



## Knowledge sharing innovations: Breaking down commercial sensitivities and fostering environmental awareness and compliance

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New Zealand Government



The 4 September 2010 and 22 February 2011 Earthquakes in Christchurch, New Zealand set a new standard of Environmental Management in the South Island. With the gazetting of the Canterbury Earthquake (Resource Management Act) Order 2011 and the creation of the Canterbury Earthquake Recovery Authority, as well as the Stronger Christchurch Infrastructure Team (SCIRT) to manage the rebuild, the Environmental Leadership Group (ELG) was formed to drive change in environmental behaviour in civil construction.

This paper outlines the development and success of the ELG. The makeup of the ELG was 5 Environmental Advisors from each of the SCIRT Alliance delivery teams, (Fulton Hogan, McConnell Dowell, Downer, Fletcher Contracting and City Care) and a Coordinator from the SCIRT Integrated Services Team. The ELG's objective was to use collaboration and adaptive management to change environmental behaviour. This was accomplished by focusing on key risks which included significant trees, archaeology and heritage, hydrocarbon spills, wastewater overflows and sediment discharges. Several Environmental Management tools were developed during the process, including audits, core training, and environmental advice from the bottom up as well as the top down.

The process has influenced environmental behaviour that is still seen on construction sites in the South Island today. The ELG continues to meet after the disbanding of CERA and SCIRT to ensure lessons learned are replicated

throughout the construction industry. Much of the framework developed by SCIRT has continued in the North Canterbury Transportation Infrastructure Recovery (NCTIR) Project Alliance, which is rebuilding North Canterbury's transportation network after the 14 November 2016 Earthquake.

Keywords: alliance team work, environmental behaviour, maturity, environmental leadership group, civil construction, SCIRT and NCTIR

## INTRODUCTION

On 4 September 2010 and then 5 months later on 22 February 2011, two strong earthquakes occurred in Christchurch, New Zealand (NZ). These natural disasters would set precedent for higher standards in NZ environmental management.

This paper will outline how the Stronger Christchurch Infrastructure Rebuild Team's (SCIRT) Environmental Leadership Group (ELG) broke down commercial sensitivity, using collaboration and adaptive management to change environmental behaviour. SCIRT's structure and objectives will be outlined and a selection of strategic methods and tools used to identify and control key project risks.

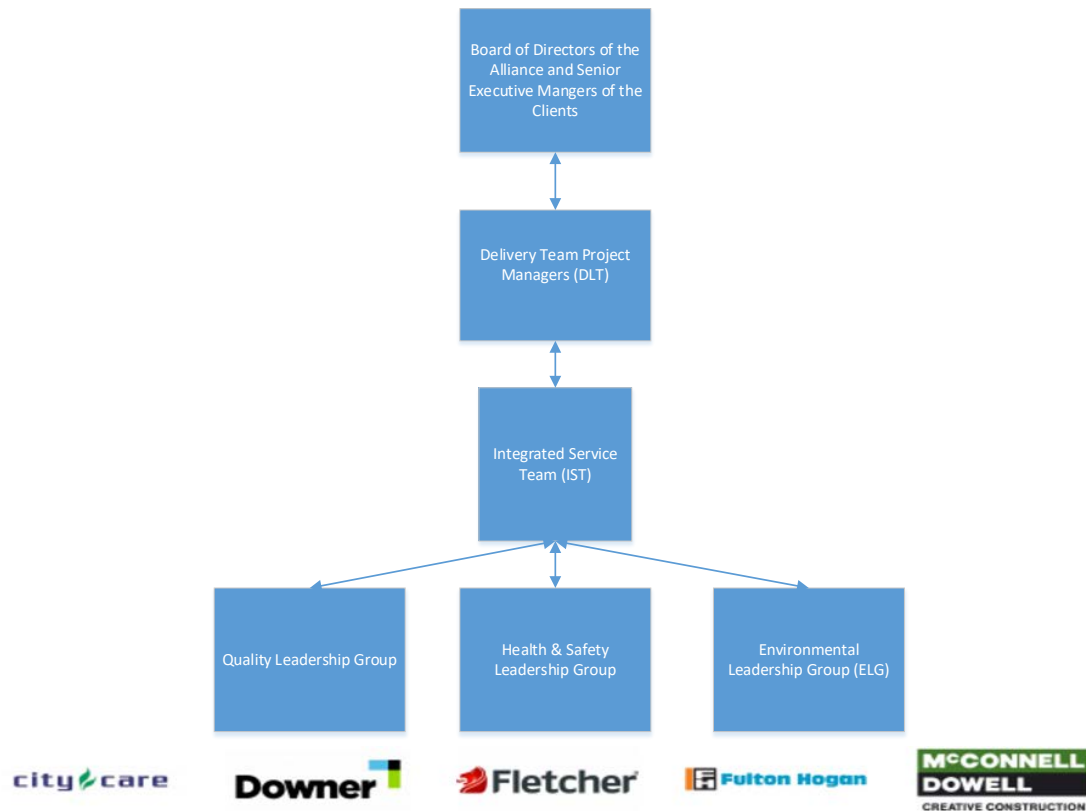
This paper finishes with a discussion on SCIRT's collaborative alliance potential unattended consequences. In its summary it will provide insight into the current ELG, which continues to meet to foster greater environmental awareness.

## SCIRT

The Canterbury Earthquake (Resource Management Act) Order 2011 was issued by the Governor-General, to begin recovery works in the region (Governor-General Satyanand, 2011). The following month CERA was formed under Canterbury Earthquake Recovery Act 2011 to direct such works (Crown, 2011). The SCIRT Alliance was then organised to rebuild damaged horizontal infrastructure (Crown, University of Canterbury, & University of Auckland, 2017). The project was a 5.5 year \$2.2 billion NZD competitive alliance between civil construction companies Fulton Hogan, McConnell Dowell, Downer, City Care and Fletcher Construction (Crown, University of Canterbury, et al., 2017). Each company, known as a Delivery Team (DT), worked together, breaking down commercial sensitivity, by building a strong communication and planning framework.

In order to define the purpose and direction of planning for SCIRT a Board was formed. Each DT's NZ Branch CEO was a representative on the Board, along with the Client (i.e., Christchurch City Council (CCC) and NZ Government (Crown)). Each Project Manager from the DT's made up the Delivery Leads Team (DLT), which insured the Boards' governance were actioned and advice from the ELG was received. Figure 1 provides a basic flow chart of SCIRT's framework.

Figure 1. Flow chart of the SCIRT Management Framework



The ELG was developed to achieve SCIRT’s environmental objectives. The objectives were a set of Key Performance Indicators (KPIs) (see Table 1), established to develop environmental awareness and build a robust environmental audit process through collaboration.

**Table 1. SCIRT Key Performance Indicators (KPIs) under the Environmental KRA**

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Environmental Hazards <i>[Record of potential risks]</i>
Environmental Near Misses <i>[Record of hazards that have a high potential of series damage to the environment]</i>
Environmental Opportunities <i>[Record of discussions of environmental risks on-site, but not the EA’s]</i>
Environmental Audits <i>[Internal Weekly and Monthly Audits]</i>
Environmental Team Initiatives <i>[Innovative situations/methods to improve or protect work related to the environment]</i>
Major Environmental Non Compliance <i>[Number per the month and required notifications sent]</i>
Environmental Compliance Questionnaire <i>[looks compliance over the previous three months for a score]</i>
Number of Environmental Incidents <i>[Number per that month]</i>
Infringement Notices <i>[Enforcement tool issued for minor to major non-compliance of resource consent or breaches to RMA]</i>
Abatement Notices <i>[Enforcement tool requesting to stop or to do something if the RMA is breached]</i>

Often there is a perceived threat that sharing methods and designs for engineering works could potentially affect commercial profits. Through collaboration amongst its membership, the ELG broke this perception. It comprised of at least one Environmental Advisor (EA) from each DT and a Co-ordinator from the Integrated Service Team (IST), a core support group seconded from the DTs. The EA's role was a complex role providing technical planning, environmental engineering and risk advice regarding SCIRT's objectives and the construction team's known and un-known on-site risks. The diversity of advisors provided a plethora of environmental knowledge that was shared across DTs and their sub-contractors.

## BACKGROUND

The ELG's design and communication was an ideal model for breaking down commercial sensitivity. This stemmed from like minds and a cohesive environmental message. A unifying charter (see Appendix A) was the first tool used in order to understand the group's boundaries in commercial sensitive industry.

An important tool to manage environment requirements is an Environmental Management System (EMS) (Tung, Baird, & Schoch, 2014). Each DT had its own EMS; most were certified as ISO 14001 compliant. Each EMS was tailored to insure they contained needed information to control for Recourse Consent Conditions and unique methods for construction by sub-contractors. The IST Co-ordinator reviewed each EMS (for an example see Appendix B) and supporting documents to insure the SCIRT's objectives (i.e., KRAs) were met. Each DT's EA was encouraged to view the other DT's environmental documents, capturing the best of each DT's experiences and knowledge. The ELG would meet every two weeks to discuss lessons learned or ask for help and resources for solving problems. These lessons learned would then be distributed to all DTs to help insure similar problems were not repeated.

Later in SCIRT's continued dynamic evolution, the ELG introduced Minimum Standards (see Appendix C). These standards set the boundaries for the key risks on the project which included significant trees, archaeology and heritage, hydrocarbon spills, wastewater overflows and sediment discharges. To insure SCIRT's Minimum Standards were compliant a Gap Analyses was completed; each DT's EMS was then modified to meet the standards.

One of the KPIs listed under in Table 1, Quality of Environmental Auditing Results was critical in maintaining SCIRT's Minimum Standards. This Audit (see Appendix D), was conducted by the IST Co-ordinator or at least 2 EAs from different DT's and then reviewed by IST to insure impartiality. This KPI reviewed one Monthly Audit from each DT which was completed by site staff who was empowered with ownership and

leadership of a site (see Appendix E for an example Monthly Audit). The score of this audit and the other KPIs were tallied to monitor environmental performance and provided weighting for the competitive alliance.

## DISCUSSION

SCIRT was a competitive alliance where each DT competed to receive allocated work (Crown, University of Auckland, & University of Canterbury, 2017). The KPIs of the Environmental KRA were used as 10% weighting of non-cost competitive points (Crown, University of Auckland, & University of Canterbury, n.d.).

In the context of the environment, this arrangement worked well in the beginning; however, it was soon noted that there were some unintended consequences. There was a potential for DTs to provide volume not value in KPIs, breaking away from their objective of encouraging proactive on-site environmental behaviour. For example, environmental conversations were recorded for the KPI Environmental Opportunities. These conversions could be as simple as discussing sweeping the street to insure dust was minimal with a person doing said activity. A supervisor could then right up the same conversation for each person on-site, yet he or she may have not discussed dust risk with all the crew.

## CURRENT ELG

Today, the ELG continues to meet in order to preserve the experiences learnt from the earthquakes and to continue to improve environmental practices in Christchurch. The 5 DT's of SCIRT remain in the ELG, as well as CCC representatives. Periodically the Regional Council comes to quarterly meetings. Specialists are also invited to provide insight on various changing policies or methods for environmental practices.

A key milestone completed by the ELG was authoring the Civil Contracts Environmental Guide (CCEG) published by Contractors NZ (Civil Contractors NZ, 2017). The CCEG is a key tool that can be used in the civil construction industry, along with many other lessons learned of SCIRT, for the future generations of construction.

## CONCLUSION

In summary, the ELG was formed within SCIRT's framework in order to manage the environmental aspects of the 2010/2011 earthquake recovery. Using key tools including EMS, Minimum Standards and a comprehensive auditing system 5 construction companies formed a collaborative group that broke down commercial sensitivity. This knowledge and experience continues to feed into the industry via sub-contractors and continued ELG assemblies. The CCEG will continue to provide ELG's learning's into the future of civil construction.

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## APPENDIX A – TERMS OF REFERENCE

[May 2014] Terms of Reference - SCIRT ELG

**Goal:** To support Delivery Team Leaders and staff to collaboratively achieve better environmental management that will reduce the environmental footprint of the infrastructure rebuild by lifting the game of the construction industry.

- Develop a culture where environmental management is an individual and collective responsibility.
- Proactively identify opportunities for improvement through encouraging reported incidents, near misses and hazards, and through conducting regular audits.
- Continually enhance environmental management techniques and meet or exceed existing standard operating procedures through innovations, sharing and cooperation.
- Achieve compliance by ensuring single point accountability for meeting resource consents on each project.
- Up-skill site crews in environmental awareness and environmental management practices.

### **Our Performance Objectives are:**

To develop environmentally aware people who proactively identify environmental incidents, opportunities and initiatives in the field, and act on them.

Eliminate Environmental non-compliance events.

Promote innovative and sustainable construction practices which add value to the rebuilding of Christchurch.

### **We all agree to:**

- Participate in regular meetings with representatives from each delivery team.
- Be generous with trust (we share openly)
- Listen actively
- Work collaboratively for the benefit of the people of Christchurch
- Lead by example
- Have honest conversations
- Encourage and support one another with the common challenges we face
- Commit to completing assigned tasks that contribute to the ELG's goals

### **ELG Membership**

Membership will include up to two representatives from each Delivery Team, the IST, SCIRT owner participant organisations and the Tactical Leadership Group.

Occasionally visitors will be invited to attend all or part of an ELG meeting, including guest speakers, regulators, other technical specialists or stakeholders. These visitors do not have any influence on ELG decision making.

## **Roles and Responsibilities**

### ***Host and Chair***

The hosting and chairing responsibility will be rotated between the members.

### ***Taking Minutes***

The minute taking responsibility will be rotated between the members. Minutes should be distributed within three working days of the meeting. If a scheduled minute taker cannot commit to distributing minutes within three days, they should arrange to swap with someone else.

### ***Reviewing Minutes***

Actions arising from previous minutes will be reviewed at the next meeting. The previous minutes will be accepted unless a change is proposed.

### ***Agenda***

The agenda will be prepared by the IST Environmental and Planning Coordinator, with input from ELG members. The agenda will be circulated at least two days prior to the scheduled meeting.

Team members agree to be mindful of the allocated time and strive to stay on topic. Additional matters for discussion should be added to the agenda prior to the meeting, or left to 'other matters' at the end of the meeting, or replace an existing agenda item by agreement from the group.

### ***Decision making process***

Our decision making process aims to deliver wise and pragmatic business outcomes.

## **Process for team decisions**

- Decision making at ELG meetings will strive firstly for consensus, and then will use simple majority if consensus is not possible. Simple majority means that each delivery team and IST is entitled to one vote each.
- We acknowledge that consensus may not always be possible, and agree to commit to the group decision, provided it is workable for each company. If there is significant disagreement, the decision may be escalated to the IST SQE Manager or the TLG.
- There must be representatives from IST and at least four delivery teams to make a decision in the ELG meeting. If a delivery team fails to send a representative, they agree to commit to group decisions made in their absence.

## **Differing responsibilities for decision making**

- ELG team decisions include those relating to the implementation of strategies to achieve the projects overall goals.
- IST staff may need to make decisions that are informed by the ELG, and not made by the ELG. This may include reporting to the Board, and decisions relating to the project's overall goals and strategies. IST staff commit to informing the ELG as soon as possible in the course of the discussion if this is the case. IST also commits to clearly representing such decisions as informed by ELG discussions, and not necessarily endorsed by the ELG.



## APPENDIX B – EXAMPLE EMS

### Example SCIRT Environmental Management System

SCIRT Environmental Management Plan	DT Environmental & Sustainability Policies
SCIRT Tree Management Plan	Project Development, Controls and Approvals Register
SCIRT Archaeological Management Plan	Construction Execution Procedure (Methodology)
SCIRT Minimums Standards (Appendix D)	Health Safety and Environmental Risk Register
Job Safety and Environmental Analysis	Environmental Protection Instructions (Contaminated Land, Erosion and Sediment, Waste Management etc.)

### Construction Environmental Management Plan:

Sub plan – Sustainability	Sub plan – Vibration
Sub plan - Erosion and Sediment Control Plan	Sub plan – Dust
Sub plan – Spill Management Plan	Sub plan – Noise
Sub plan – Water Monitoring Plan	Sub plan – Dewatering
Sub plan - Archaeological	Sub plan – Vegetation Impacts
Sub plan – Chemical, Fuel and Oil Management	Sub plan – Construction Waste
Sub plan – Contaminated Land	

### Environmental Forms & Templates:

Dewatering Observations  
 Noise Recording  
 Vibration Levels & Movement Monitoring  
 Aquatic Animals (in Dewatering / Cofferdam areas)  
 Invasive plants / weed – *Lagorsiphon* and Didymo (clean plant / machinery / boats / floating devices / boots etc.)

Incident / Near Misses

### Project Reporting:

SCIRT – monthly report

Regional Council

City Council

Archaeology & Heritage

### Trainings/Toolboxes:

Induction + New Recruit ENVR Briefing  
 Spill Response Training  
 Dewatering and the Environment Training  
 Archaeological Briefing

Working around Protected Trees Training

Toolbox Talks on weekly issues and positive situations

### Site Checks and Audits:

Pre Starts, Site Report Cards (See, Say, Do)  
 Change Management Cards (START Cards)

Weekly Site Checks

Monthly Audits, SCIRT Quality Audit and Visiting Manger Audits

Site visits by Environmental Personnel

## Minimum standards for key environmental risks



### Trees

- All tree removals require an Arborist Report and notification to the Community Board one month in advance of works commencing.
- All projects with potential tree conflicts are to have a pre-start site walkover with the SCIRT Arborist to identify tree conflicts and to agree and minute reasonably practicable controls. Controls being;
  - Excluding trees from the work site
  - Redesign and re-alignment of works to avoid conflicts
  - Identifying pruning requirements
  - Identifying tree protection requirements (e.g. tree mats, fencing)
  - Identifying times for supervisor arborists to be on site.
- The Corridor Access Request application must be submitted to CCC with a GIS image or plan, annotated with locations of work within the tree setback, and agreed pruning, fencing, and standover arborist requirements.
- No stockpiling of materials under drip zone of trees (unless on existing hard stand).



### Archaeology and Heritage

- All crews are to be aware of the Accidental Discovery Protocol.
- All crews working in high or medium risk areas must attend an archaeological site briefing.
- Pre-start notifications for work in high or medium risk areas to be submitted to the Archaeologist, Rūnanga and CCC Heritage Advisors 10 days prior to works commencing. The Project Manager or Site Engineer is to have a pre-start discussion with the archaeologist to identify site specific requirements.
- Contact details must be available on site for the site Archaeologist and CCC Heritage Advisor (where working near heritage buildings, places or objects).
- Archaeological Authority, Heritage Consent and Temporary Protection Plan to be on site during construction works.



### Spills

- A spill response plan with correct contact details for Site Engineer, Pollution Hotline and Environmental Advisor must be displayed on site.
- All site crew must have attended spill kit training within the last 12 months.
- A 200L spill kit is required on all work sites. Smaller sized kits are permitted with approval from the Environmental Advisor depending on the nature of the work site.
- If working within 50m of a waterway a 200L marine spill kit (or 200L oil only spill kit plus floating booms) and deployment plan is required. The Site engineer and crew are to work out the best place for deployment of a floating boom before starting works, mark this location on a map and have that map on display in the site office/ container.
- Spill kits to be located on the work site and safely accessible within 3 minutes.
- All site work vehicles/utes to have 40L spill kits.
- All sites within 20m of a waterway or open excavation must utilise a drip tray to intercept any spills from fuelling/decanting activities.
- All chemical storage areas are to be bunded.

# Minimum standards for key environmental risks



## Wastewater Overflows

- Plan the project to avoid Wastewater Overpumping whenever possible; if not possible then conduct as per the SCIRT Wastewater Overpumping Best Practice Guide.
- Obtain a CCC Permit to Work and complete pump set-up information sheet and plan; keep copies of all on-site.
- Assess the risks of overflow on each site and install appropriate controls as per the Wastewater Overpumping Flowchart. The Environmental Advisor shall review and approve the risk assessment and controls.
- Plan for the possibility of overpumping failure or overflow. Refer to Wastewater Overflow Response Plan.
- Isolate overpumping set-ups, by fencing with panels securely attached together and the entrance padlocked. The overpumping set up is to be wholly contained within the fenced area if possible, and car ramps over pipes are to be used if needed beyond the fenced area.
- Record monitoring and security checks of overpumping, and have float and/or flow alarms installed in accordance with the Wastewater Overpumping Flowchart.



## Sediment Discharge

- Pre-start notifications to Environment Canterbury are to take place before dewatering activities commence.
- All dewatering requires at least one sediment control system. An oil water separator is required to be installed if dewatering in a high or medium risk dewatering zone.
- No dewatering discharge is to cause erosion or scouring.
- No dewatering discharge to HAIL sites and no dewatering discharge from HAIL sites to land is to occur. All dewatering to land discharges require landowner and Environmental Advisor approval prior to discharge.
- All dewatering activities to have 2hr recorded visual checks for signs of contamination, odour and discolouration/sediment load.
- No discharge of dirty water (TSS >150g/m<sup>3</sup>) is to occur to stormwater or water bodies. Dirty water being defined by the use of a Total Suspended Solid Meter, sample jars/visual clarity jars/fingertip test, or use of scale ruler. Consult with your Environmental Advisor for more information on these methods.
- Do not discharge trench pumping water to the stormwater network, unless there is good sediment treatment (TSS <150g/m<sup>3</sup>) and frequent monitoring (< 30 minute intervals).
- Protecting all stormwater sumps that may receive runoff from your site before starting work. Check daily and maintain as required.
- Keep stockpiles to a minimum on site.
- Keep stockpiles away from kerb and channel or install kerb drainage.
- If heavy rain is forecast bund or cover stockpiles and remove sump protection to reduce the risk of flooding.
- Isolate stockpiles from dewatering water and stormwater. Use a bund or pull them back from the water flow.
- Have an erosion and sediment control plan in place and establish controls around disturbed areas where sediment has the potential to enter waterways or drains.
- Check all sediment and erosion controls weekly and after heavy rain and maintain as required.

APPENDIX D – QUALITY OF AUDIT ASSESSMENT

ASSESSMENT GUIDE - Criteria for measuring KRA 5.3



Quality of Environmental Audit – Assessment

Explanatory Notes:

The purpose of this audit is for measurement against the Environmental Assurance KPI. Once per month, IST will randomly select one site from each Delivery Team to audit against the below criteria. This audit looks at the quality of environmental auditing by site staff, and site environmental ownership and leadership. The delivery team is required to provide the most recent monthly audit performed by site staff for the site selected by IST.

A guide to the scoring criteria is set out below. A range is provided to allow for significance to impact the score.

Project #	Project Name:
Delivery Team:	Main Contractor:
Assessment Date:	Other contractors onsite:
Assessment Completed by:	Overall Score %

Area of Assessment	Weighting	Criteria for Allocation of Score (S.M.A.R.T)	HOW IS IT SCORED? EXAMLES/GUIDANCE
Quality of the audit and recommendations.	30%	Clear evidence of verification against the audit questions = 15%	Review of audit form -2 to -5 points per corrective action depending on significance, if audit does not contain corrective actions where it should. -5 points if there is minimal evidence of verification against the audit questions (e.g. few comments). -10 points if there is no evidence of verification against the audit questions (e.g. no comments).
		Audit contains corrective actions that are specific, attainable, relevant and time-bound recommendations = 15%	Review of audit form -5 points per criteria if corrective actions are not specific, attainable, relevant and time-bound. (ELG Note: Quality of corrective actions, deleted above, can be accounted

*(Monthly assessment of Delivery Teams on-site environmental auditing, reviews undertaken randomly by the Integrated Services Team (IST) will consider behaviours, leadership and close out of actions)*

SCIRT IST – Internal check for Delivery Teams  
Version 1- Issued 5 July 2013



Site crew have environmental ownership of site (what does it look like today?) (Yes/No) = 20 / 10%			
<b>Frequency of Audits</b>	10%	1 audit per month? (Yes/No)	Seek evidence that audits are being carried out once per month. Copies of the last 3 months audits should be accessible. Score guide: 0 – No audits accessible in the last 3 months, 5 – 2 audits available in last 3 months, 10 – one audit per month for last 3 months.
<b>100%</b>		<b>Total</b>	

**Auditor's comments:**

Include any further explanations to scoring, and any recommendations for improvement.

*(Monthly assessment of Delivery Teams on-site environmental auditing, reviews undertaken randomly by the Integrated Services Team (IST) will consider behaviours, leadership and close out of actions)*

**SCIRT IST – Internal check for Delivery Teams  
Version 1- Issued 5 July 2013**

## APPENDIX E – MONTHLY AUDIT EXAMPLE





MONTHLY ENVIRONMENTAL AUDIT



PROJECT NAME:	PROJECT NUMBER:	DATE OF INSPECTION:	TIME INSPECTED:
SITE LOCATION:		CONTRACTOR:	

INSPECTED BY:	POSITION: PROJECT ENGINEER
CONSULTED WITH (SUBCONTRACTOR REPRESENTATIVE):	POSITION:
CONFIRMATION THAT THE INFORMATION PROVIDED IN THIS AUDIT HAS BEEN REVIEWED BY:	
ENVIRONMENTAL TEAM	DATE:
CONFIRMATION THAT ALL THE CORRECTIVE ACTIONS IN THIS AUDIT HAVE BEEN CLOSED OUT	
CONSTRUCTION MANAGER	DATE:
HSE MANAGER	DATE:

It is the responsibility of the McConnell Dowell Construction Manager to ensure all Corrective Actions have been closed out by the due date provided in this audit

NOTE 1: A McConnell Dowell Construction PROJECT ENGINEER to carry out this inspection.

NOTE 2: Subcontractor and employee representatives are to participate in inspections for their relevant areas.

NOTE 3: Names of personnel participating in inspections are to be noted above.

CLOSE OUT - the close out date of CORRECTIVE ACTIONS is monitored by MCD Central Database.

**RECORDS & DOCUMENTATION - Aim is to confirm proper planning and communication is occurring**

	QUESTION	VERIFICATION DESCRIPTION REQUIRED	VERIFICATION	COMMENTS AND CORRECTIVE ACTION	Owner	Action by date	Close out date
1	Is the CEP still environmentally current, relevant to the work undertaken and signed?	Note: have any modifications to the work practises that effect the environment e.g., modified the dewatering method or new procedures been implemented? If so note that a new CEP will be actioned and what has changed.					
2	Is the JSEA still environmentally current, relevant to the work undertaken and signed?	Note: have any modifications to the work practises or procedures been implemented? Does the JSEA reflect these approved changes? Check who has signed on to this document i.e., all on site <i>MUST</i> have signed it. <b>Make a comment.</b>					
3	Are all relevant Environment Consents available on site?	Note: the location of the consents. Check all those listed in the CEP are on site.					



	QUESTION	VERIFICATION DESCRIPTION REQUIRED	VERIFICATION	COMMENTS AND CORRECTIVE ACTION	Owner	Action by date	Close out date
4	Is the project specific ERA Map printed in colour and displayed on site?	Note the location of the ERA map or if it is missing. Check it is specific to the site. If it cannot be displayed on site explain why. (Environmental Risk Assessment Map is GIS layers on LLUR, Trees, Archaeology, HAIL GW, heritage)					
<b>SPILLS - AIM IS TO CONTROL ANY SPILLS FROM HYDROCARBONSTO EMULSION</b>							
5	Is the spill response plan displayed on site? - does it contain the correct contacts relevant to that site?	Note location of spill response plan. Check contact details for McConnell Dowell staff are accurate.					
6	Is there a 200L spill kit on site and fully Stocked? If the site is within 50 metres of a waterway is there also a 200L marine spill kit on site and fully stocked?	Note type, size and location of spill kit/s on site. In exceptional circumstances a 200L kit may not be required but this needs pre-approved by the Environment Team.					
7	Is there evidence of concrete run-off reaching stormwater drains?	Confirm if concrete work is occurring. If YES, then note where is the run-off is being directed to?					
8	Is there any evidence of spills that have not been contained or cleaned up? Check spills have been appropriately reported to the Environment Team.	Note the evidence of the spill and its location. Any spill to water or stormwater must be reported to the HSE Mngr. Spills to land that are greater than 5L must be reported to HSE Mngr					
9	Does Plant and Equip show any visible oil and/or hydraulic fluid leakage ?	If YES, note the: plant/equip the extent and type of leak, oil or fluid how the leak was dealt with What plan they have to fix leak					
<b>SEDIMENT AND EROSION CONTROL - AIM IS TO KEEP AS MUCH OF THE DIRT, (YOU DIG UP OR MOVE), STAYING ON THE SITE</b>							
10	Do the stormwater sumps, that are likely to receive run-off from site, have suitable protection (witches hats/ geotextile) and these are maintained?	Confirm what protection is being used and its condition. If heavy rain is occurring or forecasted has SW protection been removed to reduce risk of flooding?					
11	Are kerbs and channels free of sediment and debris?	Note the condition of kerb and channels.					
12	Is the crew aware of the spill response plan and what to do in the event of a spill?	Ask the crew or crew member what they would do in the event of a spill. Note down here their response.					
13	Is the site entry and adjoining roadway free of sediment?	Note the condition of adjoining roadway and if it needs to be swept.					

	QUESTION	VERIFICATION DESCRIPTION REQUIRED	VERIFICATION	COMMENTS AND CORRECTIVE ACTION	Owner	Action by date	Close out date
14	If the work site is within 50m of a waterway, is the receiving environment free of silt or sediment from our works?	Note the state of the receiving environment (waterway) and whether OUR works having a negative impact on waterway					
15	Are stockpiles stored AWAY FROM the kerb & channel and stormwater paths. If not has Lay-Down Pipe been placed beneath the stockpiles ?	Note the location, number and size of stockpiles on site. Are they stored appropriately. Note: in exceptional circumstances stockpiles may be in K&C but pulled back at end of each day.					
16	Are there any stockpiles to be left out during rain events ?	If YES, then are the stockpiles covered or not? Note what sediment control is in place or if it is lacking.					
<b>AIR AND DUST MANAGEMENT - AIM TO MINIMISE OUR IMPACT ON THE AIR QUALITY OF OUR NEIGHBOURS</b>							
17	Are their odorous smells on site?	Note if odour is an issue on site, what's been done and checked with ET?					
18	Is visible exhaust gas/smoke continuous for more than 10 seconds?	Note if it is and then check when machine was last serviced. Discuss with foreman solution to reduce ongoing visible exhaust.					
19	Is dust suppression required on site? (Is there a high risk of dust from your site?)	If YES, note dust suppression methods and if it is effective?					
<b>NOISE AND VIBRATION - AIM TO KEEP NOISE TO A MINIMUM AT ALL TIMES, SO AS NOT TO DISTURB OUR NEIGHBOURS DURING THE DAY... AND ESPECIALLY AT NIGHT</b>							
20	Are all works restricted to the specified hours of operation?	For Construction, Operating hours are:- 0730- 1800 Mon - Sat Note the Start & Finish times of work crews and days worked. If different CCC must be notified.					
21	Are pumps, generators and fixed machinery situated to minimise noise disturbance to local residents and general public?	Operating hours 0730- 1800. Note: Between 20:00-06:30 the average sound needs to be 45dB (library quiet). Note down location of noise generating equipment.					
22	Are there any other excessive noise or vibrations generated from site activities? (e.g. Sheet Piling)	If YES, what effective sound barriers been put in place? Note: Between 20:00-06:30 the average sound needs to be 45dB (library quiet).					
23	Have ANY noise complaints been received?	Check with Communications Team. If YES, note what has been done to address the complaint? And has it been logged as an incident?					
<b>WASTE MANAGEMENT - AIM TO KEEP OUR SITES TIDY, TO MINIMISE WASTE, TO DISPOSE OF HAZARDOUS MATERIALS SAFELY</b>							
24	Are all hazardous materials going to a registered landfill?	Note the name of disposal location and contractor collecting cleanfill. Sight receipt or get written evidence from contractor and note the date.					

	QUESTION	VERIFICATION DESCRIPTION REQUIRED	VERIFICATION	COMMENTS AND CORRECTIVE ACTION	Owner	Action by date	Close out date
25	Is all cleanfill material going to a registered cleanfill?	Note the name of disposal location and contractor collecting cleanfill. Sight receipt or get written evidence from contractor and note the date.					
<b>CONTAMINATED LAND: Resource Consent RMA92020520</b>					<b>Cat = Category</b>		
26	Are excavations occurring in or adjacent to a Cat 1, Cat 2 or Cat 3 LLUR Site?	Check your ERA Map and note the Category the excavation is occurring in. (Cat 1 = In a LLUR Site, Cat 2 = Adjacent to a LLUR site, Cat 3 = All other areas.)					
27	Has the Contaminated Land briefing been delivered by a trained person (completed 2hr course)	Check the attendance register for the briefing and note the date. Check any new people joined the site have been briefed. Ask the crew or a crew member what signs of contamination they are looking for and note down here their response.					
28	If excavating in Cat 1 or Cat 2 is the LLUR Monitoring sheet being completed daily?	Note when this was last completed and where it is stored on site.					
<b>TREES: Resource Consent RMA92019127 Note: Heritage trees needs require separate resource consent work within 10 metres.</b>							
29	Has an Arborist conducted a walk through prior to site works conducted during the ECI and/or the CAR phase?	Check ERA Map. If NO, then mark this section N/A. If YES, Note which type of PROTECTED trees are on site and where they are located. Notable Trees works must be 10 m away.					
30	Have all trees been identified on the ERA?	If YES, Check the ERA. Has the arborist been to site to inspect and have their requirements been confirmed in a written report or email. Sight copy of Arborist written information.					
31	<b>Street Trees/SPRZ/Park Trees:</b> Are there works within the <i>drip line</i> ? If so have the outcomes of the arborist visit been confirmed in writing?	If YES, Note dates of Arborist's visits and confirmation of correspondence. Is there a Supervisory Arborist on site? Sight copies of Arborist's written information.					
32	<b>Street Trees/SPRZ/Park Trees:</b> Is the Drip line fenced off and no storage of materials under drip line?	Note if trees have been fenced off and materials stored appropriately if not why?					
<b>HERITAGE: Resource Consent RMA92022494</b>							
33	Are there any heritage items (or areas) on site?	Check ERA Map. If NO, then mark this section N/A. If YES, note location and item.					
34	Have the Council Heritage Team been notified of at least 5 days before upcoming work around heritage items?	Note date of last correspondence with Heritage Team.					
35	Have heritage items been protected from disturbance?	Note the protection that is in place to protect heritage items?					

	QUESTION	VERIFICATION DESCRIPTION REQUIRED	VERIFICATION	COMMENTS AND CORRECTIVE ACTION	Owner	Action by date	Close out date
36	Have all heritage items been photographed prior to being removed or work commencing?	Note who and when the items were photographed and if they've been removed note who is safeguarding the items?					
<b>DEWATERING: Resource Consents CRC121310 &amp; CRC121311</b>							
37	Is there Dewatering or the potential of dewatering on site and has the EA Team been notified?	If YES, Note last recorded observation and if it is being done every 2 hrs or as defined in JSEA.					
38	Is the dewatering monitoring sheet being completed every 2 hours or as defined in the JSEA?	Note: Check dewatering discharge against hand behind jug of water or with TSS meter. Note the condition of the sample, including smell. If at anytime the water was or suspected to be >150mg/L have ET been informed and what action is /was taken to improve the quality.					
39	Is the dewatering discharge going to sewer?	If YES, then Check there is written permission on site from CCC.					
40	Is the dewatering discharge going to land? Sight evidence there is landowner permission.	Note: it cannot be greater than 10 cubic metres; no overflow into neighbours or water body; no ponding for more than 2 hrs; not onto or from a LLUR site.					
41	Is the sediment tank <1/3 full of sediment?	Note when was the sediment tank last cleaned out? Who is responsible for monitoring this?					
<b>Stand Pipes</b>							
42	Are all standpipes in use on site CCC approved?	Note if the standpipe is CCC approved ? E.g. has been painted Blue. Note the number on the standpipe and the crew it is issued too.					
43	Has the meter been read and standpipe serviced within the last 3 months?	Note the date of the last service and due date of next service.					
44	Is the standpipe on the Standpipe Register?	Note: Enter the CCC standpipe on the Equipment Register in G Drive/Quality/Equipment.					
<b>WASTEWATER OVERPUMPING - Aim no sewage / wastewater discharged or spilt to land , stormwater or waterway.</b>							
45	Has a CCC "Permit to Work" been issued prior to starting overpumping?	if there is not WWOP place N/A in this section. If YES, Note the number of permit to work and issue date. Does it still cover the activity?					
46	Are the Sewage Overpumping Set-up information sheets and maps available on site?	Note location and accuracy of these Set-up sheets and Map as it is critical that security and other contractors have access to that information.					

	QUESTION	VERIFICATION DESCRIPTION REQUIRED	VERIFICATION	COMMENTS AND CORRECTIVE ACTION	Owner	Action by date	Close out date
47	Have the Set-up information sheet and maps been reviewed in the last month?	Note when the Setup Information Approval sheets were last reviewed. If > 1 month, this will need to be reviewed and updated.					
48	Is Wastewater Overpumping covered in the JSEA?	Note: If not in the JSEA, then this will need to be updated.					
49	Is the crew aware of the Sewage Overflow Response Plan? Including location of SW outlets?	Ask a crew member what they would do in the event of a sewage overflow. Note their response and if training required.					
50	Are "15-15" Wastewater Overpumping Check sheets being completed every day?	Check if 15-15 Inspections are being completed, note who is responsible for this? Where they are being stored?					
<b>ROADING - SEALING</b>							
51	Was the weather checked prior to commencing sealing?	Note done were 3 days of dry weather forecast prior to chip sealing commencing?					
52	Is an Emulsions Spill kit available on site?	Note the location of emulsion spill kits (grey or yellow spill kit pads)					
53	Is the crew aware of what to do in the event of an emulsions spill or run-off event?	Ask a crew member what they would do during an emulsions spill and note their response and if training required.					
54	Are all stormwater sumps protected from emulsions run-off?	Note what protection is in place on the stormwater sumps?					
<b>WORKING IN OVER OR AROUND WATERWAYS &amp; BRIDGES: Resource Consent CRC 146620</b>							
55	Has the Harbourmaster been notified of any obstructions in the waterway or river closures?	If YES, Note the date and time that Harbourmaster was notified of river closure or obstructions in the waterway.					
56	Has Ecan been notified of works?	If YES, Note the date and time that Ecan was notified of works in a waterway. If NO, Contact you EA and supply CEP, JSEA, and ESCEP.					
57	Are the appropriate erosion and sediment control measures in place as per the <i>Erosion Sediment and Environment Control Plan (ESCEP)</i> ?	Note the condition of the Controls in place. Are there any changes required to the <i>ESECP</i> , if YES contact EA to see if Ecan needs to be notified of a scope change?					
58	Where is machinery being washed down and refuelled and is there a fuel drip tray on site?	Check that Machinery is not washed down on banks of waterway, and are not being refuelled within 20 m of a waterway and are clear of plant seeds. Note down where they are doing these activities.					
59	Is all fuel stored securely or removed from site overnight?	Note where is fuel stored on site during the day and overnight?					
60	Are works occurring in trout spawning season? (1 May - 31 Oct)	If YES, Note the location of the evidence of permission from ECan and Ecologist report.					

	QUESTION	VERIFICATION DESCRIPTION REQUIRED	VERIFICATION	COMMENTS AND CORRECTIVE ACTION	Owner	Action by date	Close out date
61	Are works preventing passage of fish or causing stranding in pools or channels?	If YES, Note any obstructions that are affecting fish passage? What plans are in place to fix this ?					
<b>ARCHAEOLOGY - Maori &amp; Pakeha: Global Authorities 2012/320eq &amp; 2013/580eq</b>							
62	Is the crew aware of the Accidental Discovery Protocol?	Ask a crew member what they would do if they found something they think is potentially archaeologically significant. Note down here their response.					
63	Have any items of cultural (Maori or Pakeha) significance been identified and reported?	If YES, then what were they and when were they reported ?					
64	If working in High Risk: Have all the crews been briefed by the Project Archaeologist?	Note the date of Archaeological briefing. Note who attended from the work crew and any special requirements from archaeologist ?					

**Additional hazards, observations observed by the Auditor not identified on the Pre Start or Hazard Board**

	TYPE (HAZARD, OBSERVATION)	DESCRIPTION	COMMENTS AND CORRECTIVE ACTION	OWNER	DATE ACTION	Close out date

**Closing Comment by the Auditor if you want .....**



# Breaking Down Commercial Sensitivity: Stronger Christchurch Infrastructure Rebuild Team (SCIRT) & the Environmental Leadership Group (ELG)



# James Skurupey, MSc ENVR MEIANZ CEnvP





# 2010 & 2011 Christchurch Earthquakes



city care

Downer

Fletcher

Fulton Hogan

McCONNELL  
DOWELL  
CREATIVE CONSTRUCTION



# Collaborative approach



Breaking down commercial sensitive by:

1. Establishing Trust and Commutation through Terms of References
2. Combined effort on achieving the ELG's Objectives
3. Sharing our Initiatives and Lessons Learned, both positive and negative
4. Developing Best Practice documents and training on implementing best practise on Key Risks identified in an adaptive management approach
5. Developing an auditing program that provides
6. The Legacy of the ELG

# Terms of Reference



## *Reviewing Minutes*

Actions arising from previous minutes will be reviewed at the next meeting. The previous minutes will be accepted unless a change is proposed.

## *Agenda*

### [May 2014] Terms of Reference - SCIRT ELG

**Goal:** To support Delivery Team Leaders and staff to collaboratively achieve better environmental management that will reduce the environmental footprint of the infrastructure rebuild by lifting the game of the construction industry.

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### [May 2014] Terms of Reference - SCIRT ELG

**Goal:** To support Delivery Team Leaders and staff to collaboratively achieve better environmental management that will reduce the environmental footprint of the infrastructure rebuild by lifting the game of the construction industry.

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or the TLG  
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stative, they agree

- Develop a culture where environmental management is an individual and collective responsibility.
- Proactively identify opportunities for improvement through encouraging reported incidents, near misses and hazards, and through conducting regular audits.
- Continually enhance environmental management techniques and meet or exceed existing standard operating procedures through innovations, sharing and cooperation.
- Achieve compliance by ensuring single point accountability for meeting resource consents on each project.
- Up-skill site crews in environmental awareness and environmental management practices.

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te ELG as soon as  
mits to clearly  
necessarily

## **Roles and Responsibilities**

### *Host and Chair*

The hosting and chairing responsibility will be rotated between the members.

### *Taking Minutes*

The minute taking responsibility will be rotated between the members. Minutes should be distributed within three working days of the meeting. If a scheduled minute taker cannot commit to distributing minutes within three days, they should arrange to swap with someone else.

# ELG Objectives



- 1.** To develop environmentally aware people who proactively identify environmental incidents, opportunities and initiatives in the field, and act on them.
- 2.** Eliminate environmental non-compliance events.
- 3.** Promote innovative and sustainable construction practices which add value to the rebuilding of Christchurch.

# Innovations



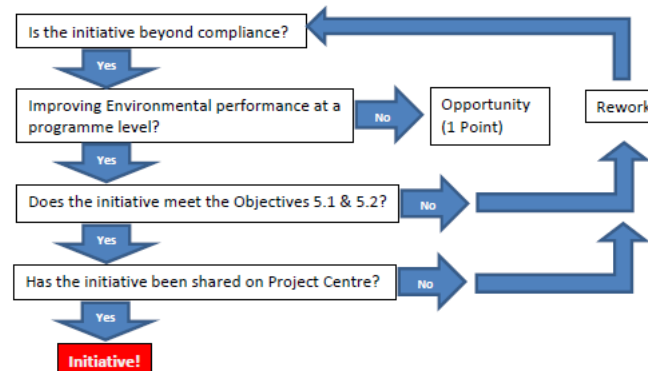
## Memorandum

Email: [Grant.Anderson@scirt.co.nz](mailto:Grant.Anderson@scirt.co.nz)

To	Environmental Leadership Group
From	Grant Anderson
CC	Greg Slaughter, Anita Collie, Sarah Fitzgerald
Date	31.10.2012
Subject	Environmental Initiatives

Thanks for coming along to agree a process on what is considered an environmental initiative. I hope that this will eliminate any 'popularity contests', and ensure that initiatives are aligned with meeting our objectives as outlined in the KRA.

The gateway test is outlined as follows:



5 Points are awarded when an "Initiative" is reached through the process outlined above. If another delivery team adopts your initiative you can collect one point (upon adoption), and the adoptee also collects one point. This is to encourage sharing of good ideas.

Sensibility checks on initiatives will be performed by Grant Anderson when they come through ProjectCentre (as an impartial judge!).



# Lessons Learnt



**Lesson Learned: Incorrectly marked "abandoned" wastewater lines**

**Background:**

As part of the stormwater outfall works on SCIRT Project 11109 (Southshore), the crew had to excavate a trench. Within this trench was a pressure wastewater line, which (according to the plans) had been abandoned. The line was leaking into the trench. The crew did not know that the line was still active and the water in the line was being pumped by PS 55.

As the pipe was marked as abandoned on the drawings, there was no smell and the water was running clear, the crew assumed the water was groundwater infiltration of the abandoned pipe. Steadily the crack widened and the water started to flood the excavation. The crew decided to take the top off the pipe and insert bungs to stop the flow of groundwater. This worked well, and the crew finished work for the day and left the site.

**Outcomes:**

Overnight, the upstream bung let go due to the build-up of pressure. The water flooded the trench and the surrounding intersection.

When the crew arrived at site in the morning they called the City Council regarding the flooding issue. They were advised that the water may be contaminated with wastewater. The crew pumped the water into a wastewater gravity main to empty the trench so repairs could be carried out. City Council deployed a City Care team to turn off PS55 and repair the damaged pipe.

The areas which had been flooded with wastewater were cleaned and disinfected as per normal procedure for a wastewater overflow. Some discharge to the estuary may have occurred overnight, but lab test results indicate that wastewater contamination levels in the estuary were significantly lower than that of the water pooled on the road. It appears that most of the water was contained on the road or in the excavation.

**Lessons Learned:**

The primary lesson from this event is: Treat every service as live. Never assume an abandoned service is abandoned – the drawings may have been marked incorrectly. Confirm with CCC that abandoned wastewater lines are actually abandoned.

Groundwater infiltration of wastewater lines will lead to pump station activation. PS 55 has been running almost constantly for 5 years due to groundwater infiltration, whereas a pump station on an undamaged network will only activate occasionally for short periods of time. The constant flow of water is not typical of a pressure system - this is one reason why the crew assumed the leaking was groundwater infiltration of the abandoned line.

There are other methods of preventing leaking from wastewater lines. In this instance, wrapping the pipe to waterproof it (rather than cutting it open and installing bungs) would likely have avoided this outcome.



# KEY ENVIRONMENTAL RISKS

**Key environmental risks**  
We will deliver an environmentally sensitive rebuild, and minimise our impacts on the environment during and after construction

**Trees**  
Trees are a valuable community asset, providing shade, street amenity, wildlife habitat and improved air quality. We will avoid any unauthorised damage to trees.

**Archaeology & Heritage**  
Archaeology and heritage provide a unique window to the past that cannot be replaced if lost. We will follow the accidental discovery protocol at all times.

**Spills**  
Spills can contaminate land and water, including the drinking water supply. We will always have the right equipment and procedures in place to deal with a spill as soon as it happens.

**Wastewater overflows**  
Wastewater overflows can damage the health of waterways, the environment, workers and the local community. We will ensure all wastewater is kept off the streets and out of the river.

**Sediment discharges**  
Sediment discharges reduce water quality and river health. We will ensure the quality of water is clear when it enters the nearest stormwater sump or waterway.

For more details please see the minimum standards for key environmental risks document

citycare | HDowner | Fletcher | Purvis | MCDONNELL DOWELL | SCIRT  
Thinking Infrastructure

## Minimum standards for key environmental risks



### Trees

- All tree removals require an Arborist Report and notification to the Community Board one month in advance of works commencing.
- All projects with potential tree conflicts are to have a pre-start site walkover with the SCIRT Arborist to identify tree conflicts and to agree and minute reasonably practicable controls. Controls being:
  - Excluding trees from the work site
  - Redesign and re-alignment of works to avoid conflicts
  - Identifying pruning requirements
  - Identifying tree protection requirements (e.g. tree mats, fencing)
  - Identifying times for supervisor arborists to be on site.
- The Corridor Access Request application must be submitted to CCC with a GIS image or plan, annotated with locations of work within the tree setback, and agreed pruning, fencing, and standover arborist requirements.
- No stockpiling of materials under drip zone of trees (unless on existing hard stand).



### Archaeology and Heritage

- All crews are to be aware of the Accidental Discovery Protocol.
- All crews working in high or medium risk areas must attend an archaeological site briefing.
- Pre-start notifications for work in high or medium risk areas to be submitted to the Archaeologist, Rūnanga and CCC Heritage Advisors 10 days prior to works commencing. The Project Manager or Site Engineer is to have a pre-start discussion with the archaeologist to identify site specific requirements.
- Contact details must be available on site for the site Archaeologist and CCC Heritage Advisor (where working near heritage buildings, places or objects).
- Archaeological Authority, Heritage Consent and Temporary Protection Plan to be on site during construction works.



### Spills

- A spill response plan with correct contact details for Site Engineer, Pollution Hotline and Environmental Advisor must be displayed on site.
- All site crew must have attended spill kit training within the last 12 months.
- A 200L spill kit is required on all work sites. Smaller sized kits are permitted with approval from the Environmental Advisor depending on the nature of the work site.
- If working within 50m of a waterway a 200L marine spill kit (or 200L oil only spill kit plus floating booms) and deployment plan is required. The Site engineer and crew are to work out the best place for deployment of a floating boom before starting works, mark this location on a map and have that map on display in the site office/ container.
- Spill kits to be located on the work site and safety accessible within 5 minutes.
- All site work vehicles/utes to have 40L spill kits.
- All sites within 20m of a waterway or open excavation must utilise a drip tray to intercept any spills from fuelling/decanting activities.
- All chemical storage areas are to be bunded.

## Minimum standards for key environmental risks



### Wastewater Overflows

- Plan the project to avoid Wastewater Overpumping whenever possible. If not possible then conduct as per the SCIRT Wastewater Overpumping Best Practice Guide.
- Obtain a CCC Permit to Work and complete pump set-up information sheet and plan; keep copies of all on-site.
- Assess the risks of overflow on each site and install appropriate controls as per the Wastewater Overpumping Flowchart. The Environmental Advisor shall review and approve the risk assessment and controls.
- Plan for the possibility of overpumping failure or overflow. Refer to Wastewater Overflow Response Plan.
- Isolate overpumping set-ups, by fencing with panels securely attached together and the entrance padlocked. The overpumping set up is to be wholly contained within the fenced area if possible, and car ramps over pipes are to be used if needed beyond the fenced area.
- Record monitoring and security checks of overpumping, and have float and/or flow alarms installed in accordance with the Wastewater Overpumping Flowchart.



### Sediment Discharge

- Pre-start notifications to Environment Canterbury are to take place before dewatering activities commence.
- All dewatering requires at least one sediment control system. An oil water separator is required to be installed if dewatering in a high or medium risk dewatering zone.
- No dewatering discharge is to cause erosion or scouring.
- No dewatering discharge to HAIL sites and no dewatering discharge from HAIL sites to land is to occur. All dewatering to land discharges require landowner and Environmental Advisor approval prior to discharge.
- All dewatering activities to have 2hr recorded visual checks for signs of contamination, odour and discoloration/sediment load.
- No discharge of dirty water (TSS > 150g/m<sup>3</sup>) is to occur to stormwater or water bodies. Dirty water being defined by the use of a Total Suspended Solid Meter, sample jars/visual clarity jars/fingerlip test, or use of scale ruler. Consult with your Environmental Advisor for more information on these methods.
- Do not discharge trench pumping water to the stormwater network, unless there is good sediment treatment (TSS < 150g/m<sup>3</sup>) and frequent monitoring (< 30 minute intervals).
- Protecting all stormwater sumps that may receive runoff from your site before starting work. Check daily and maintain as required.
- Keep stockpiles to a minimum on site.
- Keep stockpiles away from kerb and channel or install kerb drainage.
- If heavy rain is forecast bund or cover stockpiles and remove sump protection to reduce the risk of flooding.
- Isolate stockpiles from dewatering water and stormwater. Use a bund or pull them back from the water flow.
- Have an erosion and sediment control plan in place and establish controls around disturbed areas where sediment has the potential to enter waterways or drains.
- Check all sediment and erosion controls weekly and after heavy rain and maintain as required.





# Best Practice Guides



**Stranger Christchurch**  
 1 Magdala Place, Wellington  
 PO Box 9941, Tower Junction, Christchurch 8140

Stronger Christchurch Infrastructure Rebuild Team

**BEST PRACTICE PAPER**  
**COAL TAR PROCEDURE**

**SCIRT**  
 Rebuilding Infrastructure

Stronger Christchurch Infrastructure Rebuild Team  
 1 Magdala Place, Wellington  
 PO Box 9941, Tower Junction, Christchurch 8140

**BEST PRACTICE PAPER: DEWATERING**

**KEY MESSAGES**

- If you're pumping a high volume of water with high suspended solids, know where you're going from (i.e. are you creating a void?)

**SCIRT**  
 Rebuilding Infrastructure

**BEST PRACTICE GUIDE: WASTE WATER OVERPUMPING**

**KEY MESSAGES:**

- Environment Canterbury requires the use of the 'Best Practicable Option' to minimise or prevent harm to the environment. This Guide should be considered the Best Practicable Option for Wastewater Overpumping.
- Plan your job to avoid WWOP - **CLIMATE**
- Design and construct Wastewater Overpumping to avoid failure from wear and tear, traffic and vandalism - **ISOLATE**
- Monitor all wastewater overpumping setups - **MANAGE**
- Know what to do in case of an overflow - **RESPOND**

July 2014 By: AJ SCIRT WWOP Best Practice Guide Version 2

**SCIRT**  
 Rebuilding Infrastructure

Stronger Christchurch Infrastructure Rebuild Team  
 1 Magdala Place, Wellington  
 PO Box 9941, Tower Junction, Christchurch 8140

**BEST PRACTICE PAPER: DEWATERING**

**KEY MESSAGES**

- If you're pumping a high volume of water with high suspended solids, know where you're going from (i.e. are you creating a void?)
- When pumping to keep up with dewatering, it is likely you'll need to add coagulants. These may need to happen simultaneously.
- Know your risk zones and have the appropriate controls in place.

**KEY MESSAGES:**

- Minimise the impact of dewatering on the environment by using the Best Practicable Option (BPO) to minimise or prevent harm to the environment.
- Plan your job to avoid WWOP - **CLIMATE**
- Design and construct Wastewater Overpumping to avoid failure from wear and tear, traffic and vandalism - **ISOLATE**
- Monitor all wastewater overpumping setups - **MANAGE**
- Know what to do in case of an overflow - **RESPOND**

July 2014 By: AJ SCIRT WWOP Best Practice Guide Version 2

## ASSESSMENT GUIDE - Criteria for measuring KRA 5.3

### Quality of Environmental Audit - Assessment



#### Explanatory Notes:

The purpose of this audit is for measurement against the Environmental Assurance KY. Once per month, IST will randomly select one site from each Delivery Team to audit against the below criteria. This audit looks at the quality of environmental auditing by site staff, and site environmental ownership and leadership. The delivery team is required to provide the most recent monthly audit performed by site staff for the site selected by IST.

A guide to the scoring criteria is set out below. A range is provided to allow for significance to impact the score.

Project #	Project Name:
Delivery Team:	Main Contractor:
Assessment Date:	Other contractors onsite:
Assessment Completed by:	Overall Score %:

Area of Assessment	Weighting	Criteria for Allocation of Score (S.M.A.R.T)	HOW IS IT SCORED? EXAMPLES/GUIDANCE
Quality of the audit and recommendations.	30%	Clear evidence of verification against the audit questions > 10%	<p>Review of audit form                      -2 to -5 points per corrective action depending on significance, if audit does not contain corrective actions where it should.                      -5 points if there is minimal evidence of verification against the audit questions (e.g. few comments).                      -10 points if there is no evidence of verification against the audit questions (e.g. no comments).</p>
		Audit contains corrective actions that are specific, attainable, relevant and time-bound recommendations = 15%	<p>Review of audit form                      -5 points per criteria if corrective actions are not specific, attainable, relevant and time-bound. (S.G Note: Quality of corrective actions, detailed above, can be assessed)</p>

(Monthly assessment of Delivery Teams on-site environmental auditing, reviews undertaken randomly by the Integrated Services Team (IST) will consider behaviours, leadership and close out of actions)

SCIRT IST - Internal check for Delivery Teams  
Version 1 - Issued 5 July 2013



#### By 10 items under previous criteria

Review corrective actions closed out. Corrective actions should have a reasonable timeframe for close out. If the actions are not closed out, consideration will be given to the reasons why and the evidence provided in support.

Score = #actions closed out / # corrective actions x 30  
(e.g. 1 / 7 x 30 = 4.3%)

Discussion with crew and review of audit form looking for evidence that the corrective actions have been discussed with the crew. Score guide: 0 - Corrective actions have not been discussed with crew, 5 - corrective actions closed out 10 - corrective actions closed out and evidence provided to show corrective actions closed out. Discussion with crew and site leadership.  
 Score guide: 0 - No understanding of site specific environmental hazards and controls / reliance on environmental advice, 5 - some understanding of environmental hazards and controls, 10 - excellent understanding of environmental hazards and controls.

Auditor assessment.  
 Score guide: 0 - Several major and immediate corrections required on site, 5 - site is acceptable/compliant, some minor corrections recommended that would improve practice, 10 - site is at an excellent standard.

out of site  
= 20%

Some evidence that audits are being carried out since per month. Copies of the last 3 months audits should be accessible.  
 Score guide: 0 - No audits accessible in the last 3 months, 5 - 2 audits accessible in last 3 months, 10 - one audit per month for last 3 months.

Total

ment.

(Monthly assessment of Delivery Teams on-site environmental auditing, reviews undertaken randomly by the Integrated Services Team (IST) will consider behaviours, leadership and close out of actions)

SCIRT IST - Internal check for Delivery Teams  
Version 1 - Issued 5 July 2013

(Monthly assessment of Delivery Teams on-site environmental auditing, reviews undertaken randomly by the Integrated Services Team (IST) will consider behaviours, leadership and close out of actions)

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Version 1 - Issued 5 July 2013





# Summary



Source: <http://www.touchupguys.co.nz/christchurch/christchurch-west/>



# Environmental guide

Providing information and advice to prevent environmental harm and legal consequences

## Guidelines for use

Environmental hazards are divided between three categories:

 <p><b>LAND</b> Trees, Archaeology Contaminated land Vibration</p>	 <p><b>AIR</b> Dust Noise Vibration</p> 	 <p><b>WATER</b> Erosion and sediment control Dredging Works in waterways Hazardous substances Concrete runoff Wastewater</p>
---	--	--

Within each category, tools and technical knowledge are provided to help identify risks and apply the controls required across the three phases of a job:

- site planning
- site preparation
- site works

It is important to check the contract documents to determine which level of Environmental Management Plan (EMP) is required to manage the risk on a job. This guide can be used as a reference point to develop the plan.

Hold discussions with the client and/or person conducting the business undertaking to ensure that all environmental requirements have been considered and recognised, such as resource consent conditions, permits and work methodologies that require approval e.g. works in waterways plans.

The job can then get under way.

Legacy: CCEG



Welcome to the SCIRT Learning Legacy site

### Themes



#### The SCIRT Model (6)

A destructive wave of earthquakes in Christchurch required an innovative, efficient and cost-effective response: a delivery vehicle, named SCIRT, that was capable of managing the huge scale and com

[Browse Theme](#)



#### Governance and Decision Making (4)

SCIRT launched with a self-governing structure.

[Browse Theme](#)



#### Programme Management (14)

Flexibility and well-defined processes were key to the management of the SCIRT programme. The initially unknown scale of damage and funding uncertainties contributed to an ever-evolving scope.

[Browse Theme](#)



#### People and Culture (11)

Thousands of people from a range of disciplines, different backgrounds and from around the world united under the SCIRT umbrella into a high-performance "team of teams" to deliver its massive prog

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#### Communications and Community (12)

Effective communication and engagement with communities post-disaster was critical.

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#### Finance and Business Systems (10)

Having reliable data and information is essential to making the right decisions for an organisation.

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#### Design (17)

SCIRT's design team included individuals seconded from more than 20 consultancies, who worked collaboratively across a remarkable range of projects to ensure a high level of service and outstanding

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#### Construction (13)

SCIRT Delivery Teams and their subcontractors were united in creating innovative solutions that ensured value for money and a remarkable range of horizontal infrastructure projects and far reachin

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### About SCIRT

The Stronger Christchurch Infrastructure Rebuild Team (SCIRT) was a virtual team that managed the rebuild of damaged horizontal infrastructure. SCIRT's job was to provide a cost-effective rebuild on its feet.