



MWH

Measuring Environmental Sustainability



SOLID ENERGY
Coals of New Zealand

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- **Primary coal producer in NZ**
- **Previously State Coal (1901)**
- **Currently 7 active mines**
- **Number of rehabilitation projects**



Introduction

- **Why ?**
- **Aims**
- **Method**
- **2003**
- **2004**
- **Achievements**



Why?

Solid Energy Environmental Policy Statement

“A net positive effect on the New Zealand environment through the cumulative effects of our actions”

Aims



- **Standard setting**
- **Impact lowering**
- **Progress tracking**
- **Stakeholder involvement**
- **Transparency**
- **Reputation**

Overall Method

- **Environmental Index**
- **Checks progress against a defined standard**
- **Is tailored to Solid Energy**
- **Reports a single number (target 100+)**

Method – Effects Definition

- Visual Landscape
- Habitat
- Access and Resource
- Infrastructure
- Subsidence and Stability
- Mine Fires
- Land Contamination
- Waste Minimisation
- Greenhouse Gas Emissions
- Water
- Air
- Noise
- Light
- Weeds and Pests
- Blasting
- Rules and Regulations

Method - Setting the Standard

	Identified Effects	0	60	100	150	200
		Significant negative impact	Negative impact	(Neutral)	Positive Impact	Significant positive impact
B	Habitat Impacts	Indigenous and / or rare habitats are destroyed or damaged within the disturbed area such that repair to its previous state is unlikely within 5 years. Usual for mines in ecologically sensitive areas.	Local habitat (ecological or agricultural) are destroyed or damaged such that repair to its previous state is unlikely within 5 years. Usual for mines in agricultural areas.	No, or limited, change to local habitat (essentially equates to zero disturbed area) or at sites where the pre-mining condition had no significant habitat values.	Offsite habitat creation projects for locally common habitat undertaken on sites with no current habitat values, or existing common habitats are enhanced to become rare or highly valued,	Offsite habitat creation or protection projects are undertaken for nationally rare or locally rare habitats, on sites with no current habitat values. (Could be native forest planting in abandoned mining areas)
E	Subsidence and stability	Uncontrolled landslip or erosion has caused notable disturbance to a vegetated or partly vegetated area within the past year (ie: disturbing over 100m ² of vegetation, or over 500m ³ estimated volume) or Unplanned subsidence has had an unforeseen impact on	Land stability issues have been assessed and are creating an unacceptable risk of threatening or impacting on local watercourses or terrestrial habitats or Land stability issues have not been assessed but are thought to be creating an unacceptable risk of	On site landforms are controlled and engineered to minimise risk of uncontrolled land movement or normal, planned subsidence has been mitigated in accordance with approved SEMP requirements.	NA	NA

Weight the Effects

- **Public perception**
 - Visual impact
 - Water quality
 - Habitat disturbance
- **Environmental impact**
 - Land contamination
 - Site GHG emissions
 - Waste management



Weight the Sites

- **Area of land disturbed**
 - Habitat
 - Water quality
 - Land contamination
- **Tonnes of coal produced**
 - Waste
 - Site GHG emissions
- **Population directly affected**
 - Visual effects
 - Air quality

Crunching Numbers

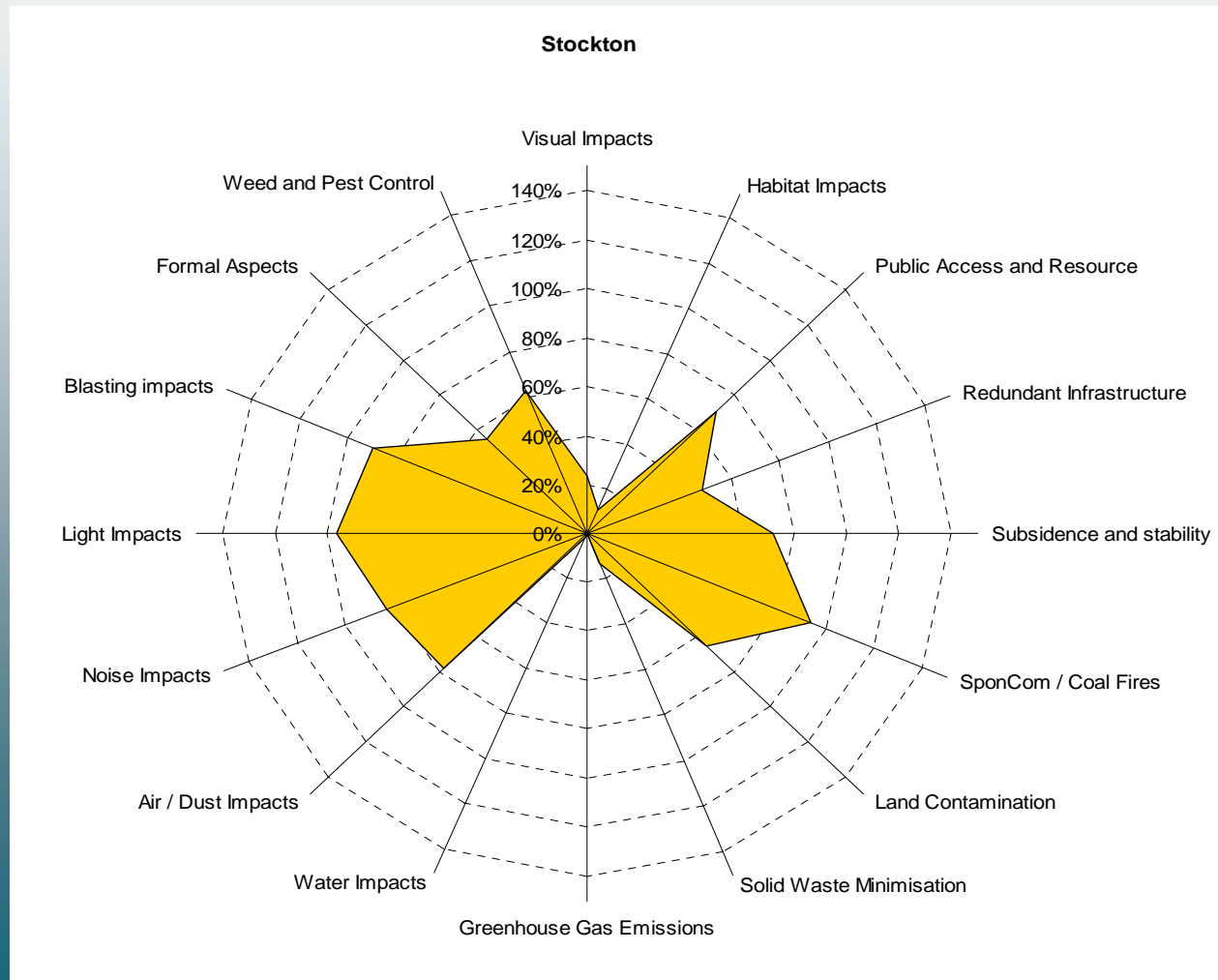
- **Site score**
 - Sum {average score for each effect x effect weighting}
 -
- **Company score**
 - Sum {site score x site weighting}
- **Overall score aims at 100**

2003

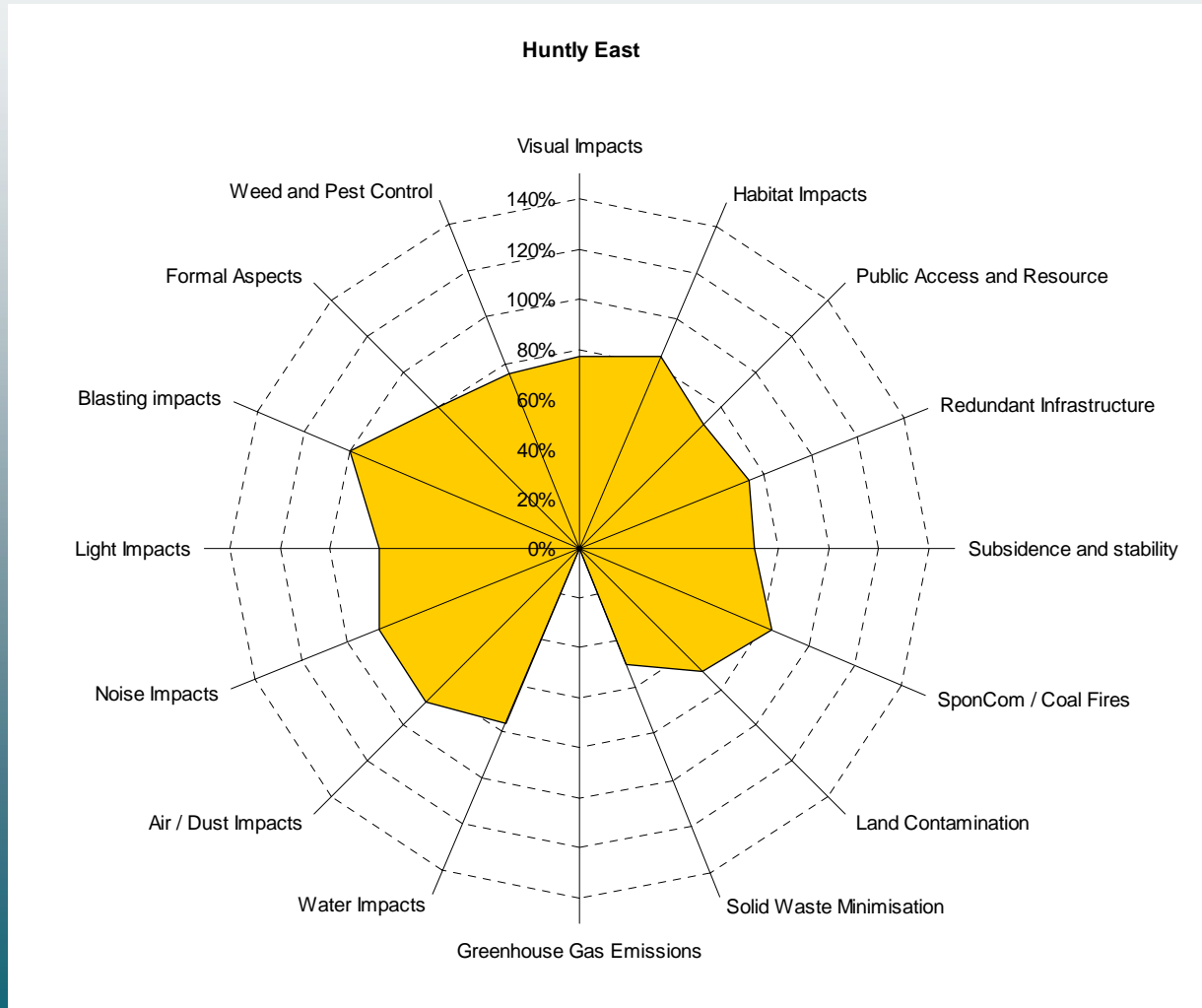
- **Excel application**
- **Solid Energy staff**
- **Consultants**
- **Result 89, from a 110 neutral score (80%)**



2003 Output - Stockton Mine



2003 Output - Huntly East Mine





2004 - Improvements, Descriptions

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Land Contamination

OVERVIEW

Contamination of land through lack of waste control or spillage of hazardous substances leads to a loss of ecological and / or economic value of land. Potential contaminants include:

- Oil, diesel, petrol, lubricating fluids, hydraulic fluid
- Acid/alkali, solvents, paints
- Water treatment chemicals (eg. flocculants)
- Solid waste such as batteries, metals, treated timber
- Power station ash or other third party waste

Site land contamination risks include:

- Migration of spilled substances into groundwater, potentially contaminating surface water, drinking water or stockwater supplies. Contaminants from chronic low volume leakage over time, for instance from vehicle fueling areas, or underground tanks.
- Leachate from disposal areas for site wastes or improved wastes contaminating groundwater.
- Poor storage and handling of fuels, chemicals etc. leading to uncontrolled spills.

When considering the score for site land contamination, you should consider the site as it is NOW (IS/AS/IS) and compare it with what it would be like in the **baseline** condition. (What for sites at DENZ sites would have an uncontaminated baseline condition).

What is your best estimate of the degree of land contamination at this site?

- Uncontaminated**, there has been no contamination at the site or any contaminants are below detectable limits
- Minor contamination**, contamination is detectable by lab equipment in some places but does not have any recognizable environmental impacts or likely environmental risk
- Moderate contamination**, local impacts on vegetation may be apparent in a small area, contamination may be detectable in local streams or groundwater beyond original location of spill, visible to humans, potential risk but no clear impact on fauna
- Major contamination**, involves wider impacts on vegetation and possible impacts beyond the site situated area or site boundary, may affect groundwater or surface water resources making it unsuitable for drinking or irrigation

How much is known about the land contamination status of the site?

- Nothing**, if you have no knowledge relating to land contamination at the site then please leave this score blank and note "don't know" in your comment
- Guesswork**, based on some knowledge of the materials used and waste disposal practices during the active life of the mine, a likely level of contamination may be inferred
- Staff knowledge**, more than one current site staff have been present at the mine for most or all of the active life of the mine and have a good first hand knowledge of the materials used and waste management practices
- Desktop survey / walkover knowledge**, site records and staff interviews have been reviewed to produce a professional report on potential contamination and likely locations
- Intensive survey knowledge**, information to confirm the presence or absence of suspected contamination has been collected by field sampling and laboratory testing methods.



Unbonded barrels, evidence of spillage



Evidence of uncontrolled disposal of wastes



Well bonded tanks help to mitigate risks of land contamination

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Land Contamination

Increased effects, (action)

- Infrastructure where it could cause contamination such as any fuel tanks on site
- Waste disposal methods where they may influence the likelihood of contamination occurring
- Effects on surface and groundwater from contamination

Don't consider

- Minor wetland stabilised due to acid rock drainage (ARD) (this is considered when scoring the water board)



Daily Contaminant Bund Operations

Bund operational procedures clearly signposted

Tablet Scoring Guide

Assessed / Known Degree of Contamination	Depth of knowledge			
	Guesswork	Staff knowledge	Desktop Survey / Walkover	Intensive survey
Uncontaminated	5A	8	9	10
Minor	5	8	7	8
Moderate	2	3	4	5
Major contamination	5A	8	9	10

The above assumes an uncontaminated baseline condition. If there is land contamination already in the baseline condition then adjust your scoring to account for that.

Linear Scoring Guide

01-10	Scores in excess of ten may be given if the site has had contamination to its baseline condition, is fully studied and the degree of contamination has been reduced due to the efforts of Solid Energy.	6	It is suspected that minor contamination may be present due to staff knowledge, but no surveys have been completed to confirm.
10	Intensive surveying has confirmed that the site is uncontaminated or that any contamination is from sources present in the baseline condition. Any contamination caused by the current operations has been investigated to baseline levels.	4	Moderate contamination may be present. Livelihood and recreation have been assessed in a desktop study / walkover. Contamination may have no visible effects.
		2	It is suspected that moderate contamination is present on site, but there are no current staff who can describe materials used and handling procedures during the life of the mine.
8	Minor contamination may have been confirmed by intensive surveying, while extensive contamination may have been investigated, with low level residual contamination still in situ.	10	It is confirmed or suspected that major contamination exists at the site. There are likely to be visual impacts, either on vegetation or areas of soil that are clearly contaminated. Clean-up works have not begun.



2004 - Improvements, Web

The screenshot shows a web browser window titled "Solid Energy Annual Environmental Survey - Microsoft Internet Explorer provided by MWH". The address bar shows the URL "http://redc1gis1.mwhglobal.com/senzpoll/". The page header includes the Solid Energy logo and the text "Environmental Questionnaire". A navigation menu contains links for "Home", "Contact Admin", "Instructions", "Online GIS", and "Get Help". The main heading is "Environmental Survey 2004", followed by a notice that the survey will be closed on 19-7-2004. Two orange buttons, "Start Survey" and "Resume Survey", are prominently displayed. Below these is a light blue box with the heading "Welcome to the Solid Energy 2004 Environmental Questionnaire". The text in this box explains that the survey is easier to understand than in 2003 and lists four steps: Step 1 (entering details), Step 2 (scoring issues), Step 3 (final question), and Step 4 (review and save). It also mentions "Next Step" and "Previous Step" buttons and an "End Survey" button. A "HOT TIPS" section at the bottom advises being careful with email addresses.

Solid Energy Annual Environmental Survey - Microsoft Internet Explorer provided by MWH

File Edit View Favorites Tools Help

Address http://redc1gis1.mwhglobal.com/senzpoll/

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Environmental Questionnaire

[Home](#) [Contact Admin](#) [Instructions](#) [Online GIS](#) [Get Help](#)

Environmental Survey 2004

This survey will be closed on 19-7-2004. Please read the introduction below before starting a Survey.

[Start Survey](#) [Resume Survey](#)

Welcome to the Solid Energy 2004 Environmental Questionnaire

Many of you who completed this survey in 2003 will find aspects similar to last year, but there are major changes (we hope improvements), that should make this years survey easier to understand and work with.

At any time you can refer back to these instructions by selecting [Instructions](#) from the top orange toolbar.

After entering the site for the first time (by pressing [Start Survey](#) above) you will be presented with Step 1. The site is arranged as follows;

- Step 1** - entering your details and choosing your sites
- Step 2** - Scoring the issues and site(s)
- Step 3** - Final general question
- Step 4** - Review and save your responses then and [End Survey](#).

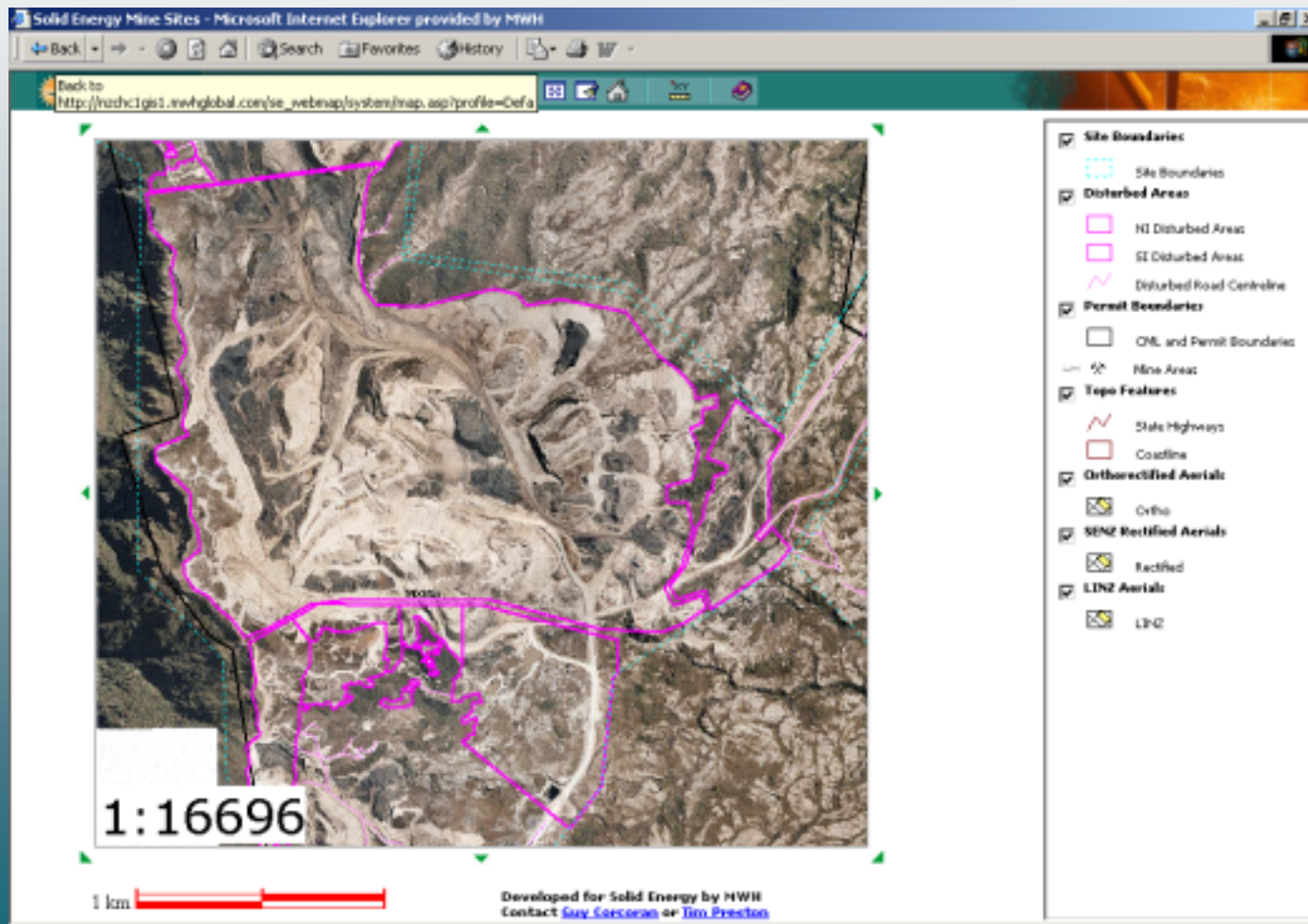
To go from one step to another look for the [Next Step](#) and [Previous Step](#) buttons. You can go back to an earlier step (for example to add another site that you decided to score) at any time. You don't have to do this survey all at once - you can skip to Step 4 [End Survey](#) and then resume from where you left off at a later time.

HOT TIPS

At Step 1 be careful with entering your email address. You will have to reenter this (and your reference

Internet

2004 - Improvements, GIS



2004 - Improvements, Involvement

- **Wider stakeholder group**
 - Fish and Game
 - Dept of Conservation
 - Territorial Authorities
- **3rd Party Reviews**

Achievements, so far.....

- Major awareness raising
- Positive site comparisons
- Learning from others
- **2004.....**

