



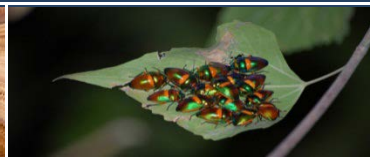
EcOz

Environmental
Services

Appendix K2 Economic & Social Impact Assessment



Sherwin Iron (NT) Pty Ltd
Sherwin Creek Iron Ore Project
Environmental Impact Statement



2013





Economic and Social Impact Assessment Sherwin Creek Iron Ore Project Sherwin Iron Limited

Sherwin Iron Limited
4/4 Shepherd Street
Darwin, NT, 0800

Table of Contents

1.0	Introduction	4
2.0	Methodology.....	5
3.0	Risk Assessment	6
3.1	Territory wide risk assessment.....	7
3.1	Regional risk assessment	9
4.0	Brief History of the Roper River Region	9
5.0	Regional Communities and Demographics.....	10
5.1	Population and population dynamics	10
5.2	Employment and Income.....	11
5.3	Community Access and Infrastructure	12
6.0	Regional Services and Facilities	13
6.1	Utilities	13
6.2	Policing.....	14
6.3	Health Services	15
6.4	Education	15
7.0	Regional Industry and Land Use	16
7.1	Non-government facilities and equipment	16
7.2	Pastoralism (Cattle Industry)	17
7.3	Conservation and Tourism	18
7.4	Light Industry	18
7.5	Mining, Oil and Gas and Exploration.....	18
8.0	Potential Impacts	19
8.1	Positive Impacts and their management	19
8.2	Risks and their management.....	21
8.3	Management beyond the life of mine	23
10.0	References.....	25
	Attachment A: Outcomes of Regional Risk Assessment.....	26

Approvals and Quality Control

Company Details:

Sherwin Iron Limited
4/4 Shepherd Street
Darwin, Northern Territory,
Australia

Document Author	
Manager Responsible	
Authorising Director	

File Name:	130913 Economic and Social Impact Assessment v 3.0.docx		
Version	1.0	Date of Review	30 September 2013
Date of Issue	30 September 2013	Review Due	30 September 2014

ECONOMIC AND SOCIAL IMPACT ASSESSMENT FOR THE SHERWIN CREEK IRON ORE PROJECT

1.0 Introduction

Sherwin Iron Limited proposes to develop an iron ore mine within the Roper River region, located approximately 160km east of Mataranka in the Northern Territory. This is known as the Sherwin Creek Iron Ore Project (the Project). It involves open pits; external and internal haul roads; ancillary mining infrastructure; and an accommodation village. Over the first 7-12 years of its life, Sherwin Iron expects the mine to produce 39.2 Mt of oolitic haematite for supply to market as a direct shipping ore (DSO). Additional DSO mineral resources and others that require beneficiation are known and may be pursued following completion of the Project. Including these resources, the project is estimated to be worth several billion dollars.

Development of the Project therefore represents a significant economic opportunity for the Roper River region and its inhabitants, the majority of whom are Aboriginal people living in impoverished conditions. However mining is an ambivalent process that while providing opportunities for increased wealth can also threaten destruction of land, culture and social fabric – particularly those of a traditional nature. History has shown that many mining-related impacts have had an irreversible and intangible effect on core socio-cultural values making it vital to identify, predict and mitigate them in advance. An important goal of Sherwin Iron is to create a suitable balance between socio-cultural protection and economic development, such that impacts are minimised in the face of maximized benefits.

As part of the approvals process, Sherwin Iron is required to complete a risk-based economic and social impact assessment (i.e. an ESIA) of the potential positive and negative social and economic impacts that its operations will have on nearby communities. Further ESIA documentation will be required should Sherwin Iron seek to recover resources additional to the DSO extracted from Sherwin Creek. Detailed guidelines for the focus of the ESIA provided by NTEPA are found in Appendix A of the EIS. In respect of defining the contents and structure of the ESIA, the most important of these guidelines are:

- i) Estimates of the quantity and value of production/exports relating to the mine, including expected reduction in revenue should the proposal not proceed;
- ii) An estimate of the value to the local economy associated with expenditure during the construction phase and the annual expenditure on regional goods and services as it relates to the mine and associated infrastructure;
- iii) Benefits to the local community, during and beyond the life of the mine, such as development of new skills and facilities, economic development and opportunities for local and regional business and employment opportunities;
- iv) The risks of the mine, related infrastructure and associated workforce negatively impacting on identified social issues in the region.

This document provides an assessment of the economic and social impacts expected from development of the Project. The outcomes follow from a risk-based assessment compiled through acquisition of statistical data available for the region and anecdotal information obtained through stakeholder engagement and consultation. The assessment provides a baseline analysis of the regional socio-economic profile, a summary of available services and an interpretation of how the Project might impact upon these. In addition, the Stakeholder Consultation and Engagement Report has been attached as it provides greater detail on various aspects of the assessment process.

In addition, a Social Impact Management Plan (SIMP) has been prepared to demonstrate that Sherwin iron has plans to address any identified risks associated with the ESIA. The SIMP is derived from the outcomes of this assessment and is attached as Appendix K2 of the EIS.

2.0 Methodology

This assessment was undertaken through a combination of desktop research and analysis; and direct consultation with key stakeholders and other affected parties. A list of principal stakeholders contacted is provided in the attached Stakeholder Consultation and Engagement Report.

Desktop research involved a comprehensive assessment of publicly available documents and data relevant to the four principal communities affected by the project. Information was drawn from previous stakeholder consultations undertaken for the Western Desert Resources (in 2012) and Australian Ilmenite Resources (in 2012) projects, both of which are operating in the same vicinity and impact on the same groups of people. This, along with background statistical information gleaned from the 2011 and 2006 Australian Censuses provided the background for targeted and well-focused consultations.

Consultation with traditional Aboriginal owners has been ongoing since 2007, in the form of large group discussions during Agreement negotiations, discussion with individuals during tours of the Project as it has developed and discussion with Aboriginal representatives of community organisations and corporations. Face to face consultation with other stakeholders, including pastoralists, service providers, government and non-government organisations were more sporadic, although a concentrated effort was made to consult during July and August 2013.

Formal risk analysis was undertaken in accordance with international standard IEC/ISO 31010. IEC/ISO 31010 provides guidance on selection and application of systematic techniques for the assessment of risk. Risks that are likely to have a detrimental (or negative) socio-economic impact have been assessed here using the consequence/probability matrix method. The information obtained has then been summarized and used to develop the regional social profile and summaries of available services presented in sections 6 and 7, respectively. From these, suitable criteria against which potential impacts might be measured were developed.

3.0 Risk Assessment

All socio-economic risk-based assessments were undertaken in accordance with international standard IEC/ISO 31010. IEC/ISO 31010 provides guidance on selection and application of systematic techniques for the assessment of risk. Risks that are likely to have a detrimental (or negative) socio-economic impact have been assessed using the consequence/probability matrix method.

Under this method, risk is defined as the probability of something occurring that will have an impact on objectives. The risk assessment process involved identifying potential hazards; analyzing the likelihood that each hazard will occur and determining the consequences of their outcomes. Management programmes were then considered for each hazard and a new likelihood, consequence and ranking (or residual risk) was determined.

Ranking of consequences and the probability of their occurrence are shown in Tables 3.1 and 3.2. Where a positive (or beneficial) impact is anticipated, the consequence can be considered to have a nil value. A matrix can then be developed by 'multiplying' each probability with the determined consequences to provide guidance on the level of risk of each aspect and a ranking of its priority. This is shown in Table 3.3.

The risk assessment applied here used a two-step approach. The first step involved consideration of the whole of the project in terms of Territory-wide impacts. This allowed identification of an area where the highest level of impact is to be expected and led to step two; which was a more detailed study and assessment of potential socio-economic impacts within that area. This was important because it permitted a Social Impact Management Plan to be developed that was highly focused and relevant to the most affected communities.

Consequence		
1	Insignificant	Impact occurs, but is negligible Nil to very low financial loss
2	Minor	Impact is minor, temporary and reversible No publicity likely Low financial loss
3	Moderate	Impact is substantial, but temporary and/or reversible Expressions of stakeholder enquiries and concerns Moderate financial loss
4	Major	Impact is substantial, long-term, but may still be reversible Significant stakeholder interest and loss of company credibility Significant financial loss
5	Catastrophic	Impact is irreversible Major stakeholder concerns and/or media interest Extreme financial loss

Table 3-1: Significance based ranking of consequences for adverse impacts

Likelihood			Probability Criteria
1	Rare	Will occur only under exceptional circumstances	< 1%
2	Unlikely	Improbable, but could occur at some time	1 – 10%
3	Moderate	Might occur as it has been observed previously under similar conditions	11 – 50%
4	Likely	Will probably occur under most circumstances	51 – 90%
5	Almost Certain	A common or repeating occurrence	> 90%

Table 3-2: Qualitative measure of the likelihood of the impact occurring

Likelihood	Consequence					
		1	2	3	4	5
	1	(1)	(2)	(3)	(4)	(5)
	2	(2)	(4)	(6)	(8)	(10)
	3	(3)	(6)	(9)	(12)	(15)
	4	(4)	(8)	(12)	(16)	(20)
	5	(5)	(10)	(15)	(20)	(25)

	Low risk (one that is acceptable or can be tolerated in the long-term)
	Medium risk (one that can be tolerated in the medium-term)
	High risk (one that can be tolerated in the short-term)
	Severe or extreme risk (one that is unacceptable and cannot be tolerated)

Table 3-3: Matrix for determining ranking and acceptability of risk by combining likelihood of occurrence and consequences of the Project.

3.1 Territory wide risk assessment

While environmental impacts are generally confined to a well-defined area, socio-economic and cultural impacts are not as well confined in time or space. The Project is long-term, involves mining of iron ore and its transportation by road to the Port of Darwin and therefore has the potential to attract interest in employment opportunities from around the Territory and interstate. Consequently, a range of different inter-related impacts will be felt across a wide area, but their significance is expected to diminish with distance from the Project and size of each community affected. These impacts will range from provision of goods and services, employment and training opportunities, traffic movements and general movement of population into local communities; and have the propensity to bring with them not only benefits, but also undesirable social consequences.

In terms of maximizing positive benefits and mitigating negative impacts of the Project, it was important to determine where the greatest extent of social impact is likely to occur. This was done by considering the principal foreseeable impacts on each community along the route or in close social proximity to the Project. Table 3-1 provides a summary of the types of impacts and their significance to the communities most likely to be affected by the Project

Assessing social proximity requires consideration of how families are spread throughout the region, communicate and interact with each other. This is an important factor when assessing impacts on Aboriginal culture because family groups are often widespread and may live in a number of distant communities that may not be directly impacted. Consequently, communities such as Borroloola and Numbulwar were included in the initial assessment for the Project even though they are not physically close.

Community	Population	Distance from Project (km)	Principal foreseeable Impacts	Significance of Impact
Borroloola	926	395	Efflux of people seeking employment	Negligible – Low
Numbulwar	687	217	Efflux of people seeking employment; increase in disposable income; alcohol and drugs	Low – Moderate
Ngukurr	1056	61	Influx of people seeking employment; development of light industry; provision of goods and services; pressure on infrastructure; increase in disposable income; alcohol and drugs	High
Urapunga	88	36	Influx of people seeking employment; provision of goods and services; pressure on infrastructure; increase in disposable income; alcohol and drugs	Moderate – High
Minyerri	484	80	Influx of people seeking employment; development of light industry; provision of goods and services; traffic movements; pressure on infrastructure; increase in disposable income; alcohol and drugs	High
Julkminggan	280	107	Influx of people seeking employment; traffic movements; pressure on infrastructure; increase in disposable income; alcohol and drugs	Moderate
Mataranka	244	160	Efflux of people seeking employment; increase in disposable income; traffic movements; alcohol and drugs	Low – Moderate
Katherine	6,094	270	Efflux of people seeking employment; increase in disposable income; traffic movements; alcohol and drugs	Low
Pine Creek	380	360	Traffic movements	Low
Adelaide River	240	470	Traffic movements	Low
Darwin	103,000	580	Traffic movements	Negligible

Table 3-1: Summary of foreseeable impacts on major communities likely to be affected by Project operations.

3.1 Regional risk assessment

Ngukurr, Minyerri, Urapunga and Jilkminggan were the major communities considered to be at greatest risk from the Project. Minor communities (outstations) within this 110km radius are Mole Hill, Kewyuli and Badawarrka and they have also been considered to be at the same level of moderate – high risk from the Project. All of the major and minor communities included in the focused risk analysis have close family connections and cultural affiliations with the Project area.

The outcomes of the regional risk assessment are presented in Attachment A and discussed in greater detail in Section 8.2 and the SIMP.

4.0 Brief History of the Roper River Region

A brief history of this region is provided to place the regional socio-economic profile (which follows in section 4.0 into context. This may assist with interpretation of the outcomes reported in the regional profile, explain why solutions to some social problems have been difficult to find and why Sherwin iron may encounter problems or resistance to its social objectives in the future.

Indigenous occupation of the Roper River area prior to the arrival of Europeans has not been thoroughly studied, but is believed to be generally consistent with that across the broader Top End. This area is rich in resources that are seasonally exploited, thus allowing large groups of people to gather for ceremony and other purposes. Recent archaeological finds suggest a well-established and settled hunter-gatherer society existed and continues to exist to this day.

It is believed that first contact with another culture dates back to around 1650, when Macassan traders began seasonal journeys to the north and western coasts of the continent, fishing for trepang, as far south as the bottom of the Gulf of Carpentaria (Powell 2000:39). However, the full extent of this contact remains unknown. The first European to penetrate the region is thought to have been Ludwig Leichardt, who crossed the Roper River while travelling from Brisbane in search of Australia's Northern coastline in 1845.

With the expansion of the cattle industry across the northern reaches of Australia, a stock route was pushed through along the Roper River in 1872. By the 1880's a number of large leases were taken up over tribal lands, bringing Aboriginal hunter-gatherers into direct conflict with pastoralists, usually over access to vital resources such as water. This led to a number of massacres, with Aboriginal people gradually forced to re-settle in areas of land (now known as south-east Arnhem land) north of the Roper River.

By 1908, the Church Missionary Society established a new mission on the Roper River, at the current location of Ngukurr. Aboriginal people used the mission as a refuge from the mistreatment they had received from the pastoral industry, however this resulted in massive changes to Aboriginal culture across the region, first through a gradual westernisation of the people and then as a result of a shift from animism to Christianity. The Roper River mission continued to operate until 1968, when government policies of self-determination led to the eventual closure of all missions across the Northern Territory.

Pastoralism has continued to be the dominant industry in the Roper River region since the early 1900's, and has offered sporadic employment. This has allowed Aboriginal people to maintain contact with their land and their ceremonies; and ultimately regain some level of control of their culture following passage of the Aboriginal Land Rights (Northern Territory) Act 1976 and the Native Title Act 1993. These factors, along with a diaspora known as the 'homelands movement' in the 1970's have led to the gradual development of major Aboriginal communities such as Minyerri, Jilkminggan, Ngukurr and Numbulwar and establishment of a number of smaller communities or outstations.

Although the iron ore deposits near Minyerri and Urapunga were discovered in the late 1950's, their remoteness and the general lack of accessible light industrial resources meant that they were not considered economically viable. It is only in recent times, with an increase in international demand for steel that focus has again shifted towards exploration and production of minerals within the Roper River region.

There has been little in the way of industrial development of the region for more than 100 years and pastoralism is currently suffering a slow decline. Many of the Aboriginal communities remain underdeveloped and as a consequence, unemployment and social problems have been prevalent for a long time. It appears that the region has been dysfunctional for so long that a significant amount of inertia and apathy has developed.

5.0 Regional Communities and Demographics

The regional socio-economic profile describes the demographics of the communities determined to be at greatest risk from the Project. It covers communities within a radius of 110km from the Project and its surrounds including:

- major communities at Jilkminggan, Ngukurr and Minyerri;
- the minor community at Urapunga;
- outstations at Mole Hill, Kelwuyi and Badawarrka; and
- Moroak, Hodgson Downs, Namul-Namul, Flying Fox, Lonesome Dove, Big River and Mount McMinn cattle stations.

Although the larger communities of Mataranka and Katherine will be affected by the passage of ore trucks through to Darwin, they have not been included in this analysis as, other than additional traffics, the impacts to them from the Project was deemed to be relatively small.

5.1 Population and population dynamics

A summary of key population statistics is provided in Table 5-1.

In 2011, the total population of the four main communities was 1908, of which 48% are male and 52% are female. The ratio of indigenous to non-indigenous residents is high, with 92.8% of the region's population of Aboriginal or Torres Strait Islander descent (Australian Bureau of Statistics, 2011). The median age is around 20 years and approximately 35% of the regional population is children under the age of 14. These measures have shown little change since 2006 (Australian Bureau of Statistics, 2006).

Population levels at Minyeri, and Jilkminggan have remained effectively stable (increasing by 1.7% and 2.9% respectively) over the past 5 years; while that of Ngukurr has increased by more than 15%. 2006 census data for Urapunga was unavailable so a measure of population growth for that community could not be determined. With the exception of Ngukurr, these dynamics reflect the general slow growth consistent with small, remote communities where there is little in the way of regional development.

In 2009, the Federal and Northern Territory Governments targeted Ngukurr as one of 20 regional 'service hubs' or 'growth towns'. This has encouraged investment, which has led to a flow-on in population growth and small-scale construction activities. Other, more recent developments that have led to changing population dynamics in the wider region include the proposed iron ore mine near Towns River (Ecoz, 2012a).

The outlook is for further growth, with Ngukurr projected to grow by an average of 1.6% over the next 15 years (NT Government, 2011). It is unlikely that the same level of growth will be seen at other regional communities, with the possible exception of Boroloola. However, if the rate of growth currently experienced remains, total regional population is expected to be between 2500 and 3000 by the year 2025.

	Jilkminggan	Minyeri	Ngukurr	Urapunga	Badawarrka	Kelwuyi
Population	280	484	1056	88	~15	~25
Male	138	234	503	44		
Female	142	250	553	44		
Aboriginal/TSI	96%	91%	92%	95%	100%	100%
Median Age	17	19	22	16		
Rate of Growth	2.9%	1.7%	15%	n/a		

Table 5-1: Population demographics for region affected by the Project.

5.2 Employment and Income

A summary of key income and employment statistics is provided in Table 5-2.

At 24%, regional unemployment is significantly higher than the Territory's average of 4%. Underemployment is also a problem with 34% of the regional workforce involved only in part-time work of less than 15 hours per week. There is a diverse range of employment opportunities available within the region, however the number of positions is small. The majority of people engaged in employment work in local government administration (20 – 40%), education (8 – 20%) or local retail (6 – 8%). Exact distributions vary across communities, with the larger community of Ngukurr offering the greater range of work.

In general, communities within the Roper River region can be classified as impoverished. At <\$300 per week, average personal income levels within the region are less than 50% of those received across the Northern Territory (\$745 per week). This reflects high levels of regional unemployment and underemployment and a generally high reliance on social benefits along with limited opportunities for high paid professional work.

	Minyerri	Jilkminggan	Ngukurr
Median Personal Weekly Income	\$283	\$258	\$279
Employment Type			
Full time employees	53	7	122
Part-time employees	68	45	74
Unemployed	18	0	114
Total Labour Force	157	55	331
Industry of Employment			
Local Government Administration	58	30	82
Education	18	10	19
Health	3	3	8
Pastoral Industry	14		
Retail and Sales	5	4	14
Occupation Type			
Clerical and Administration	6	3	20
Community and Personal Services	34	17	54
Drivers and Operators	5		10
General Labourers	54	15	35
Technicians and Tradesmen	5	3	10

Table 5-2: Income and employment demographics for region affected by the Project. Data not available for Urupunga, Kewyuli and Badawarrka

Regional communities are highly governed, with the majority of employment in government sectors and administration. Private enterprises, where they exist, tend to be opportunistic and do not offer high levels of employment. As a consequence, the region's technical skill base is poor with a focus on general labour and operation of equipment necessary to maintain community infrastructure.

5.3 Community Access and Infrastructure

Jilkminggan, Minyerri, Urupunga and Ngukurr are accessible via the Roper Highway, a single lane road that is sealed to about 50km west of the Roper Bar. Roads accessing the communities are all unsealed from their respective junctions with the Highway. Ngukurr is isolated during the wet by the Roper River and access to Minyerri is often limited due to localized flooding. However, both Ngukurr and Minyerri have all year access via lighted and sealed airstrips.

The community of Ngukurr has good infrastructure, with sealed roads and a number of freshly constructed houses and service buildings. Proposals exist to construct more housing at Ngukurr, Minyerri and Jilkminggan and further hotel accommodation in Ngukurr. However, road infrastructure in Minyerri and Jilkminggan are, in comparison, poor.

Availability of housing across the region is tight and this has led to overcrowding in the major communities. In 2011, each of the communities had an average household occupancy of about 8 people, which is more than twice that for the wider Northern Territory (Australian Bureau of Statistics, 2011). A gradual increase in levels of dwelling occupancy has been observed over the past 5 years, due mainly to localized population increases along with a gradual decline in the number of livable houses. The decline in availability of housing over the long-term appears to be linked closely to inadequate investment in regional construction and maintenance programs and represents another indicator of the generally poor regional economic situation.

A summary of key infrastructure related information and statistics is provided in Table 5-3 and further detail can be found in section 6.0.

	Jilkminggan	Minyerri	Ngukurr	NT
Population	280	484	1056	211945
Occupied Dwellings	34	59	121	60889
Unoccupied Dwellings	7	14	19	8595
People per house	8.2	8.2	8.7	3.4

Table 5-3 Summary of government provided facilities and services available at regional communities.

6.0 Regional Services and Facilities

6.1 Utilities

Prior to 2008, Aboriginal Corporations such as Alawa and Yugal Mangi, were local councils and responsible for maintaining government services (i.e. health, education, policing and welfare) and utilities (i.e. communications, power, water and sewage) at Minyerri and Ngukurr respectively. These services became the responsibility of the Roper Gulf Shire following amalgamation of local service delivery by the Northern Territory in 2008. A summary of Government-based facilities and services available at regional communities close to the Project is provided in Table 6-1.

Community	Distance (km)	Facilities and Services	Details
Badawakarr	21	Nil	Small outstation
Urapunga	36	Airstrip Health Clinic	Gravel strip Serviced from Ngukurr
Kewyuli	44	Nil	Small outstation
Ngukurr	61	Airstrip Education and Training Health Clinic Police Sport	Sealed strip, day/night rating Schools and Adult Training Centre (with proposal to expand) 1 Emergency bed, 5 Registered Nurses, Doctors available Monday to Thursday Fully manned station Football ground, basketball court, Swimming Pool
Minyerri	80	Airstrip Education and Training Health Clinic Police Sport	Sealed strip, day/night rating Schools 1 Emergency bed, 3 Registered Nurses Station manned from Katherine Football ground, water slide
Mole Hill	80+	Nil	Small outstation
Jilkminggan	80+	Airstrip Education and Training Health Clinic Police	

Table 6-1: Summary of government provided facilities and services available at regional communities.

Since resumption of services and utilities by the Government, Alawa and Yugal Mangi Corporations have taken on a role more suited to economic development and are looking to become less reliant on government funding for their community projects. Projects currently underway include proposals for developing crop farming and pongania (biofuels) plantations at Ngukurr.

Mobile telephone communications along the Roper Highway are patchy and mainly limited to Ngukurr. Minyerri, Jilkminggan and Urapunga rely on landline telephones, while many cattle stations communicate via landlines or UHF radio. Communications along the Roper highway to Ngukurr were upgraded in 2011 with laying of optical fibre cable as part of the National Broadband Network.

6.2 Policing

Vehicle offences, domestic violence and disorderly conduct represent the majority of crimes in the Roper River region. The amount of crime increases with community size. Anecdotal information suggests that smaller communities such as Urapunga and Minyerri are generally considered safe but while Ngukurr is not. Consultations with police indicate that over 90% of community crime is usually related to substance (more specifically alcohol and drug) abuse. However, detailed statistical information on crime and policing was unavailable.

6.3 Health Services

There are no hospitals located in the Roper-Gulf Shire, the nearest being located at Katherine. Sunrise Health Services provides medical and health services across the region, through local clinics. However, there is a proposal to build a larger clinic in Ngukurr. Staffing levels are small and Minyerri clinic operates with 3 registered nurses and two trainees; while Ngukurr has 5 registered nurses. Community health clinics generally carry high workloads, for example the nurses at Ngukurr usually deal with 80 to 120 patients daily. St John Ambulance and Care Flight provide additional remote medical services and patient transport. Airlift is available from Ngukurr and Minyerri 24 hours per day.

Health statistics at regional level for the Northern Territory are difficult to find and presented by hospital zones, rather than according to shires. Statistical data presented below is obtained from composite datasets for the Katherine Health zone, which includes the townships of Katherine and Mataranka as well as Project area and its 110km radial zone. This creates a risk that the statistics are skewed towards urbanized areas rather than remote towns and outcome, however consultation with health staff at Ngukurr and Minyerri suggest that the statistics are fairly consistent around the wider region.

Available statistics show a slight increase (from 1.5% to 2.0%) in hospital admissions for infectious diseases over the period 1993 – 2008. Incidences of tuberculosis have generally decreased, while cancers have increased from 0.5% to 1%. The largest increase has been attributed to endocrine (diabetes), heart disease and nutrition related problems (which have increased from <0.5% to almost 3% across this period. Mental disorders have almost doubled and close to 50% of these have been directly attributed to alcohol. Similar trends are observed for respiratory diseases (such as COPD). Conversely, the rates of renal failure have dropped significantly from 0.6% to 0.1%. Injuries due to transport remained relatively low (0.4%), while assaults have shown a marginal increase (Li et al, 2011).

6.4 Education

Key information related to levels of education is provided in Table 6-2.

Census data suggests that there is a high level of attendance at school, however as data for the 2006 census was unavailable, it is not possible to determine if there has been a trend towards increased attendance following the 2008 Federal intervention. Outcomes of consultation suggest that school attendance has increased, however it is too early to tell if there has been a net positive effect. Many community residents leave school early and do not move into technical or University education.

The quality of education in remote communities must be questioned because many of the school graduates still cannot read and write or process mathematics effectively. Illiteracy and innumeracy are persistent problems in Aboriginal sectors and these inevitably create a general low level skills being available. Many prospective Aboriginal students now travel interstate to receive education, while other community members access local training centres that are specific to an industry, such as the Indigenous Land Corporation's (ILC) training and education centre at Hodgson Downs.

	Jilkminggan	Minyerri	Ngukurr
Preschool	0	13	35
Primary	68	97	158
Secondary	15	34	94
Technical (TAFE)	0	45	3
Tertiary	0	0	6

Table 6-2 Summary of attendance levels at community schools within 110km of the Project area

7.0 Regional Industry and Land Use

The Roper River region is subject to several types of land tenure, many of which cater for specific industry and land use opportunities. These are pastoral leases, mining leases and general township leases. Underlying these are two types of tenure created to address issues of land ownership by Aboriginal people. These are tenure issued under the Native Title Act 1993, where Aboriginal people have the right to continue their traditional customs or Aboriginal communal freehold land, issued under the *Aboriginal Land Rights (Northern Territory Act) 1976 (ALRA)*.

Under ALRA, Aboriginal communities have the right to veto development of any or all proposed projects that might have an impact on their land. If implemented frequently, this may stymie industrial development in the region. Under the Native Title Act, the right to refuse development does not exist, however companies are obliged to negotiate an Agreement. Sherwin Iron's Project is located wholly on Mt McMinn station and is therefore subject to the requirements of Pastoral Leases as well as the Native Title Act.

7.1 Non-government facilities and equipment

Cattle stations are generally required to provide their own utilities and as a consequence of this, many develop their own facilities and procure a range of machinery that is suitable for constructing and maintaining infrastructure. In addition, a number of small private enterprises that are capable of supplying equipment and services operate in Ngukurr, Minyerri and Jilkminggan. A summary of the non-government supplied facilities and equipment that is located within the Project assessment area is provided in table 7-1.

Location	Distance (km)	Facilities	Equipment and services
Big River Station	13	Civil Works	Loader. Grader
Mt McMinn Station	14	Civil Works	Bulldozer, Grader, Polaris, Helicopter
Lonesome Dove Station	18	Currently under care and maintenance	
Flying Fox Station	32	Proposed training and education centre Camp Accommodation	Bulldozers, various trucks, concrete batching plants, Helicopters, access to contracts for other equipment
Namul Namul Station	49		
Ngukurr (Yugal Mangi Corporation)	61	Construction Services and Civil Works Fuel Hotel Accommodation Mechanical Services Stores	2 concrete batching plants. Yugal Mangi has construction alliances with Titan and Remote Housing Diesel and Unleaded Petrol (OPAL) 13 rooms and 3 offices available Workshop 1 ALPA owned
Hodgson Downs Station	78	Training and education centre	
Minyerri (Alawa Corporation)	80	Construction Services and Civil Works Fuel Mechanical Services Stores	Grader, Backhoe, road-rollers, tip-trucks, concrete batching plant, water trucks Diesel, with proposals to provide Unleaded Petrol Workshop 1 ALPA owned, 1 Privately owned
Moroak	101	Civil Works	980 Loader, Grader

Table 7-1: Summary of privately owned facilities, equipment and services available from regional Aboriginal corporations and stations.

7.2 Pastoralism (Cattle Industry)

A summary of key information relevant to some of the impacted cattle stations is provided in Table 6-2.

Pastoralism in the Roper River region began in the 1880's and has passed through a number of cycles of growth and decline. The original, large Roper Valley station was broken down into a number of smaller stations in an attempt to retain economic viability. Most station owners (with the exception of Hodgson Downs) believe that their stations are underdeveloped and have the capacity to hold more cattle, but current economic circumstances make placement of additional cattle unviable.

	Distance (km)	Area (km ²)	Head	Density
Mt McMinn	14	809	4000	4.9
Lonesome Dove	18	Under care and maintenance		
Flying Fox	32	900	5000	5.6
Hodgson Downs	78	4000	15000	3.8
Moroak	101	2400	25000	10.4

Table 7-2: Summary of key information for a selection of cattle stations in the Project region.

7.3 Conservation and Tourism

Although the region holds great potential, there is little in the way of established tourism ventures or accommodation. A large number of tourist vehicles use the Roper Highway, which is part of the Savannah Way – a drive that links Normanton in Queensland with Broome in Western Australia. The Savannah Way carries tourists through the Limmen National Park and to local attractions such as Tomato Island – a fishing retreat in the Roper River close to Ngukurr and on to the thermal pools near Mataranka. None of the cattle stations along the Highway have tourist accommodation, however proposals for tourist ventures on Mt McMinn have been considered.

Yugal Mangi have constructed a 13 room hotel in Ngukurr and are also considering the development of an interactive tourist drive from Ngukurr, through Numbulwar and north to the Central Arnhem Road near Gapuwiyak (Lake Evella). Members of Urapunga community hold similar ambitions to develop a caravan park and local tourist drives and attractions close to the Project. It is anticipated that if successful, these new developments are likely to increase tourism by 20 – 50% and provide additional sources of income for a considerable length of time.

7.4 Light Industry

Light industry is currently restricted to basic construction services required to maintain and expand communities, or civil and construction works. A range of earthmoving equipment suitable for road upgrades and use at the Project is also available if required. Most of this equipment is located on stations spread along the Roper Highway. In addition, there are plans for horticultural (crop-farming) ventures and an experimental biofuel farm at Ngukurr.

7.5 Mining, Oil and Gas and Exploration

In addition to this Project, there are three other mines. These are the Australian Ilmenite Resources project at Namul-Namul; the Western Desert Resources Iron Ore project at Towns River and the more distant McArthur River lead-zinc mine near Borroloola. North of the Roper River, there is active exploration for diamonds and base metals; and it is anticipated that exploration for shale-oil and gas will occur in a strip north from Ngukurr to Gapuwiyak in 2014.

8.0 Potential Impacts

Development of any project will result in two types of impacts – positive and negative. Positive impacts need to be developed to ensure that the maximum benefit is obtained from each while the negative need to be managed to ensure that the effects of the impacts are mitigated. The risk analysis undertaken in section 3 indicated a number of potential impacts on each of the demographic issues raised in section 6 and 7. These are summarized below.

8.1 Positive Impacts and their management

Sherwin Iron anticipates the Project will be a major contributor to local and regional economies and a moderate contributor to the Northern Territory. Contribution will be primarily economic in nature but will have additional flow-on benefits. The probable outcomes and benefits Sherwin Iron believes will come from the Project are listed in Table 8-1.

Aspect	Demographic	Probable Outcome	Potential Benefits
Mining Operations	Employment	Generation of new business opportunities Engagement of local community people Increased involvement of existing businesses	Decrease in unemployment and underemployment Increase in community and regional income Long-term sustainability and viability of local businesses
	Education	Upskilling of local people through dedicated training	Development of western-style life skills in communities leading to better income management Improved technical skills base for local communities
	Income	Generation of additional sales contracts	Increase in community and regional income and business development opportunities
Influx of Population	Employment	Increase in utilization of local businesses	Decrease in unemployment and underemployment Increase in community and regional income Long-term sustainability and viability of local businesses
	Education	Increased availability of education and school staff Influx of skilled workers	Improvements in long-term education and employment prospects for children Wider range of available skills for use across the region
Personal and Community Income	Health	Improved choices in goods and services Increased availability of health services	Improved health outcomes in communities (e.g. less diabetes and better care)
	Services	Income from agreements Donations from company Company support for developing businesses	Improvements to community systems and infrastructure

Table 8-1: Summary of key information for a selection of cattle stations in the Project region.

It is anticipated that the benefits from the economic stimulus provided by development of the Project will primarily be seen in increased personal income and in the employment sector. If managed well, this can lead to an increase in the overall standard of living and health of community residents. With a positive move towards self-sufficiency through improved local business operations and developments and increased choice, additional benefits from other sectors (e.g. increased regional tourism) may develop.

However, it must be appreciated that while Sherwin iron may be able to provide an economic stimulus, there are limits to its ability to control how the additional income that flows into communities and the region is spent. This creates a host of related risks that are discussed briefly in section 8.2. With this in mind, there are a number of actions that may be put in place to maximize benefits, provide some level of control and therefore some mitigation of risk.

The key management strategies employed will be economic and are summarized in Table 8-2.

Impact	Proposed Strategy	Anticipated outcome
Community and Regional Income	Joint Venture Arrangements	Long-term development of business capacity leading to improved local business management, decreased unemployment and generation of a number of locally operating businesses
		Development of an asset base suitable for securing future income
	Family Trusts	Improved management of income at a family level within the communities
		Development of an asset base suitable for securing future income
	Education	Improvements to community infrastructure in the long-term
		Provision of education aimed at development of money-management skills

Table 8-2: Key management strategies for maximizing the economic benefit from the Project.

It is proposed to manage the positive impacts primarily by encouraging community and individual employment through partnerships governed by Joint Venture agreements linked to sub-contracting opportunities or directly to Sherwin Iron. The key feature of these Joint ventures is provision for traditional owners to acquire equipment, and develop capacity and business acumen in partnership with experienced contractors, enabling them to slowly move from 50% to 100% equity in select sub-contracting opportunities. Using this approach to develop other, non-mining related businesses in local communities (e.g. retail and trade) is also being considered. It is Sherwin Iron's intention to utilise these Joint Ventures in its mining wherever practical and appropriate.

Another strategy being considered involves creation of a number of family trusts designed as repositories for income received through the proposed Joint ventures and other income-generating agreements. The key feature of these trusts will allow economic growth of retained capital, placing traditional owner families in a position where assets will be available to secure additional financial support for purchase of business equipment or construction of private facilities or infrastructure should that be required. However, a process must also be put in place to educate community people in the way the western financial system works and how money should be managed to produce the desired outcomes.

If successful, it is anticipated that a range of Aboriginal owned and operated businesses that will remain viable at least for the length of the mining project will eventually be created. Through this approach, Sherwin Iron believes a platform where nearby communities can become more self-sufficient and sustainable in the foreseeable future can be created. With this should come a greater attractiveness of the region, which in turn may generate additional sources of income.

8.2 Risks and their management

The risk assessment highlighted a wide range of inter-related socio-economic risks. These are presented in Attachment A and some additional detail may be found in the SIMP. A brief overview of the possible outcomes and the potential impacts is provided in Table 8-3.

In general are three types of risk identified:

- i) those related to income generated by the project (e.g. health, crime and services);
- ii) those related to the potential to generate capacity amongst local people to undertake meaningful mine related or business work (e.g. engagement, employment, education, training and business development); and
- iii) those related to infrastructure (and primarily the condition of the Roper Highway).

The income and capacity related risks are likely to be mitigated to varying degrees by successful application of the strategies proposed for management of positive impacts discussed in Section 8.1, however those related to the Roper Highway will require dedicated capital and maintenance expenditure to ensure road conditions are maintained.

Additional mitigation and management measures are proposed in specific performance management plans incorporated into the SIMP. In these plans, the full suite of risks have been categorized according to potential for impact on:

- i) Stakeholder Engagement – which deals with relationships between Sherwin Iron and those impacted by the Project;
- ii) Community Cohesion and Safety – which deals with the important social systems that define and hold families and communities together;
- iii) Community Development (Social Capital) – the intangible infrastructure of a community that define the institutions and relationships within a community such as education and employment; and
- iv) Infrastructure – the physical structures of the community such as roads, building and services.

A summary of the mitigation and management options described in the Social Impact Management Plan is provided in Table 8-4. The management options proposed do not necessarily constitute a company commitment because further investigation and consultation is required to determine the suitability of each. Sherwin Iron intends to use an adaptive strategy for risk management, which means that additional, more suitable options may become evident as the project progresses. Should this occur an analysis of the relative costs and benefits of each option would be undertaken to ensure that the most effective one is implemented.

Aspect	Principal Inherent Risk	Possible Outcomes	Potential Losses
Relationships	Failure to communicate or engage stakeholders	Failure to identify all risks and impacts Alienation Negative relationships Negative relationships	Local business opportunities Future access to additional ore resources Ability to meet employment targets
Health	Increased stress on community services and resources due to influx of people	Increase in community health problems Increase violence placing further pressure on services Fatality	Employee availability may be diminished Temporary closure of the Project with loss of community benefits
Crime	Increased availability of illicit substances or items of value	Decreased work safety Increase in crime	Employee availability is diminished
Training	Inability to develop workplace capacity	Failure to meet employment targets Failure to develop Joint Ventures	Community benefits are reduced Employment resource is reduced Sustainable futures may no longer be possible
Services	The mine creates supply shortages in local communities	Decreased in choices at community level leading to potential increase in health issues Increased local inflation	Decrease in value of some community benefits from agreement
Infrastructure	Road conditions not suitable for ore transport	Vehicle accidents or fatality	Temporary closure of the Project with loss of community benefits

Table 8-3: Primary socio-economic risks anticipated from the Project.

Aspect	Management Options	Anticipated outcome(s)
Relationships	Management through the Stakeholder Engagement Plan	Durable and positive working arrangements that maximize outcomes to local communities Lasting trust with local Aboriginal people leading to further access to land for mining Social Licence to Operate Adequate two-way communication between the mine and the local community
Health	Establishment of emergency procedures that work in conjunction with community health clinics.	A rapid response system that minimises impacts on available health services in the event of a major incident or catastrophe
	Establishment of company policies and procedures that create a safe working environment.	A safe working environment leading to minimal lost time injuries or harm to workers or members of the general public who may be impacted by the mine's operations.
	Provide assistance to community health clinics to maintain equipment and readiness	Provision of an increased quality of care in health clinics located within local communities
Training	Development of targeted training programs in conjunction with lead contractors	A skilled workforce that is capable of meeting company requirement over the long term and can transfer those skills to other mining ventures that may develop in the region Engagement of large numbers of local Aboriginal people (up to 30% of the workforce)
Services	Joint Venture arrangements with selected local community businesses	More robust retail industry in local communities that provide a wider range of choices Additional income is generated to community businesses through JV and subcontracting for supplies and services (e.g. fuel) through community stores and businesses
Infrastructure	Upgrading of the Roper Highway Assessment of alternative options for transport of ore	High quality, efficient systems for transport of ore that create a low risk to the general public

Table 8-4: Management options for principal inherent risks associated with socio-economic impacts.

8.3 Management beyond the life of mine

Historically, it is difficult to maintain positive outcomes from major projects such as mining, leading to a significant risk of adverse socio-economic conditions once a mine has ceased to operate. It is as difficult to determine how to best manage for this eventuality during the development phase of the mine. Nevertheless, Sherwin Iron's approach is geared towards maximizing the development of sustainable, long-term outcomes for local communities in an endeavor to minimise the impacts that might arise following eventual closure of the mine. The intention is, as far as is possible, to create a platform where positive strategies and outcomes outlast the life of the mine and continue to generate economic benefits for communities well into the future.

To achieve this, a flexible and adaptive risk management strategy has been employed. This strategy and its management options will be continually re-assessed as the project develops and throughout its operational life, to ensure that whatever positive outcomes are generated can be sustained and meet the expectations of local communities and their plans for the future.

A number of opportunities existing in the current environment already warrant further investigation as targets for specific, focused long-term outcomes. This includes the tourism industry, which might benefit from improved regional infrastructure and local business development (e.g. mechanical workshops and tourist accommodation). Additionally, Sherwin Iron may elect to investigate the possibility of developing other infrastructure such as large capacity alternative power generation stations or dams that could continue to service local communities and towns following closure of the mine.

10.0 References

Australian Bureau of Statistics (2006)

Australian Bureau of Statistics (2012)

Ecoz Environmental Service (2012): Western Desert Resources Environmental Impact Statement, Chapter 8: Social Aspects.

Ecoz Environmental Service (2012): Western Desert Resources Environmental Impact Statement, Appendix G – Social Impact Assessment.

International Electrotechnical Commission (2009): IEC/ISO 31010 International Standard: Risk management – Risk assessment techniques.

Li SQ, Pircher SLM, Guthridge SL, Condon JR, Wright AJ. Hospital Admissions in the Northern Territory 1976 to 2008. Department of Health, Darwin, 2011

Measey ML, Li SQ, Parker R. *Suicide in the Northern Territory 1981–2002*. Department of Health and Community Services, Darwin, 2005.

Northern Territory Government (2011): Jobs Profile 2011 – Ngukurr.

Sherwin Iron (NT) Pty Ltd (2011): Statement under section 46(1) Aboriginal Land Rights (Northern Territory) Act regarding application for grant of mining interest.

Taylor J., Bern J. and Senior K.A. (2000): Ngukurr at the millenium: a baseline profile for social impact planning in south-east Arnhem land; *Centre for Aboriginal Economic Policy Research, Australian National University, Canberra, Research Monograph No. 18*.

Vanclay F. (2003): International Principles for Social Impact Assessment; *Impact Assessment and Project Appraisal*, 21 (1), 5 – 11.

VDM Consulting (2011): Australian Ilmenite Resources Public Environmental Report: Appendix D – Social and Cultural Aspects Report 2012, Darwin, Australia.

VDM Consulting (2011): Hodgson Downs Mining Area Iron Ore Project – Notice of Intent, Darwin, September 2011, 52pp

Attachment A: Outcomes of Regional Risk Assessment

Risk	Aspect	Potential Impact/Hazard	Inherent Risk			Management Measures	Residual Risk		
			Consequence	Likelihood	Risk		Consequence	Likelihood	Risk
Community Cohesion and Safety	Contaminants or dust	Increased pressure on community health services	2	B	L	Environmental systems and measures will be in place to reduce large volumes of dust or contamination of local potable water supplies.	1	A	L
	Separation of Aboriginal workers from their families	Mental health issues	2	A	L	Develop systems and processes that encourage short-term family visits to the camp. Consider short-term rosters for Aboriginal people (e.g. 1 week on/1 week off) with job-sharing and pooling.	2	A	L
		Project unable to retain workers	3	C	M				
	Ceremonial requirements	Project unable to retain workers	3	C	M	Work rosters will be developed that provide for timeto attend ceremonial duties. This may include week on/ week off rosters, job-sharing or a pool of employees.	3	B	L
	Alcohol and drugs	Increased health issues	3	C	M	Alcohol types and quantities will be controlled at the mine's wet mess. There will also be routine testing of blood alcohol and drug levels, with zero tolerance in the workplace.	3	B	L
		Increased crime							
	Transport of ore	Vehicle accidents with the potential to cause death	5	C	H	Regular maintenance of the Roper Highway in conjunction with transport protocols and procedures (e.g. trucks in convoys with escorts). Alternative options for transport of ore (e.g. construction of a dedicated haul road, barging or rail transport) will be considered.	5	A	M
Community Infrastructure and Services	Influx of Aboriginals from other communities	Increased pressure on infrastructure and services	2	D	M	Transport to and from the camp and accommodation at the camp will be made available for Aboriginal workers.	1	B	L
	Influx of non-Aboriginals into communities	Increase in transmissible diseases	2	B	L	All non-Aboriginal workers will be flown into and out of Minyerri or Ngukurr and transported to and from site. Accommodation will be provided at site effectively isolating workers from communities.	2	A	L
		Increased pressure on infrastructure and services	2	A	L		1	A	L
		Disruption to Aboriginal customary activities	3	C	M	Cultural awareness training will be provided to all workers	2	B	L
	Injury or illness	Increased pressure on community health services	2	B	L	On-site first aid facilities and medical evacuation protocols and procedures. Upskilling of local community health workers and upgrade of facilities will be considered.	1	A	L
	Goods and services	Mine requirements create shortage of supply to communities	3	B	M	An on-site store may be constructed or all goods will be provided by special contract through selected community stores.	2	A	L
Economic	Resumption of land	Reduction in cattle carrying capacity leading to loss of station income	1	E	M	The amount of land being mined will be minimised. Progressive rehabilitation will return land to cattle agistment.	1	C	L
	Income from ore sales	Decline in income leading to loss of community income	3	B	M	Procurement of long-term contracts for the sale of ore. Identification of additional resources including resources that can be benefited. Improved management and mining practices to reduce ore production costs.	3	A	L
		Decline in income leading to decrease in employment levels							
	Early closure of project	Programmes that have commenced are unable to be completed	3	C	M	Development of a plan for early closure with a focus on contingencies to be employed while developing programmes beneficial to the community.	2	B	L
		Unsustainable future for community	4	B	M	During the early part of the project assist with development of local businesses that can cater to other users (e.g. mechanical services, tourism).	3	B	L
	Stratification of wealth	Increase in petty theft and income related crimes	2	B	L	Creation of community and family trusts with appropriate legal controls to reduce amounts of available cash.	2	A	L
Land Use	Resumption of land	Reduced access for recreational hunting and fishing	1	B	L	Mining will occur only on top of the mesas, well away from plains and rivers.	1	B	L
		Reduction in aesthetic appeal of environment	1	B	L	Mining will occur at a distance from the Roper Highway and will be hidden from view by large areas of vegetation. Mining will occur in phases and progressive rehabilitation will ensure that the area of disturbed land will remain at a minimum.	1	B	L
	Unauthorised access to land	Loss of access to future deposits	4	B	M	Cultural awareness training will be provided to all workers and protocols for access to land and communities will be developed.	3	B	M
Stakeholder Engagement	Participation of stakeholders	Alienation of stakeholders	3	C	M	Sherwin Iron will engage a social and cultural liaison to maintain contact with stakeholders throughout the duration of the Project. Liaison Committee meetings with Aboriginal people will be undertaken on a regular basis.	3	A	L
		Loss of business opportunities	2	C	M		2	A	L
		Failure to meet employment targets	3	C	M		3	A	L
		Failure to identify all impacts	3	C	M		3	A	L
	Communication	Poor communication leading to negative relationships	2	D	M	Regular and ongoing face-to-face communication will be undertaken with all stakeholders. A website has been developed to allow for two-way communication and passage of information.	2	B	L
	Expectations	Negative relationships with stakeholders develop if expectations are not met	3	C	M	Regular communication between Sherwin iron and stakeholders to ensure that expectations are known and are realistic. An annual allocation of monies for stakeholder projects will be made to ensure that those accepted are being addressed.	2	B	L
Workforce	Community workforce and skills	Decrease in number of skilled workers retained by communities	3	C	M	Education and training in a number of areas beneficial to both Sherwin iron and the community will be provided. This should enable a pool of skilled people to be developed for use at the mine or in communities.	3	B	M

Risk	Aspect	Potential Impact/Hazard	Inherent Risk			Management Measures	Residual Risk		
			Consequence	Likelihood	Risk		Consequence	Likelihood	Risk
Failure to comply with NTASS Act	Unintentional or deliberate unauthorised entry to sacred site	Alienation of traditional Aboriginal owners	3	4	H	Ongoing engagement with traditional Aboriginal owners	3	2	M
		Loss of future access to land	4	3	H	Employees will be made aware of responsibilities to abide by legislation	4	2	M
		Temporary closure of Project	4	2	M	Mining Plans will be prepared such that all sites are avoided	4	1	L
		Permanent closure of Project	5	1	M		5	1	M
		Spiritual discomfort to traditional Aboriginal owners	3	4	H		3	2	M
		Court imposed penalties affecting economic viability of Project	3	1	L		3	1	L
	Mining Operations	Damage to site	3	3	M	Sites will be demarcated prior to work commencing	3	1	L
						Buffer zones will be provided around sites Mining Plans will be prepared such that all sites are avoided			
Failure to comply with Heritage Act	Unauthorised entry to heritage site	Removal of cultural objects	3	3	M	Ongoing engagement with traditional Aboriginal owners	3	2	M
		Destruction of archaeological or historic materials	5	2	H	Employees will be made aware of responsibilities to abide by legislation	5	1	M
		Court imposed penalties affecting economic viability of Project	3	1	L	Mining Plans will be prepared such that all sites are avoided	3	1	L
		Temporary closure of Project	4	2	M	Site locations will not be made public	4	1	L
		Permanent closure of Project	5	1	M	A site register will be prepared and maintained	5	1	M
	Mining Operations	Damage to site	3	2	M	Sites will be demarcated prior to work commencing	3	1	L
						Buffer zones will be provided around sites Mining Plans will be prepared such that all sites are avoided			
Loss of contemporary culture	Language	Language is lost	5	2	H	Language recording project	5	1	M
		Traditional Knowledge is lost	5	2	H	Keeping placemuseum for artefacts	5	1	M
			5	2	H	Traditional Knowledge recording project	5	1	M
	Traditional Environmental Knowledge	Closure and rehabilitation outcomes are unacceptable to traditional Aboriginal owners (landowners)	3	2	M	Traditional Knowledge recording project	3	1	L
		Opportunities for locally acceptable Land Management practices may be lost	2	3	M	Traditional knowledge applied during progressive rehabilitation	2	2	L
Loss of control over proprietary cultural information	Traditional Knowledge	Potential future business opportunities are lost	3	2	M	Intellectual Property Management Agreement	3	1	L
		Application of aspects of traditional knowledge to environmental management may be precluded	3	2	M	Patent applications if and where practical	3	1	L



APChem

Scientific Consultants
ABN: 41 344 037 125

Howard David Smith
Principal Scientist

8/28 Woods Street, Darwin, 0800
Northern Territory, Australia
Tel: +61 40400857456
drhowardsmith@gmail.com

REPORT 2013/004

Prepared by APChem Scientific Consultants for Sherwin Iron Limited.

Information contained within this report may be reproduced in whole or in part subject to inclusion of the acknowledgement of the source and provided no commercial usage or sale of the material occurs. Reproduction for purposes other than those given above requires the written permission of Sherwin Iron Limited.

Requests for Permission should be sent to:

Sherwin Iron Limited
4/4 Shepherd Street
Darwin, 0800
Northern Territory
Australia

Recommended Citation: Smith H.D. (2013): Economic and Social Impact Assessment: Sherwin Creek Iron Ore Project: Sherwin Iron Limited; APChem Scientific Consultants, Darwin, Australia.

30 September 2013

Sherwin Iron Limited
4/4 Shepherd Street
Darwin, NT, 0800

