
SOME ENVIRONMENTAL AND ENFORCEMENT ISSUES RELATING TO THE SITING OF A MEDIUM SCALE STEEL MILL ON THE SHORES OF THE MANUKAU HARBOR, AUCKLAND, NEW ZEALAND

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SUMMARY

A Steel Mill (in various corporate forms on its present scale) has operated a site on the shores of the Manukau Harbor since the mid 1980s. The two major consents (permits) granted in 1985 relating to combined stormwater and treated wastewater discharges from the site were in the period 1986 to 1988 often in varying degrees of noncompliance and consequently the subject of extensive consultation and a prosecution for serious breaches of the Consent (Permit) in 1988. Consent (Permit) approvals included stringent environmental standards, self-compliance monitoring, check monitoring (inspection) by the Regional Council (licensing authority), and environmental monitoring within the mixing zone and wider harbor environs.

Many problems have arisen with respect to the definition of compliance, the extent of the mixing zone¹ and with interpretation of environmental effects. These have resulted in a range of responses from regulatory enforcement (prosecution) to fully consensus based solutions.

This case study looks at the evolution of both statutory and voluntary controls on the site and its operations. Also how environmental values were identified, monitored and protected.

1 INTRODUCTION

1.1 Administrative framework

The Auckland Regional Council ("the Council") is the agency responsible for environmental management and enforcement in the Auckland region. Its responsibilities include the permitting of discharges of contaminants to air, soil and water. It is also responsible for pollution abatement and control.

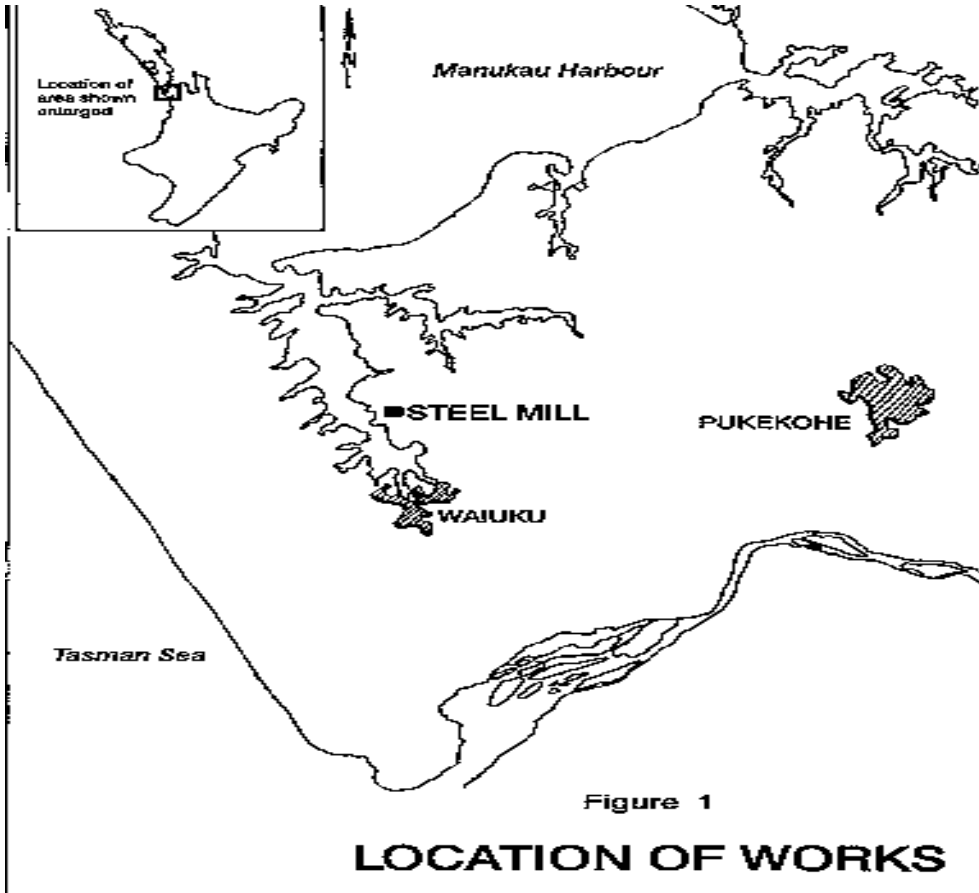
1.2 Background to the paper

The Steel Mill has occupied a site on the shores of the Manukau Harbor since the early 1970s (see Figure 1). In the early 1980s the Company applied for a comprehensive set of land-use and contaminant discharge permits to cover a major expansion at the site. The permits included discharges to air and water and noise emissions. This paper discusses issues relating only to the water discharges.

1.3 The permits granting process

The applications for discharge permits were the subject of vociferous opposition by environmental interest groups and local Maori (the indigenous people). The applications were considered and granted by a statutory hearing committee of the Council. Stringent effluent

standards and self-monitoring were imposed. Subsequently these decisions were appealed to a full judicial body (the Planning Tribunal). The original decisions were upheld and consents (permits) consequently came into effect with a term of fifteen years.



2 PERMITS SET THE SCENE

2.1 Liquid effluent standards

Annex 1 details the effluent parameters, standards and compliance definitions. It is of interest to note that the Company requested a set of interim standards be included. These would have been somewhat less stringent than the final standards to allow for the construction phase. This request was denied.

It should be noted that the effluent quality standards were proposed by the Company and its consultants. These were considered to be particularly stringent and therefore Council saw no need to oppose their adoption.

2.2 Environmental monitoring requirements

Annex 2 reproduces the two key special conditions relating to the environmental monitoring to be undertaken.

It will be noted that the final specifications were to be agreed between the Company and the Council at an unspecified future date.

3 ENFORCEMENT HISTORY

Right from the earliest days of the expansion at the site the Company had difficulties complying with some of the effluent standards. Initially this involved pH, temperature, suspended solids and total zinc. Ultimately the chronic noncompliance revolved around suspended solids and total zinc. The pH problems were resolved and temperature exceedances were waived as the standards were considered inappropriate. It should be noted that during this period the Company was complying with all other liquid effluent standards.

For the first couple of years the Council adopted a highly pragmatic approach to reported noncompliance. During this phase discharge volumes were well below those permitted therefore even with concentration exceedances mass discharges of contaminants were considered acceptable.

In late 1986 the Council became more and more concerned at the on-going noncompliance. From this time onwards the Council began 'flagging' to the Company its increasing dissatisfaction. Several written warnings were issued to the Company.

In an attempt to resolve the situation Council and Company staff met on several occasions. While progress was made a satisfactory level of compliance did not eventuate and the issues came to a head in early 1987.

After a monthly self-monitoring report identified significant noncompliance with respect to zinc the Council resolved to initiate a prosecution of the Company. The Company responded by requesting a meeting with the Council at political level. As a result of the meeting the Company agreed to bring forward a review of its wastewater treatment systems using overseas consultants but the prosecution was not withdrawn. Ultimately however, the case did not proceed as charges were withdrawn after the Company's consultants provided a credible defence at the eleventh hour to be excused from being held responsible. The Company engaged the consultants to review the capability and performance of its stormwater and effluent systems and identify a means for compliance.

An action plan was developed which included significant separation of stormwater and treated effluent systems, recovery of stormwater for process use, surge capacity for storm flows and the installation of a centrifuge to manage the growing slurry handling problem.

However, before the actions were fully completed by the second half of 1988 a series of significant noncompliance records were reported which the Council considered unacceptable. These involved exceedances of the suspended solids standard by 195 times and the zinc standard by 21 times. The Company's explanation was not considered acceptable and the Council resolved to initiate a prosecution. Thirteen charges were laid.

The case proceeded to court and the Company was subsequently convicted on twelve of the thirteen charges. Fines and costs amounting to NZ\$41,000 (US \$67,556) were imposed.

NOTE: The maximum penalty provided for at the time was NZ\$150,000 (US \$247,158) and NZ\$10,000 (US \$16,477) per day for an on-going offense.

4 ENVIRONMENTAL MONITORING ISSUES

The initial environmental monitoring program involved multiple sites, sediment sampling and three species of shellfish. This design was reduced to one species of shellfish after three years of sampling as the additional monitoring was contributing little to the detection of impacts.

The Company undertook monitoring within the mixing zone and at a control site. The Council undertook monitoring outside of the mixing zone and at a control site. Overlapping sampling at one control and one test site was undertaken. Sampling and analyses were undertaken by independent field staff and laboratories.

For the first two or three years no problems came to light. However, after this time significant increases in total zinc were recorded in shellfish and the two data bases came under close scrutiny. Both data bases were confounded by major discrepancies at the overlapping sites.

Neither laboratory would accept responsibility and what transpired was a drawn out debate over methodology. This was only resolved when an independent reviewer audited the various designs and procedures. The outcome was that one laboratory was to be used and this was to implement a jointly agreed to quality assurance/quality control (Quality Assurance/Quality Control) program.

A considerable amount of time and money was wasted because the issues were not identified and addressed at the beginning of the monitoring program.

5 COMPLIANCE AND ENFORCEMENT PROBLEMS

5.1 From the Company's perspective

For various reasons there were problems for the Company inherent in the original permits. The major ones were:

- Without a transitional set of more relaxed standards there was virtually no way the Company could achieve compliance during the construction and commissioning phases.
- The nine at source effluent treatment systems were shown to be highly vulnerable to being compromised. They were without "downstream" back-up and when one system went down the whole effluent stream was at risk of noncompliance.
- The importance of contaminated stormwater from the 92ha industrial site was not recognized. The stormwater and effluent streams were combined well "up-stream".
- The Company's management staff perhaps for too long believed that compliance would be possible by better process control rather than major engineering modifications.
- The detailed effluent standards promoted by the Company were always going to be difficult to achieve.
- The higher than anticipated amounts of zinc in the iron ore, subsequently released from the thermal processes and captured by wet scrubbers, resulted in higher than anticipated loadings on the liquid effluent treatment systems.
- Delays in the reporting of effluent analyses exposed the Company to on-going noncompliance and late response to problems.

- Standards imposed meant that zinc and chrome based water treatment corrosion control regimes could not be used. The Company has struggled for years to gain acceptable corrosion rates in cooling systems.

5.2 From the Council's perspective

While the development of the effluent permit standards and general conditions were the subject of comprehensive technical input a number of fundamental problems were present which were not recognized. The major ones were:

- That the complex effluent and environmental monitoring required a very high level of Quality Assurance/Quality Control between the participating laboratories. This was ultimately resolved by detailed inter-laboratory checking and in the case of the environmental sampling a single laboratory was finally used. However, the lack of forethought resulted in much wasted effort and rendered blocks of data unusable.
- The definition of an "unacceptable effect" was not resolved until mid 1987.
- The definition of the mixing zone was not finalized until 1987.
- While effluent mass discharge was specified the mixing with contaminated stormwater completely undermined the use of mass discharge to measure permit compliance.
- The fact the Council in general had to rely upon self-monitoring data for enforcement created potential legal problems with respect to the use of such data for a prosecution.

6 LESSONS FOR BOTH THE REGULATOR AND REGULATED

Reliance on what were considered to be stringent effluent standards based on USEPA criteria gave all parties a false sense of security.

The Company incorrectly assumed it could achieve the standards "at source". The standard adopted for total zinc at one of the outfalls was in fact below "normal" stormwater levels.

The deferring of the definition of the 'mixing zone' was wrong as it was fundamental to the defining of compliance.

The deferring of defining an 'unacceptable effect' was also wrong. Too much emphasis was placed upon effluent standards as against the purpose of imposing such standards.

During the permit hearings the focus of evidence adduced was on the effects upon natural ecosystems. In fact, the final criteria for acceptability related to ensuring shellfish were not rendered unsuitable for human consumption outside of the 'mixing zone'.

The interaction between various processes was not acknowledged. The interaction between the air emissions controls and the liquid effluent stream was not allowed for. Also, for the purposes of liquid effluent concentrations stormwater was assumed to be uncontaminated, this was incorrect.

The Company failed to give the compliance with consents (permits) the importance it deserved considering the penalties involved.

This was reflected in the learned Judge's written decision in convicting the Company. In brief the Judge concluded:

"My essential finding was that — (The Steel Mill) — pushed its production program well ahead of its ability to comply with the water right. When it encountered difficulties in complying with that right it did not adequately adjust its operations."

Analytical time frames need to reflect those defined in the permit compliance specifications.

Under New Zealand law there is an unresolved question mark over the admissibility of self-monitoring data as evidence for a prosecution.

7 CONCLUSIONS

Effluent standards should be relevant to the environmental protection issues involved and not simply adopted 'holus bolus' from published criteria.

Environmental monitoring programs intended to protect against unacceptable impacts should be considered in their entirety at the permitting stage.

Sampling and analytical procedures need to be the subjects of detailed protocols and Quality Assurance/Quality Control specifications prior to implementation.

Companies holding comprehensive waste discharge permits need to ensure those responsible for compliance are given the administrative technical and operational support necessary to achieve permit compliance.

Regulators dealing with large and complex procedures need to ensure that all interacting components are identified at an early stage and dealt with comprehensively.

The objectives of effluent standards and the particular resource values to be protected need to be identified at an early stage.

Enforcement via legal remedies is exceptionally time consuming and expensive for all parties.

ENDNOTES

1. Editors note: The definition of a mixing zone is the geographic area of a waterbody over which a pollutant concentration is mixed with the water and diluted.

Parameter	Maximum or Range not to be Exceeded	Monitoring to Detect Maxima	Maximum Monthly Averages	Monitoring and/or Calculations to Establish Averages
CONVENTIONAL				
pH	6 - 9.5	a	N/A	-
Temperature (°C)	25	a	N/A	-
Suspended solids	30	a	15	Monthly average of results from (a)
Dissolved Oxygen	4 (minimum)	a	N/A	-
Chemical Oxygen Demand	40) based on	g	.	-
Oil and Grease	10) daily composite	g	2	Monthly average of results from (g)
TOXIC SUBSTANCES				
Zinc	1.5	a, d	0.2	e
Chromium 3+	0.2	b	0.005	e
6+ ⁽¹⁾	0.1	b	0.005	e
Nickel	0.5	b	0.03	e
Lead	0.2	b	0.06	e
Copper	0.2	a	0.03	e
Mercury	0.0025	b	0.00125	e
Silver	0.02	c	-	e
Antimony	-	c	-	e
Cadmium	0.6	c	0.0025	e
Arsenic	5	c	0.6	e
Cyanide (2)	0.3	c	0.05	e
NON-CONVENTIONAL POLLUTANTS				
Iron	12.5	b	3	e
Aluminium	-	-	-	e
Phosphorus	-	-	-	e
Fluoride	-	-	20 weekly result only	f

NOTES AND MONITORING FREQUENCY CODES

- Chromium may be measured as total chromium until the concentration exceeds 0.1 mg/1 on grab samples and 0.005 mg/1 on composited samples.
- No monitoring of cyanide is required until this material is used in the works.