion to nitrates and nitrites.

The above mentioned bacteria groups both need an oxygenated environment to perform their functions.

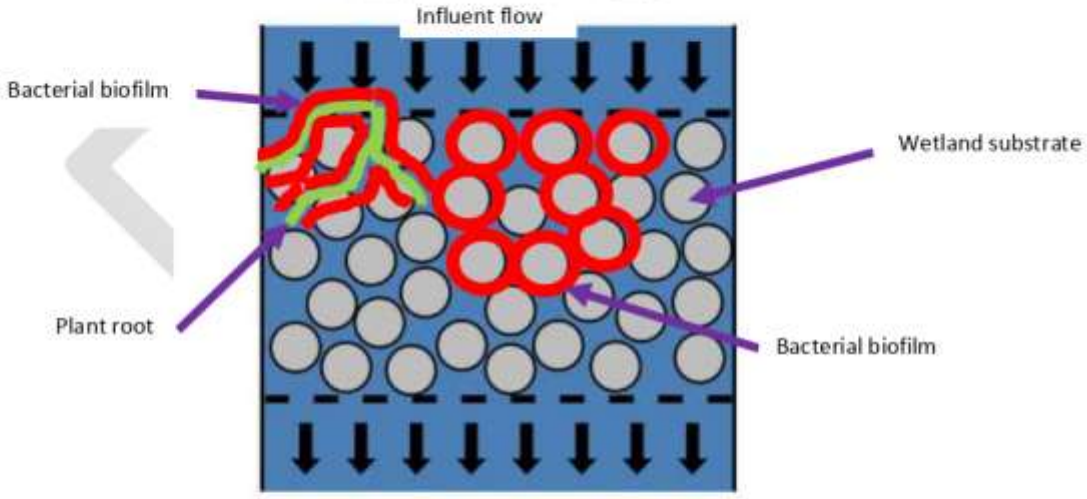

Figure 1: Schematic section through a VFCW showing

Particulate material (organic or inorganic) will be entrapped in the media aggregate, with the particulate organic material eventually decaying.

It is worth noting that the microbial flora in the biofilm will require some time to increase to its optimum concentration for the wetland to perform effectively.

VFW that receive constant discharge flows without regular periods of no flow may struggle to retain sufficient aeration to sustain the nitrifying bacteria in the substrate. Where this is a risk it is recommended that two or more parallel bays are constructed with the discharge applied in pulses to one bay at a time. The duration of the alternating application and rest periods will depend on the permeability of the VFW filter media used but application periods of 4 to 6 hours followed by dry periods of equal duration are likely to be necessary.

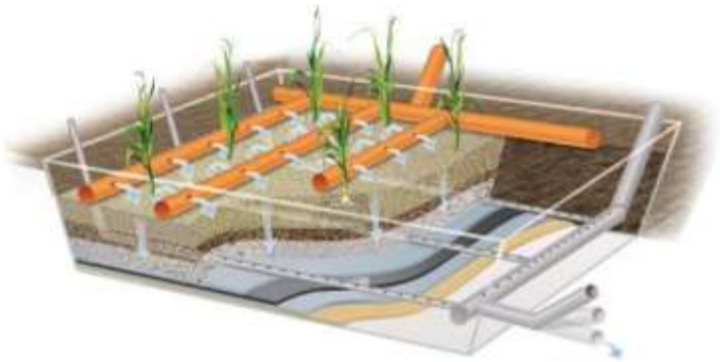

Figure 2: Diagrammatic representation of a vertical flow wetland

VFW can be very effective at extracting faecal pathogens, suspended solids and phosphorus bound to solids. The VFW substrate serves as an effective filter for faecal bacteria as all discharge must pass down to the wetland base before it can leave the system. Solids are trapped in a similar way, however, it is recommended that additional, upstream devices (such as sediment retention ponds) are constructed if suspended solid concentrations are high. High concentrations of solids will quickly clog a VFW, reducing performance and requiring regular maintenance.

The process flow diagram for a VFW system is shown in Figure . The old Humesceptors could be repurposed to act as a settlement tank with pumping from here to the VFW.

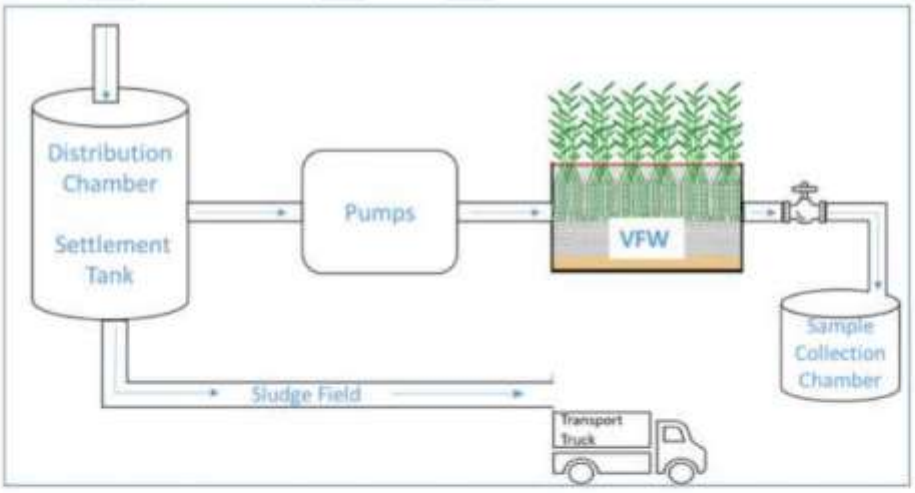

Figure 3: Schematic process flow diagram for a VFW system

Background on vertical flow constructed wetlands

There are three mechanisms for removal of contaminants in VFWs, namely physical, chemical and biological. The processes associated with contaminant removal are summarised in Table below (Alexandros *et al.*, 2014).

Initiation of the biological process of nitrification - the breakdown of ammonium to nitrate – and the creation of optimal conditions for the proliferation of nitrifying bacteria are critical requirements for the operation of an effective VFW. A well-oxygenated substrate is the primary objective. Particle size and periodic maintenance to prevent clogging from suspended solids are key contributing factors to how well aerated the wetland will be. It is our recommendation that laboratory trials are undertaken before final design and construction, using locally available substrates, to determine likely percolation rates and the retention of suitably aerated conditions.

Table 1: Processes associated with contaminant removal in VFWs (Alexandros et al., 2014)

Pollutant	Transformation process		
	Physical	Chemical	Biological
Organic matter removal (as $cBOD_5$ and COD)	Filtration and settling (Particulates)[a]	Oxidation	Bacterial degradation (soluble)[a] Microbial consumption[a]
Nitrogen	Volatilization	Ion exchange	Nitrification[a]/denitrification, microbial consumption[a]/plant uptake
TSS	Filtration[a]/Sedimentation[a]		Bacterial decomposition[a]
Pathogens	Filtration[a]	UV degradation, adsorption	predation[a], natural die-off[a]
Phosphorous	Filtration[a]	adsorption[a], precipitation	plant uptake, microbial consumption
Heavy metals	Settling	Adsorption[a], precipitation[a]	Biodegradation, phyto-degradation, phyto-volatilization, plant uptake

[a] indicates processes that are intense in VFWs

VFW dimensions

The wetland system has been designed to allow the maximum discharge volume to pass through it without causing flooding or overtopping of the VFW the wetland bay has been designed to allow a peak flows of 20,250 m^3 per day to pass through it.

The VFW will consist of a single bay with a surface area of 8,100 m^2 and a volume of 10,125 m^3 (depth of 1.25 m) to allow the projected peak flow of 20,250 m^3/day to pass through it. This has been calculated assuming three layers of filter media, with a layer of fine sand on the surface, a medium grade sand layer in the middle of the profile and coarse stone at the bottom covering the collection pipes leading to the sampling bay (Figure).

The flow rate through the wetland was calculated using Darcy's equation[1] applied to particle sizes as stated in Table below. Fine and medium sand were considered as filter media and the characteristics of these materials as well as the calculated flow rates are listed below. The calculated flows are indicative of flow rates that could be accommodated by the VFW.

Excessive flows may eventuate in heavy rain events or if the VFW filter media becomes clogged for any reason and percolation rates are reduced. In these cases the pit could overtop resulting in flooding around the Hazelwood Street area.

Table 2: Estimated volumetric flow rates though various filter media proposed for VFW

Material	Particle size (mm)	Hydraulic conductivity (m/day)	Depth of medium in filter bed (m)	Porosity	Flow rate through bed (water level equal to level of fine sand layer) m^3/day
Coarse gravel	16-32	150	0.25	0.28	1,215,000
Coarse sand	0.5-1.0	45	0.70	0.39	364,500
Fine sand	0.125-0.25	2.5	0.3	0.43	20,250

The flow rate through the fine sand layer would control the overall drainage rate through the system.

Although the volumetric flow rate through the fine sand, under minimum driving head, can filter a significant volume of flow per day, this would have to be confirmed with drainage tests using on-site material. It should also be noted that clogging over time would reduce the flowrate through the fine sand, which could result in flooding if the pit levels are overtopped.

At this stage the effect of direct rainfall has not been taken into account.

Potential VFW performance

While information to guide the effective construction and performance of SFWs in NZ can be drawn from data collected from many existing constructed wetlands, little field performance data exists for VFWs because few have been built under NZ conditions. Because of this we recommend that some mathematical modelling and laboratory tests be undertaken to confirm the performance of the wetland should it be put forward as the preferred option.

[1] Darcy's Law is used to calculate flow through sand columns using the driving head, depth of bed, hydraulic conductivity of the material and the cross-sectional area

1

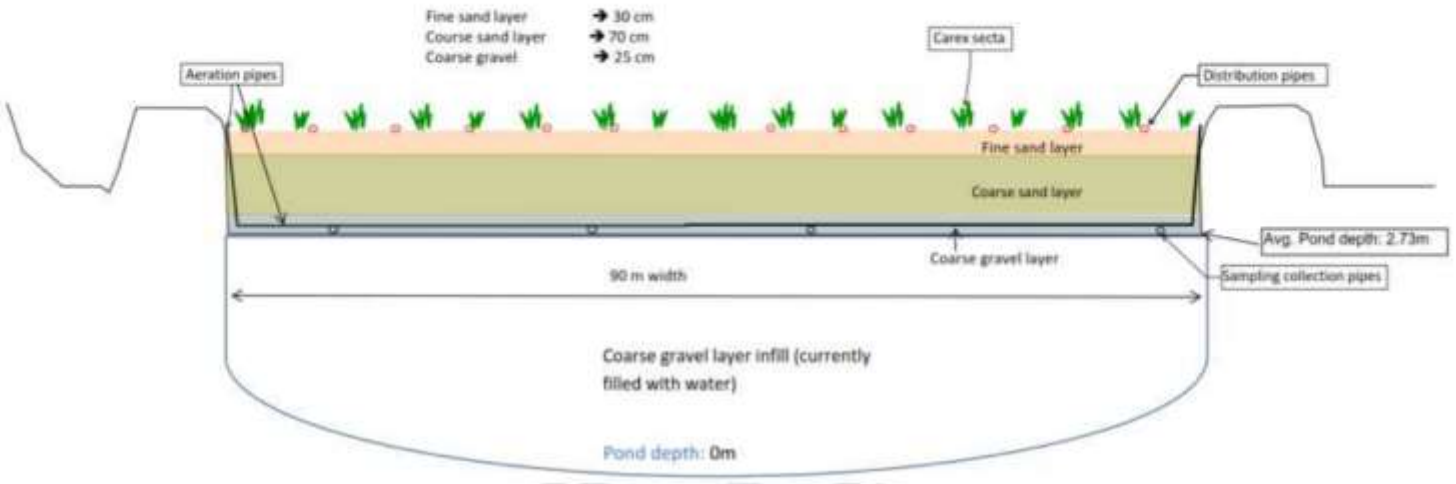

Figure 4: Indicative cross section of a vertical flow wetland in Lowes Pit. Coarse gravel media will fill the pit up to the winter ground water level with VFW media on top of that coarse gravel

Proposed layout and design of the VFW

Stormwater will be pumped from the settlement tank (repurposed Humesceptor) and delivered to the head of the wetland by pipe. At present there is not sufficient information available to size this pumpstation, but an indicative cost was obtained from a previous studyfor the preliminary design of a VFW (T+T, 2019a). The VFW will not be lined and treated stormwater will drain to groundwater. At this stage it is unclear by how much the groundwater level would increase during winter and for costing purposes this has been assumed at 1 m above the summer groundwater level. According to HBRC (2015), however, this increase could be as much as 2 m, which would likely reduce the efficiency of the VFW due to partial saturation by groundwater.

Aeration pipes will connect to the drainage collection pipe network and as the collected effluent drains downslope a siphon is created, sucking fresh air through the aeration pipes from the atmosphere, resulting in effective aeration of the VFW bed.

A portion of the treated flow will be routed to a sampling well where treated effluent samples can be collected for analyses and used in performance assessment. A schematic pipe layout for the VFW is shown in Figure .

1

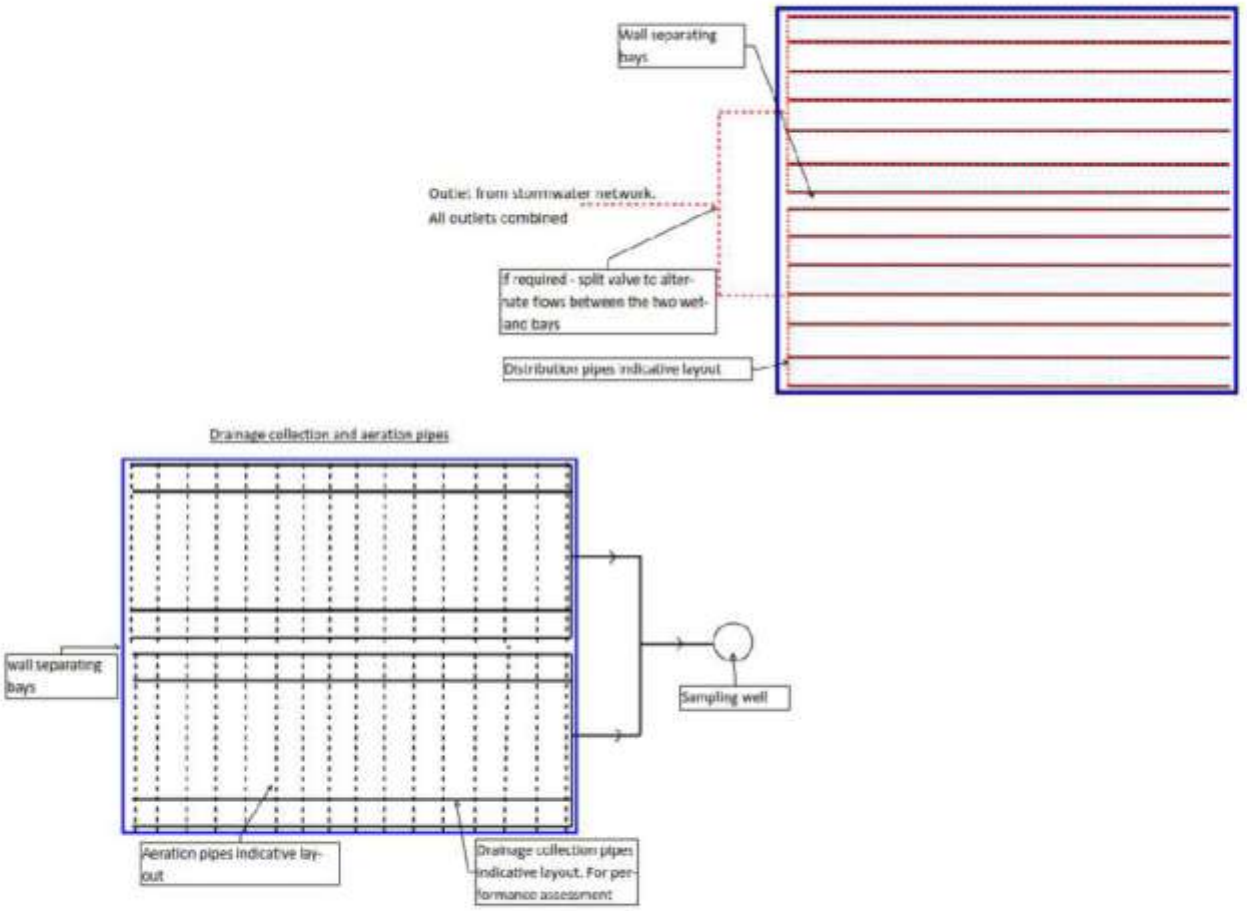

Figure 5: Indicative layout of the distribution, collection and aeration pipes in a VFW

Plants

Plants are less important to the functioning of a VFW than they are for an SFW where the provision of a constant supply of organic material is required. However, the root systems of plants do promote more effective aeration down into the filter media in VFWs and they also provide sites for the establishment of biofilms, so the establishment of native sedges and rushes on the surface of the VFW is recommended. Plants also improve the visual appearance of the wetland and help prevent weed invasion.

Site and laboratory investigations to confirm VFW design

As discussed above, the performance of VFW systems depends on the flow rate through the filter media and the establishment and retention of a healthy population of bacteria. To ensure that optimum conditions can be created using local filter media it is recommended that controlled laboratory trials are undertaken before final design and construction to test flow rates. The winter groundwater level should also be determined to inform the design of the VFW.

It is also proposed that the VFW should be monitored for at least the first 5 years following construction to determine how well it is performing, and to help determine the maintenance regime required and any changes that may need to be made to the filter media and aeration system.

Rough order cost estimate

The following indicative rough order costs have been prepared for the preliminary design. The costs are presented in Table , and include a base cost with an upper range of base cost + 50% to account for the level uncertainty at this stage in the design.

Table 3: Rough order cost estimate

Description	Rough order cost (ex GST)	
	Base cost ($)	Upper cost ($)
Preliminary and General (20% of physical works)	380,000	570,000
Professional fees (15% of physical works)	345,000	517,500
Contingency (10% of physical works)	230,000	345,000
Vertical flow wetland[1]		
• Synthetic impermeable HDPE liner including geotextile top layer.	Not required	
• Wetland substrate and replacement costs. Including 300 mm fine sand layer, 700 mm coarse sand layer, 250 mm coarse gravel layer and infill of pit to winter groundwater level.	1,600,000	
• Pipe delivery, application, aeration and collection system. Including 110 mm diameter punched PVC pipe at 5 m centres.	90,000	
• Spillway/overflow structure to surface flow wetland. Including concrete beam weir and 70 m riprap lined overflow channel.	Not required	
• Outflow pipe to surface flow wetland. Including grade SN16 225 mm diameter pipe.	Not required	
• Planting (includes plant purchase, planting and one year of maintenance)	76,000	
Vertical flow wetland sub total	**1,766,000**	**2,649,000**
Pump station[2]		

• Supply and install wet well, access covers and interconnecting pipework to existing Humesceptor (settlement tank). Includes ground support, dewatering, temporary works, backfill, reinstatement, and chamber installation.	51,000	
• Supply and install pumps and pipe work in wet well.	36,000	
• Supply and install valve chamber, in-line air chamber and flow meter chamber. Includes concrete chamber, pipe work, valves and fittings.	27,000	
• Mechanical and electrical. Includes design, supply and installation of all mechanical and electrical fittings and equipment.	36,000	
Pump station sub total	**150,000**	**225,000**
Capital Expenditure Total	**$2,871,000**	**4,306,500**

1 Rates for the supply of clay material and substrate materials assume an available source within 20 km. Additional cartage costs for each km over and above 20 km would be in the order of $1.60 - $2.40 per m^3

2 Insufficient information was available to perform a detailed costing of the pumpstation and the cost was estimated to be 60% of the pumpstation costed for the Ohakune VFW treatment system (T+T, 2019a)

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REPORT TO: **COUNCIL**

MEETING DATE: **TUESDAY 9 JUNE 2020**

FROM: **PRINCIPAL ADVISOR: DISTRICT DEVELOPMENT MARK CLEWS**

SUBJECT: **CLIFTON TO TANGOIO COASTAL HAZARDS STRATEGY JOINT COMMITTEE**

1.0 PURPOSE AND SUMMARY - *TE KAUPAPA ME TE WHAKARĀPOPOTOTANGA*

1.1 The purpose of this report is to provide an update on for the Clifton to Tangoio Coastal Hazard Strategy Joint Committee meeting of 1 May 2020 and to formally endorse the Joint Committee's revised Terms of Reference.

1.2 The draft Terms of Reference were attached to the report of the 4 February 2020 meeting of the Joint Committee for ratification by this Council at its meeting on 19 March 2020. This action however, was omitted from the actual recommendations at that time. This report therefore seeks to correct that by recommending that the Council now formally endorses those terms of reference (Attachment 2).

1.3 As required by the revised terms of reference, summary notes from the meeting held on 4 February are attached (Attachment 1). In short the Committee directed staff to advance all workstreams as quickly as possible within the current Covid19 restrictions and budgetary constraints and adopt a phased approach to engagement. Cr Corban was also confirmed as Council's alternate member and it was noted that all Councillor workshop deferred in March needed to be reconvened.

1.4 The summary notes also cover an informal workshop that followed the meeting On the Design Workstream, showing preliminary concept designs and revised costings, and a discussion on the Funding Workstream and how to advance that with Councillors.

1.5 The Council's representative on the Technical Advisor Group will be in attendance to help answer any questions that may arise.

2.0 RECOMMENDATIONS - *NGĀ TŪTOHUNGA*

A) That the Committee receives the report titled Clifton to Tangoio Coastal Hazards Strategy Joint Committee dated 9 June 2020 and attached summary notes of the Joint Committee Meeting held on 1 May 2020.

B) That the Revised Terms of Reference for the Clifton to Tangoio Coastal Hazards Strategy Joint Committee attached to the report be endorsed.

Attachments:

1⇩	Clifton to Tangoio Coastal Hazards Strategy 2020 Summary of 1 May 2020 Meeting	STR-14-07-20-644
2⇩	Joint Committee Terms of Reference	CG-16-2-00054

Clifton to Tangoio Coastal Hazards Strategy
Summary Notes of Meeting held 1 May 2020

1. PURPOSE

This briefing note has been prepared to communicate the activity of the Clifton to Tangoio Coastal Hazards Strategy Joint Committee to the Partner Councils, as the Committee progresses with Stage 4 of the Strategy. More information on the Strategy can be found on the project website at www.hbcoast.co.nz.

2. JOINT COMMITTEE MEETING SUMMARY: 1 MAY 2020

Key points from the Joint Committee meeting held 1 May 2020 are highlighted below. The full minutes of the meeting will be provided to each Partner Council in due course.

Confirm Alternate Appointments

- Confirmation that Cr Martin Williams (HBRC) and Cr Alwyn Corban (HDC) have been appointed as alternates to the Joint Committee. Cr Nigel Simpson has previously been confirmed as the alternate for NCC.

Strategy Engagement

- Planned community engagement under the Strategy has been impacted by COVID-19 restrictions.
- The Committee endorsed a proposal to implement a phased approach to engagement, starting with virtual, light community engagement and then moving to more targeted and comprehensive face to face engagement as alert levels allow.

Project Managers Update

- COVID-19 has impacted the ability of the project team to advance some elements of the Strategy.
- Various options were presented for advancing project work under COVID-19. The Committee directed staff to advance all workstreams as quickly as possible within the current restrictions and within budgetary constraints.
- The importance of Councillor engagement was highlighted, noting that an all Councillor workshop in early March was deferred and needed to be reconvened.

Workshop

- A workshop was held following the ordinary meeting. Two key topics were discussed:
  - Update from the Design Workstream showing preliminary concept designs and revised costings for the first step of each long-term adaptive pathway. The designs and costings are subject to change as a result of external peer review and need to be discussed with panel members as a next step.
  - A discussion on the Funding Workstream, and how to advance this work with Councillors given COVID restrictions and the outcome of workshops held with each Council in August 2019. Next steps are to reconvene the all-Councillor workshop that was to be held in March as COVID restrictions allow. Discussions with each Council ahead of that combined workshop are also planned.

Next Meeting

- The next formal meeting of the Joint Committee will be held on 7 August 2020, however discussions and workshops with Councillors from all Partner Councils are being planned before then.

Terms of Reference for the Clifton to Tangoio Coastal Hazards Strategy Joint Committee

As at 28 September 2018

As adopted by resolution by:
Hastings District Council 23 March 2017
Napier City Council 31 May 2017
Hawke's Bay Regional Council 28 June 2017

1. Definitions

For the purpose of these Terms of Reference:

- "**Act**" means the Local Government Act 2002.
- "**Administering Authority**" means Hawke's Bay Regional Council.
- "**Coastal Hazards Strategy**" means the Coastal Hazards Strategy for the Hawke Bay coast between Clifton and Tangoio[1].
- "**Council Member**" means an elected representative appointed by a Partner Council.
- **"Hazards"** means natural hazards with the potential to affect the coast, coastal communities and infrastructure over the next 100 years, including, but not limited to, coastal erosion, storm surge, flooding or inundation of land from the sea, and tsunami; and includes any change in these hazards as a result of sea level rise.
- "**Joint Committee**" means the group known as the Clifton to Tangoio Coastal Hazards Strategy Joint Committee set up to recommend both draft and final strategies to each Partner Council.
- "**Member**" in relation to the Joint Committee means each Council Member and each Tangata Whenua Member.
- "**Partner Council**" means one of the following local authorities: Hastings District Council, Napier City Council and Hawke's Bay Regional Council.
- "**Tangata Whenua Appointer**" means:
    - The trustees of the Maungaharuru-Tangitū Trust, on behalf of the Maungaharuru-Tangitū Hapū;
    - Mana Ahuriri Incorporated, on behalf of Mana Ahuriri Hapū;
    - Heretaunga Tamatea Settlement Trust, on behalf of the hapū of Heretaunga and Tamatea.
- "**Tangata Whenua Member**" means a member of the Joint Committee appointed by a Tangata Whenua Appointer

[1] The Coastal Hazards Strategy is further defined in Appendix 1 to these Terms of Reference.

2. Name and status of Joint Committee

2.1 The Joint Committee shall be known as the Clifton to Tangoio Coastal Hazards Strategy Joint Committee.

2.2 The Joint Committee is a joint committee under clause 30(1)(b) of Schedule 7 of the Act.

3. Partner Council Members

3.1 Each Partner Council shall appoint three Council Members and alternates to the Joint Committee. If not appointed directly as Council Members, the Mayors of Hastings District Council and Napier City Council and the Chairperson of Hawke's Bay Regional Council are ex officio Council Members.

3.2 Under clause 30(9) Schedule 7 of the Act, the power to discharge any Council Member on the Joint Committee and appoint his or her replacement shall be exercisable only by the Partner Council that appointed the Member.

4. Tangata Whenua Members

4.1 Each Tangata Whenua Appointer may appoint one member to sit on the Joint Committee.

4.2 Each Tangata Whenua Appointer must make any appointment and notify all Tangata Whenua Appointers and Partner Councils in writing of the appointment.

4.3 The Tangata Whenua Members so appointed shall be entitled to vote.

4.4 Under clause 30(9) Schedule 7 of the Act, the power to discharge any Tangata Whenua Member on the Joint Committee and appoint his or her replacement shall be exercisable only by the Tangata Whenua Appointer that appointed the Member.

5. Purpose of Terms of Reference

5.1 The purpose of these Terms of Reference is to:

5.1.1 Define the responsibilities of the Joint Committee as delegated by the Partner Councils under the Act.

5.1.2 Provide for the administrative arrangements of the Coastal Hazards Strategy Joint Committee as detailed in Appendix 2.

6. Meetings

6.1 Members, or their confirmed alternates, will attend all Joint Committee meetings.

7. Delegated authority

The Joint Committee has the responsibility delegated by the Partner Councils for:

7.1 Guiding and providing oversight for the key components of the strategy including:
- The identification of coastal hazards extents and risks as informed by technical assessments;
- A framework for making decisions about how to respond to those risks;
- A model for determining how those responses shall be funded; and
- A plan for implementing those responses when confirmed.

7.2 Considering and recommending a draft strategy to each of the Partner Councils for public notification;

7.3 Considering comments and submissions on the draft strategy and making appropriate recommendations to the Partner Councils;

7.4 Considering and recommending a final strategy to each of the Partner Councils for approval;

7.5 Advocating for and/or advancing the objectives of the strategy by submitting on and participating in processes, including but not limited to:
- Council long term plans;
- Council annual plans;
- District and regional plan and policy changes;
- Reserve management plans;
- Asset management plans;
- Notified resource consent applications;
- Central Government policy and legislation.

7.6 Investigating and securing additional sources of funding to support strategy implementation.

8. Powers not delegated

The following powers are not delegated to the Joint Committee:

8.1 Any power that cannot be delegated in accordance with clause 32 Schedule 7 of the Local Government Act 2002.

8.2 The determination of funding for undertaking investigations, studies and/or projects to assess options for implementing the Coastal Hazards Strategy.

9. Remuneration

9.1 Each Partner Council shall be responsible for remunerating its representatives on the Joint Committee and for the cost of those persons' participation in the Joint Committee.

9.2 The Administering Authority shall be responsible for remunerating the Tangata Whenua Members.

10. Meetings

10.1 The Hawke's Bay Regional Council standing orders will be used to conduct Joint Committee meetings as if the Joint Committee were a local authority and the principal administrative officer of the Hawke's Bay Regional Council

or his or her nominated representative were its principal administrative officer.

10.2 The Joint Committee shall hold all meetings at such frequency, times and place(s) as agreed for the performance of the functions, duties and powers delegated under this Terms of Reference.

10.3 Notice of meetings will be given well in advance in writing to all Joint Committee Members, and not later than one month prior to the meeting.

10.4 The quorum shall be 6 Members, provided that at least one Partner Council Member is present from each Partner Council.

11. Voting

11.1 In accordance with clause 32(4) Schedule 7 of Act, at meetings of the Joint Committee each Council Member has full authority to vote and make decisions within the delegations of this Terms of Reference on behalf of the Partner Council without further recourse to the Partner Council.

11.2 Where voting is required, all Members of the Joint Committee have full speaking rights.

11.3 Each Member has one vote.

11.4 Best endeavours will be made to achieve decisions on a consensus basis.

11.5 As per HBRC Standing Order 18.3: The Chairperson at any meeting does not have a deliberative vote and, in the case of equality of votes, has no casting vote.

12. Election of Chairperson and Deputy Chairperson

12.1 On the formation of the Joint Committee the members shall elect a Joint Committee Chairperson and may elect up to two Deputy Chairpersons. The Chairperson is to be selected from the group of Council Members.

12.2 The mandate of the appointed Chairperson or Deputy Chairperson ends if that person through resignation or otherwise ceases to be a member of the Joint Committee.

13. Reporting

13.1 All reports to the Committee shall be presented via the Technical Advisory Group[2] or from the Committee Chairperson.

13.2 Following each meeting of the Joint Committee, the Project Manager shall prepare a brief summary report of the business of the meeting and circulate that report, for information to each Member following each meeting. Such reports will be in addition to any formal minutes prepared by the Administering Authority which will be circulated to Joint Committee representatives.

13.3 The Technical Advisory Group shall ensure that the summary report required by 13.2 is also provided to each Partner Council for inclusion in the agenda for the next available Council meeting. A Technical Advisory Group

[2] A description of the Technical Advisory Group and its role is included as Appendix 2 to these Terms of Reference.

Member shall attend the relevant Council meeting to speak to the summary report if requested and respond to any questions.

14. Good faith

14.1 In the event of any circumstances arising that were unforeseen by the Partner Councils, the Tangata Whenua Appointers, or their respective representatives at the time of adopting this Terms of Reference, the Partner Councils and the Tangata Whenua Appointers and their respective representatives hereby record their intention that they will negotiate in good faith to add to or vary this Terms of Reference so to resolve the impact of those circumstances in the best interests of the Partner Councils and the Tangata Whenua Appointers collectively.

15. Variations to these Terms of Reference

15.1 Any Member may propose a variation, deletion or addition to the Terms of Reference by putting the wording of the proposed variation, deletion or addition to a meeting of the Joint Committee.

15.2 Amendments to the Terms of Reference may only be made with the approval of all Members.

16. Recommended for Adoption by

16.1 The Coastal Hazards Strategy Joint Committee made up of the following members recommends this Terms of Reference for adoption to the three Partner Councils:

Napier City Council represented by Cr Annette Brosnan, Cr Hayley Browne and Cr Keith Price.
Appointed by NCC resolution 19 November 2019

Hastings District Council represented by Cr Tania Kerr, Cr Ann Redstone and Cr Malcolm Dixon
Appointed by HDC resolution 10 December 2019

Hawke's Bay Regional Council represented by Cr Rick Barker, Cr Hinewai Ormsby and Cr Jerf van Beek
Appointed by HBRC resolution 6 November 2019

Maungaharuru-Tangitū Trust (MTT) represented by Ms Tania Hopmans

Mana Ahuriri Trust represented by Ms Tania Huata

Heretaunga Tamatea Settlement Trust represented by Mr Peter Paku

Appendix 1 – Project Background

Project Goal

A Clifton to Tangoio Coastal Hazards Strategy is being developed in cooperation with the Hastings District Council (HDC), the Hawke's Bay Regional Council (HBRC), the Napier City Council (NCC), and groups representing Mana Whenua and/or Tangata Whenua. This strategy is being developed to provide a framework for assessing coastal hazards risks and options for the management of those risks for the next 105 years from 2015 to 2120.

The long term vision for the strategy is that coastal communities, businesses and critical infrastructure from Tangoio to Clifton are resilient to the effects of coastal hazards.

Project Assumptions

The Coastal Hazards Strategy will be based on and influenced by:

- The long term needs of the Hawke's Bay community
- Existing policies and plans for the management of the coast embedded in regional and district council plans and strategies.
- Predictions for the impact of climate change
- The National Coastal Policy Statement

Project Scope

The Coastal Hazards Strategy is primarily a framework for determining options for the long term management of the coast between Clifton and Tangoio. This includes:

- Taking into account sea level rise and the increased storminess predicted to occur as a result of climate change, an assessment of the risks posed by the natural hazards of coastal erosion, coastal inundation and tsunami.
- The development of a framework to guide decision making processes that will result in a range of planned responses to these risks
- The development of a funding model to guide the share of costs, and mechanisms to cover those costs, of the identified responses.
- The development of an implementation plan to direct the implementation of the identified responses.
- Stakeholder involvement and participation.
- Protocols for expert advice and peer review.
- An action plan of ongoing activity assigned to various Members.

The Strategy will:

- Describe a broad vision for the coast in 2120, and how the Hawke's Bay community could respond to a range of possible scenarios which have the potential to impact the coast by 2120.

- Propose policies to guide any intervention to mitigate the impact of coastal processes and hazards through the following regulatory and non-regulatory instruments:
    - Regional Policy Statement
    - District Plans
    - Council long-term plans
    - Infrastructure Development Planning (including both policy and social infrastructure networks).

Appendix 2 - Administering Authority and Servicing

The administering authority for the Coastal Hazards Strategy Joint Committee is Hawke's Bay Regional Council.

The administrative and related services referred to in clause 16.1 of the conduct of the joint standing committee under clause 30 Schedule 7 of the Local Government Act 2002 apply.

Until otherwise agreed, Hawke's Bay Regional Council will cover the full administrative costs of servicing the Coastal Hazards Strategy Joint Committee.

A technical advisory group (TAG) will service the Coastal Hazards Strategy Joint Committee.

The TAG will provide for the management of the project mainly through a Project Manager. TAG will be chaired by the Project Manager, and will comprise senior staff representatives from each of the participating councils and other parties as TAG deems appropriate from time to time. TAG will rely significantly on input from coastal consultants and experts.

The Project Manager and appropriate members of the TAG shall work with stakeholders. Stakeholders may also present to or discuss issues directly with the Joint Committee.

1. Functions of the TAG include:
    - Providing technical oversight for the study.
    - Coordinating agency inputs particularly in the context of the forward work programmes of the respective councils.
    - Ensuring council inputs are integrated.

Item 10

REPORT TO: **COUNCIL**

MEETING DATE: **TUESDAY 9 JUNE 2020**

FROM: **MANAGER: DEMOCRACY AND GOVERNANCE JACKIE EVANS**

SUBJECT: **2020 LOCAL GOVERNMENT NEW ZEALAND ANNUAL GENERAL MEETING AND REMIT PROCESS**

1.0 EXECUTIVE SUMMARY - *TE KAUPAPA ME TE WHAKARĀPOPOTOTANGA*

1.1 The purpose of this report is to: nominate Councillors for attendance at the 2020 Local Government New Zealand (LGNZ) Annual General Meeting (AGM) which will now be held in Wellington on Friday, 21 August 2020, and to advise on the process for submitting proposed remits for consideration at the LGNZ AGM

1.2 This report concludes by recommending that the Council nominate 4 councillors to attend the AGM and consider it would wishes to prepare a remit for submission.

2.0 RECOMMENDATIONS - NGĀ TŪTOHUNGA

A) That the Council receives the report titled 2020 Local Government New Zealand Annual General Meeting and Remit Process

B) That the following Councillors accompany the Mayor (Presiding Delegate) and attend the LGNZ Annual General Meeting to be held in Wellington on 21 August 2020.

Councillor _____ (Alternate)

Councillor _____

Councillor_____

Councillor_____

C) That the following remits be prepared for submission to the LGNZ AGM:

3.0 BACKGROUND – *TE HOROPAKI*

3.1 The conference and AGM will be held in the Oceania Room, Museum of New Zealand Te Papa, Tongarewa, Wellington, on Friday 21 August.

4.0 DISCUSSION - *TE MATAPAKITANGA*

4.1 This year Hastings District Council is entitled to 5 votes at the AGM. The voting entitlement of each member authority is determined by the Authority's subscription levels

4.2 In addition to the Mayor, Council approval for attendance at previous AGM and conferences has been as follows:

- 2015 - Rotorua – Councillors Heaps, Pierce and Hazlehurst
- 2016 - Dunedin - Councillors Hazlehurst, Heaps, Kerr and Nixon
- 2017 - Auckland – Councillors Barber, Dixon, Harvey and Heaps
- 2018 - Christchurch – Councillors Kerr, Schollum and Travers
- 2019 - Wellington – Councillors Barber, Harvey and Lawson

Remits

4.3 All Councils have been invited to submit proposed remits for the LGNZ AGM to be held on Friday, 21 August 2020. The deadline for submission has been announced as Tuesday 16 June 2020. Notice has been provided to allow members of zones and sectors to gain the required support necessary for their remit.

4.4 Proposed remits should only relate to the internal governance and constitution of Local Government New Zealand, and relate to "issues of the moment". Remits must have formal support from at least one sector group meeting, or any 5 councils, prior to being submitted.

4.5 Councillors requested feedback on the 30 remits which were accepted by LGNZ conference in 2019 and previously. LGNZ has advised that the speed of progress depends mostly on competing demands and opportunities, and undertook to provide an updated remit register in the near future. Notably, after six months of lobbying, the Minister for Justice, Andrew Little has decided to review the Sale and Supply of Alcohol Act. This was the subject of a remit submitted by this Council last year. However there has been no progress from the Associate Minster for Housing to allow councils to apply for income related rents (submitted by Napier). Councillors also asked for an update on remits relating to water quality and stormwater. There have been no remits submitted on water quality or stormwater. The only remit on water related to nitrates, which was submitted last year.

4.6 The remit process is set out in the attached memo from LGNZ. Research and preparation of remits takes a significant amount of officer time, as does lobbying other Councils for support. Almost all remits submitted last year were accepted by the conference.

4.7 To minimise disruption to current workloads any remit submitted should only be a matter of substantial policy interest where background research and information is readily available and there is a clear direction on the suggested action that could be taken by LGNZ.

5.0 OPTIONS - *NGĀ KŌWHIRINGA*

Option One - Recommended Option - *Te Kōwhiringa Tuatahi – Te Kōwhiringa Tūtohunga*

5.1 To consider whether to submit one or more remits to the LGNZ AGM.

5.2 To nominate 4 Councillors in addition to the Mayor to attend the LGNZ AGM on to be held on 21 August 2020.

Attachments:

1⇩ Amended Remit Process Memo CG-16-2-00202

MEMORANDUM

We are. LGNZ.
Te Kāhui Kaunihera ō Aotearoa.

Date:	25 May 2020
To:	Mayors, Chairs and Chief Executives, Zone Secretaries and Sector Chairs
From:	Malcolm Alexander, Chief Executive, LGNZ
Subject:	**Amended 2020 Annual General Meeting Remit Process for 21 August 2020 AGM**

Given the improvement in the COVID 19 situation, and at the direction of National Council, we invite member authorities wishing to submit proposed remits for consideration at the Local Government New Zealand Annual General Meeting (AGM) to be held on **Friday 21 August 2020** at Te Papa, in Wellington, to do so no later than **5:00pm, Tuesday 16 June 2020.** We apologise for the changes made to the remit process over the past two months, it has been outside of our control.

Proposed remits should be sent with the attached form. The full remit policy can be downloaded from the LGNZ website.

Remit policy

Proposed remits, other than those relating to the internal governance and constitution of Local Government New Zealand, should address only major strategic "issues of the moment". They should have a national focus articulating a major interest or concern at the national political level.

The National Council's Remits Screening Policy is as follows:

1. Remits must be relevant to local government as a whole, rather than exclusively relevant to a single zone or sector group, or an individual council;
2. Remits should be of a major policy nature (constitutional and substantive policy) rather than matters that can be dealt with by administrative action;
3. Remits must have formal support from at least one zone or sector group meeting, or five councils, prior to them being submitted, in order for the proposer to assess support and achieve clarity about the ambit of the proposal;
4. Remits defeated at the AGM in two successive years will not be permitted to go forward;
5. Remits will be assessed to determine whether the matters raised can be actioned by alternative, and equally valid, means to achieve the desired outcome;
6. Remits that deal with issues or matters currently being actioned by Local Government New Zealand may also be declined on the grounds that the matters raised are "in-hand". This does not include remits that deal with the same issue but from a different point of view; and
7. Remits must be accompanied by background information and research to show that the matter warrants consideration by delegates. Such background should demonstrate the:
   - Nature of the issue;
   - Background to it being raised;
   - Issue's relationship, if any, to the current Local Government New Zealand Business Plan and its objectives;

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- Level of work, if any, already undertaken on the issue by the proposer, and outcomes to date;
- Resolution, outcome and comments of any zone or sector meetings which have discussed the issue; and
- Suggested actions that could be taken by Local Government New Zealand, should the remit be adopted.

Remit process

Local Government New Zealand will take the following steps to finalise remits for the 2020 AGM:

- All proposed remits and accompanying information must be forwarded to Local Government New Zealand no later than **5:00pm, Tuesday 16 June 2020** to allow time for the remits committee to properly assess remits;
- A remit screening committee (comprising the President, Vice President and Chief Executive) will review and assess proposed remits against the criteria described in the above policy;
- Prior to their assessment meeting, the remit screening committee will receive analysis from the Local Government New Zealand staff on each remit, assessing each remit against the criteria outlined in the above policy;
- Proposed remits that fail to meet specified criteria will be informed as soon as practicable of the committee's decision, alternative actions available, and the reasons behind the decision;
- Proposers whose remits meet the criteria will be contacted as soon as practicable to arrange the logistics of presenting the remit to the AGM; and
- All accepted remits will be posted to the Local Government New Zealand website, and proposed remits will be sent to members on **19 June 2020** to provide members with sufficient time to consider them before the AGM on 21 August 2020 will be informed, at least one month prior to the AGM in order to allow members sufficient time to discuss the remits prior to the AGM.

To ensure quality preparation for members' consideration at the AGM, the committee will not consider or take forward proposed remits that do not meet the Remit Policy, or are received after **5:00pm, Tuesday 16 June 2020.**

General

Remits for AGM consideration also will be included formally in the AGM Business Papers that will be distributed to delegates no later than two weeks before the AGM, as required by the Rules (although as noted above, the proposed remits will be available for member consideration before the AGM papers are issued to the membership).

Should you require further clarification of the requirements regarding the remit process, please contact Leanne Brockelbank on 04 924 1212 or leanne.brockelbank@lgnz.co.nz.

Annual General Meeting 2020

Remit application

Council Proposing Remit:	
Contact Name:	
Phone:	
Email:	
Fax:	
Remit passed by: (Zone/sector meeting and/or list five councils as per policy)	
Remit:	

Background information and research:

Please attach separately and include:

- Nature of the issue;
- Background to its being raised;
- New or confirming existing policy;
- How the issue relates to objectives in the current Work Programme;
- What work or action on the issue has been done, and the outcome;
- Any existing relevant legislation, policy or practice;
- Outcome of any prior discussion at a Zone or Sector meeting;
- Evidence of support from a Zone/sector meeting, or five councils; and
- Suggested course of action envisaged.

Please forward to:
Local Government New Zealand
Leanne Brockelbank, Deputy Chief Executive Operations
P O Box 1214
Wellington 6140
leanne.brockelbank@lgnz.co.nz

No later than 5:00pm, Tuesday 16 June 2020.

3

MEMORANDUM

We are. LGNZ.
Te Kāhui Kaunihera ō Aotearoa.

Date: 25 May 2020

To: Mayors, Chairs and Chief Executives

From: Malcolm Alexander, Chief Executive, LGNZ

Subject: **Further Notice of revised date for Local Government New Zealand 2020 Annual General Meeting – now 21 August 2020**

Given the improvement in the COVID-19 situation, and at the direction of National Council, the Local Government New Zealand 2020 Annual General Meeting will now be moved forward to **Friday 21 August 2020**. The AGM will still take place in the Oceania Room, Museum of New Zealand Te Papa Tongarewa, Wellington. The AGM is scheduled to start at 9am and is likely to run for a minimum of two hours.

The new AGM date of 21 August 2020 is still a technical breach of Rule G1 (being after the end of July) but in order to run the remit process as required by Rule G2 and bearing in mind that it is a member's right to bring forth remits for the AGM, the date of 21 August 2020 balances a now slight delay in the AGM (driven by COVID-19) with the right of members to bring remits to the AGM.

We are anticipating that by 21 August 2020 New Zealand will be at Alert Level 1 allowing a full AGM to take place. If for any reason Alert Level 2 is in place on 21 August 2020, then attendees at the AGM will be limited to 100 people. We will provide further advice to members in the event Alert Level 2 restrictions look likely to be in place.

Members should note that depending on the outcome of the nomination processes for President and Vice-President (currently open for nomination until 31 May 2020), an election for President and Vice-President may occur at this AGM.

Registrations for the LGNZ 2020 Annual General Meeting (AGM) now are open. A registration form is attached.

Please fill in the form and return it to leanne.brockelbank@lgnz.co.nz no later than **5pm Friday 31 July 2020**. Any apologies must also be received by this date.

All information about registering for the AGM, including the maximum number of delegates that may represent your council, is included on the form. It also contains information and key dates regarding remits and obituaries.

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Before returning, please ensure that both the Mayor/Chair and Chief Executive have signed the form.

The AGM business papers and a copy of the Annual Report will be sent on Friday 7 August 2020. Before that date, and in order to ensure that members have the maximum time to consider their position, the remits for the AGM will be circulated to members after approval by the LGNZ Remit Screening Committee. This is expected to occur on 19 June 2020. A further copy of the remits will be included in the formal AGM papers.

If you have any questions, please call Leanne Brockelbank, Deputy Chief Executive Operations, LGNZ on (04) 924 1212. Alternatively, you can email leanne.brockelbank@lgnz.co.nz.

I recognise that changes in dates for the AGM may be frustrating for members. Unfortunately this is driven by the changing COVID-19 situation and a desire by National Council to hold the AGM as close as possible to the originally scheduled date in July.

We are. LGNZ.
Te Kāhui Kaunihera ō Aotearoa.

33rd Annual General Meeting of Local Government New Zealand

Registration form

Date: Friday 21 August 2020

Venue: Oceania Room, Museum of New Zealand Te Papa Tongarewa, Wellington

MEMBERSHIP

As Hastings District Council is a member of Local Government New Zealand, it is entitled to representation at the 2020 Local Government New Zealand Annual General Meeting (AGM).

The representation of each member authority is determined by the Mayor or Chair of each local authority. Representation is made up of members which include elected members and staff of all fully financial local authorities.

The Annual General Meeting is open to members only.

VOTING ENTITLEMENTS

Hastings District Council is entitled to 5 votes at the 2020 AGM. The voting entitlement of each member authority is determined by that authority's subscription levels. No member authority whose annual subscription is in arrears is entitled to vote at the AGM. A list of voting entitlements can be found in rule H1 of the constitution.

DELEGATES

All delegates for the Annual General Meeting must register by Friday 31 July 2020.

The maximum number of delegates for each local authority at the AGM is determined by that local authority's population. Hastings District Council is entitled to be represented by 4 delegates at the 2020 AGM.

Please note that the number of delegates at the AGM does not affect the number of delegates able to attend the conference.

PRESIDING DELEGATE

A presiding delegate is the person responsible for voting on behalf of the authority at the AGM. You must appoint one presiding delegate.

Presiding delegate's name: _____Signature:_____

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OTHER DELEGATES

Hastings District Council may be represented by up to 4 other delegates.

If your presiding delegate is absent from the AGM, 'other delegates' may vote on behalf of the local authority. Please tick the box next to the delegate's name if they are to have this right.

Other Delegate name:_____Signature:_____ Voting rights: ☐

Other Delegate name:_____Signature:_____ Voting rights: ☐

Other Delegate name:_____Signature:_____ Voting rights: ☐

Other Delegate name:_____Signature:_____ Voting rights: ☐

OBSERVERS

Persons attending the AGM as observers will have no speaking or voting rights and will be seated separately from the main delegation. Please list any observers below.

Observers name:_____Signature:_____

Observers name:_____Signature:_____

Observers name:_____Signature:_____

Observers name:_____Signature:_____

Please ensure that all delegates are aware of the delegate role they have been nominated for.

Once this form is complete, the Mayor/Chair and Chief Executive of the local authority must sign the form below.

Mayor's/Chair's Name:_____ Signature:_____

Chief Executive's Name:_____ Signature:_____

Please return this form by **Friday 31 July 2020** either by email to leanne.brockelbank@lgnz.co.nz *or* post this form to:

Leanne Brockelbank
Deputy Chief Executive Operations
Local Government New Zealand
PO Box 1214
WELLINGTON 6140

Level 1
113 Lambton Quay
Wellington 6011

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Wellington 6140
New Zealand

P: 64 4 924 1200

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REMIT PROCESS

Remits proposed for consideration at the Local Government New Zealand AGM must be received no later than **5pm Tuesday 16 June 2020.** All proposed remits and accompanying information must meet the remit policy. Those meeting this policy will be screened by the Remit Screening Committee on **Wednesday 17 June 2020**, and following approval, will move forward to the Annual General Meeting for consideration by the membership.

OBITUARIES

Local Government New Zealand request obituary notices for inclusion in the AGM proceedings for the period from the last AGM on **Sunday 7 July 2019** onwards. These should be advised in writing no later than **Monday 3 August 2020.**

PROXIES

The votes provided for in H1 may be exercised be a member authority by Proxy. Proxies must be appointed in writing at least 48 hours before the time in which the AGM is to commence (Rule G22). Therefore a completed proxy form must be received before **9am on Wednesday 19 August 2020.** If you require a proxy form, please let us know.

For further clarification of the requirements regarding the Annual General Meeting, please contact Leanne Brockelbank on 04 924 1212. Alternatively, you can email Leanne at leanne.brockelbank@lgnz.co.nz.

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Attachment 1

Item 11

REPORT TO: **COUNCIL**

MEETING DATE: **TUESDAY 9 JUNE 2020**

FROM: **MANAGER: DEMOCRACY AND GOVERNANCE JACKIE EVANS**

SUBJECT: **ITEMS UNDER ACTION**

1.0 PURPOSE AND SUMMARY - *TE KAUPAPA ME TE WHAKARĀPOPOTOTANGA*

1.1 The purpose of this report is to update Council on actions raised at previous meetings.

1.2 The Council requested that officer's report back at each meeting with progress that has been made on actions that have arisen from Council meetings. Attached as **Attachment 1** is the status of items under action as at 27 May 2020.

2.0 RECOMMENDATIONS - *NGĀ TŪTOHUNGA*

A) That the Council receives the report titled Items Under Action.

Attachments:

1 Items Under Action as at 27/5/2020 CG-16-2-00079

Items Under Action as at 27 May 2020					
	Date Raised	**Due Date**	**Completed**	**Description and Action**	**Lead Officer**
1	27.11.19 Council	March 2020	Arranging for June Operations & Monitoring Committee	The Hawke's Bay Museums Trust Chair, Richard Grant, be invited to update the Council on the work being undertaken by the Trust.	Bruce Allan
2	27.11.19 - Council	March 2020	Included in Strategy &Policy workplan	To review the Financial Incentive Policy	Raoul Osterkamp
3	3 .12.19 Council	May 2020	DC Policy to be adopted 25/6/20	To make a decision on the amendment to the 2019/20 Development Contributions Policy	Bruce Allan
5	10.12.19 Council	March 2020	See report on remits on Agenda	To ask Government for an update regarding Water and Stormwater issues – LGNZ Remits	Jackie Evans
6	10.12.19 Council	2020	To be arranged.	For new Councillors to visit the Cranford Redevelopment site.	Bruce Allan
7	20 2.20	March 2020	Officers continue to explore external funding opportunities. In the meantime the first 6 months of the CBD activation plan is in progress from available funding. Officers will report back on the CBD activation plan at the end of the 6 month period.	Annual Plan - Increasing investment in Hastings CBD/ external funding streams – presentation to next Council meeting	Craig Thew
8	20.2.20	April 2020	Finance 101 training scheduled for April – to be rescheduled.	Rural/Urban Rates – briefing on how this is calculated and whether thesplit is equitable across the district	Bruce Allan
9	20.2.20	March 2020		Consider broadening representation on Hastings and Havelock North Business Associations to give another ward member the opportunity to be engaged	Mayor
10	23.4.20	May 2020	KiwiRail invoiced, negotiations continuing.	The progress on the repayment of debt that is outstanding in relation to the Railway Station fire.	Bruce Allan
11	23.4.20	May 2020	Hawke's Bay Foundation undertaking fundraising	Investigate options on how people are able to contribute to the Rapid Response Grants Fund – to boost those funds.	Alison Banks

HASTINGS DISTRICT COUNCIL

COUNCIL MEETING

TUESDAY, 9 JUNE 2020

RECOMMENDATION TO EXCLUDE THE PUBLIC

SECTION 48, LOCAL GOVERNMENT OFFICIAL INFORMATION AND MEETINGS ACT 1987

THAT the public now be excluded from the following part of the meeting, namely:

15 Flaxmere Town Centre Development Options

16 Hawke's Bay Airport

17 Appointment of Director to Hawke's Bay Airport Limited

18 Chief Executive Mid Year Performance Review

The general subject of the matter to be considered while the public is excluded, the reason for passing this Resolution in relation to the matter and the specific grounds under Section 48 (1) of the Local Government Official Information and Meetings Act 1987 for the passing of this Resolution is as follows:

GENERAL SUBJECT OF EACH MATTER TO BE CONSIDERED	*REASON FOR PASSING THIS RESOLUTION IN RELATION TO EACH MATTER, AND PARTICULAR INTERESTS PROTECTED*	*GROUND(S) UNDER SECTION 48(1) FOR THE PASSING OF EACH RESOLUTION*
15 Flaxmere Town Centre Development Options	**Section 7 (2) (i)** The withholding of the information is necessary to enable the local authority to carry on, without prejudice or disadvantage, negotiations (including commercial and industrial negotiations). To undertake negotiations.	**Section 48(1)(a)(i)** Where the Local Authority is named or specified in the First Schedule to this Act under Section 6 or 7 (except Section 7(2)(f)(i)) of this Act.

16 Hawke's Bay Airport	**Section 7 (2) (h)** The withholding of the information is necessary to enable the local authority to carry out, without prejudice or disadvantage, commercial activities. **Section 7 (2) (i)** The withholding of the information is necessary to enable the local authority to carry on, without prejudice or disadvantage, negotiations (including commercial and industrial negotiations). The Commercial activities of the Hawkes Bay Airport are covered in this report.	**Section 48(1)(a)(i)** Where the Local Authority is named or specified in the First Schedule to this Act under Section 6 or 7 (except Section 7(2)(f)(i)) of this Act.
17 Appointment of Director to Hawke's Bay Airport Limited	**Section 7 (2) (a)** The withholding of the information is necessary to protect the privacy of natural persons, including that of a deceased person. To protect the privacy of persons nominated for reappointment.	**Section 48(1)(a)(i)** Where the Local Authority is named or specified in the First Schedule to this Act under Section 6 or 7 (except Section 7(2)(f)(i)) of this Act.
18 Chief Executive Mid Year Performance Review	**Section 7 (2) (a)** The withholding of the information is necessary to protect the privacy of natural persons, including that of a deceased person. To protect the privacy of the incumbent.	**Section 48(1)(a)(i)** Where the Local Authority is named or specified in the First Schedule to this Act under Section 6 or 7 (except Section 7(2)(f)(i)) of this Act.