

# What Students Want

Career Drivers, Expectations and Perceptions of  
Mining Engineering and Minerals Processing Students.



# Table of Contents

Tables	iii
Figures	iii
List of abbreviations	iii
Acknowledgements	iv
<b>Executive Summary</b>	<b>v</b>
Key findings	v
Implications for industry	vi
<b>1 Introduction</b>	<b>1</b>
1.1 Background	1
1.2 Objectives	1
<b>2 Research Method</b>	<b>2</b>
2.1 Literature review	2
2.2 The survey	2
2.3 Methodological Issues	2
<b>3 Survey Findings</b>	<b>4</b>
3.1 Participant profile	4
3.2 Motivations	5
3.3 Perceptions of the industry	6
3.4 Career plans	8
3.5 Shorter stayers v. longer stayers	10
3.6 Suggestions for attracting more students	13
<b>4 implications for industry</b>	<b>14</b>
4.1 Attraction	14
4.2 Retention	15
<b>5 Conclusion</b>	<b>17</b>
5.1 Attraction strategies	17
5.2 Retention strategies	17
5.3 Industry challenges	17
<b>6 References</b>	<b>18</b>
<b>7 Appendix 1: Questionnaire</b>	<b>19</b>
<b>8 Appendix 2: Analyses of Shorter v. Longer Stayers</b>	<b>29</b>

## Tables

Table 1: Gender profile of responses from participating universities	4
Table 2: Age profile of respondents	4
Table 3: Current course of study	4
Table 4: Current year of study	5
Table 5: Exposure to the minerals industry	5
Table 6: Reasons for choosing current course of study	6
Table 7: General perceptions of the minerals industry	7
Table 8: Personal qualities required for successful career	8
Table 9: Student intentions on completion of current study program	8
Table 10: Factors influencing career choice	9
Table 11: Student intentions to stay in the minerals industry	10
Table 12: Shorter and longer stayers' perceptions of the minerals industry	12
Table 13: Shorter and longer stayers' career aspirations and expectations	12

## Figures

Figure 1: Negative perceptions of the minerals industry	7
Figure 2: Career aspirations and expectations	9
Figure 3: Intended length of stay in the minerals industry	10

## List of abbreviations

ABS	Australian Bureau of Statistics
AusIMM	Australasian Institute of Mining and Metallurgy
CBSR	Colmar Brunton Social Research
CSRM	Centre for Social Responsibility in Mining
DEST	Department of Education, Science and Training
DETYA	Department of Education, Training and Youth Affairs
MCA	Minerals Council of Australia
MTEC	Minerals Tertiary Education Council
NILS	National Institute of Labour Studies
OfW	Australian Government Office for Women
QRC	Queensland Resources Council
SPSS	Statistical Package for Social Sciences
UQSRC	University of Queensland Social Research Centre
WIMnet	Women in Mining Network
WiSER	Women in Social and Economic Research

## Acknowledgements

The Centre for Social Responsibility in Mining (CSRМ) would like to thank the staff and students at The University of Queensland, The University of New South Wales, Curtin University of Technology (Western Australian School of Mines) and Murdoch University who contributed to this study.

We are grateful to the Australian Government Office for Women (OfW) and the Minerals Council of Australia (MCA) for jointly funding the research on which this report is based.

## Authors

Tian Zhang

Mary Anne Barclay

## Research Team

Mary Anne Barclay (Project Manager)

Dr Cath Pattenden

Professor David Brereton

Dr Deanna Kemp

Tian Zhang

## Centre for Social Responsibility in Mining

CSRМ is a member of the Sustainable Minerals Institute

Director: Professor David Brereton

# Executive Summary

This report presents findings from a survey of students in minerals-related programs. The survey was designed to investigate the factors that influence students' course and career choices, their impressions of the minerals industry and their career goals and expectations. The aim of the research project was to determine the impact of personal goals and career aspirations on the students' intentions to undertake careers in the minerals industry. A secondary research aim was to determine the effectiveness of current industry recruitment strategies to attract and retain students to the minerals industry for the longer term.

The survey was distributed to second, third and fourth year students enrolled in mining engineering and minerals processing programs at The University of Queensland, The University of New South Wales, Western Australian School of Mines (Curtin University of Technology) and Murdoch University. A total of 329 students completed the survey.

## Key Findings

### Profile of respondents

- Of the total sample, 84% were male and 16% female.
- More than two-thirds (67%) of students were single and only nine (3%) had dependent children.
- A large proportion of students (41%) were in receipt of a scholarship or cadetship.
- Most students had some form of experience with the minerals industry with 64% having been on field trips and 58% having gained work experience through vacation employment with a mining company.
- Around 60% had family or friends who worked in the industry.

### Motivations for choosing a mining career

- The most common reasons for choosing to study mining-engineering/ minerals-processing degrees were:
  - to be equipped for a career in the minerals industry (79%)
  - to learn about the minerals industry (68%)
  - opportunities for vacation employment (55%).
- Publicity surrounding the current resources boom appears to have impacted primarily on younger students.

### Perceptions of the industry

- Students had generally positive views of the industry. The majority saw it as:
  - having many job opportunities (91%)
  - safety conscious (87%)
  - an exciting place to be working (83%)
  - technologically advanced (80%).
- To a lesser extent, they also regarded the industry as:
  - environmentally responsible (62%)
  - socially responsible (58%).
- The aspects of the industry that were seen as most unattractive related to difficulties in balancing career demands with personal relationships and family commitments.
- More than 90% of students believed that it was important to be prepared to work long hours in the industry and to work in remote locations if they were to have successful careers.

### Career plans and expectations

- Nearly all respondents (94%) were planning to work in the mining industry after graduation.
- The three most important reasons for choosing a career in the industry were:
  - earnings potential (88%)
  - being able to use strengths (85%)
  - job security (83%)
- Career expectations included:
  - work-life balance (89%)
  - rapid career advancement (79%)
  - travel opportunities (78%)
  - job and career flexibility (51-60%)
- Less than half the students (40%) intended working in the minerals industry for all, or most of, their working lives; around one quarter (24%) were planning to work in the industry for ten years or less.

## Shorter stayers v longer stayers

Respondents who were planning to spend ten years or less in the industry (shorter stayers) had a less positive view of the industry than those identified as longer stayers. Longer stayers were significantly more likely than shorter stayers to regard the minerals industry as:

- safety-conscious
- exciting
- technologically advanced
- environmentally responsible
- socially responsible
- committed to equal opportunity.

Conversely, shorter stayers were significantly more likely to agree that:

- working in the industry is difficult for those who have a family
- the lack of social life is unattractive
- working in remote locations is unattractive
- working in the industry is dirty
- working in the industry is tough for women
- the masculine culture of the industry is unattractive
- sexual harassment is a problem
- there is no job security.

## Suggestions for attracting more students

Respondents suggested that the most effective ways of attracting more students to the industry were:

- providing secondary school students with greater exposure to the industry
- improving the image of the industry.

## Implications for industry

Factors identified as most likely to attract students to the industry were:

- the provision of greater opportunities for vacation employment
- using existing networks of employees to attract family members and friends into the industry
- targeting secondary schools more effectively in order to widen the talent pool
- supporting initiatives such as the government's Careers Advice Australia (CAA) Network, which provides advice on career transition for secondary students
- continued marketing efforts to improve the image of the industry
- addressing equity issues in the minerals industry workforce to make it a more appealing career option for women.

Factors identified as most likely to improve retention rates were:

- the introduction of more flexible working hours to assist with work-life balance
- career development plans and opportunities for career advancement
- managing students' expectations, particularly in relation to the likely duration of the industry's current growth cycle, so they do not become disillusioned with the industry
- facilitating intra-company movement to maintain interest
- the opportunity to travel.

The biggest challenge for industry was identified as its ability to adapt its policies and practices to include people who do not match the traditional industry profile but are attracted to careers in the industry. This study has identified two groups who could significantly broaden the talent pool if industry practices were adapted to meet their needs. These are women and those identified in the study as shorter stayers.

# 1 Introduction

This report presents the findings from a survey of students enrolled in mining-related subjects in four Australian tertiary institutions belonging to the Minerals Tertiary Education Council (MTEC). The survey data were originally collected as part of a larger study on the attraction and retention of females into the Australian minerals industry, commissioned by the Minerals Council of Australia (MCA) and the Federal government's Office for Women (OfW). Although the focus of the original study was on female attitudes and expectations, the survey was designed to gather information from both male and female students so that other research relating to attraction and retention issues could also be conducted.

## 1.1 Background

The Australian minerals industry is currently enjoying economic boom conditions, where opportunities for further development are being constrained by a lack of suitably qualified and skilled employees. There is a shortage of skilled tradespersons and professionals across all industries in Australia, which is particularly acute in the minerals industry (Lowry et al., 2006). In a recent survey of minerals industry professionals, 40% of respondents identified the shortage of skilled personnel as the most important issue facing the minerals industry in Australia (CSR and UQSRC, 2006).

According to research undertaken by the National Institute of Labour Studies (NILS), it is likely that the industry will need to recruit an additional 7,700 professionals over the next 10 years (Lowry et al., 2006). While there is evidence of an increasing uptake of engineering by students at the tertiary level (MTEC, 2006; DETYA, 2001; DEST, 2007), a range of industry reports and academic studies attest to the high turnover rates in the minerals industry workforce (e.g. ABS, 2001; Rowland Communications, 2004; CSR and UQSRC, 2006).

There are two ways of addressing these skills shortages: recruiting more people into the workforce and retaining the services of current employees. The focus of this research is on identifying the factors that are likely to attract students to mining-related degrees and to retain their services once they graduate.

## 1.2 Objectives

The objectives of this report are to:

- identify the career expectations of students currently enrolled in mining engineering and minerals processing degrees
- understand their personal motivations
- identify their attitudes towards the minerals industry
- determine which industry recruitment initiatives are most attractive to students
- identify factors that will encourage them to stay in the industry.

## 2 Research Method

The research method for this project consisted of a literature review and the development, implementation and analysis of survey of students undertaking mining engineering and minerals processing degrees.

### 2.1 Literature review

A literature review was conducted on workforce attraction and retention in the minerals industry. The purpose of this review was to identify the major issues relating to the retention of professionals in the industry and to determine the likely impact of personal factors, such as career ambitions and attitudes towards the industry, on students' longer-term career goals and choices. The literature review encompassed:

- industry reports
- academic literature and research reports
- statistical data from the Australian Bureau of Statistics (ABS), Department of Education, Science and Training (DEST; formerly the Department of Education, Training and Youth Affairs (DETYA)), NILS and university records.

### 2.1 The survey

#### 2.1.1 Sample selection

Participants consisted of 329 students studying undergraduate degrees in mining engineering or minerals processing at four MTEC Universities: The University of Queensland, The University of New South Wales, Curtin University of Technology (including the Western Australian School of Mines campus at Kalgoorlie) and Murdoch University. Participation was restricted to second, third and fourth year students. First year students were excluded from the survey because The University of Queensland has a common first year for all engineering students and they are not required to select their area of specialisation until the second year.<sup>1</sup>

At each campus, one staff member took responsibility for overseeing the distribution of the survey and collecting all of the completed surveys and mailing them back to the Centre for Social Responsibility in Mining (CSRSM). The instructions were to

---

<sup>1</sup> The MTEC initiative also covers Earth Sciences at several universities. Students enrolled in these programs were not included in the current study as Earth Sciences is more of a generalist degree than a qualification specifically tailored to working in the minerals industry.

distribute the survey to classes which: (a) were notionally attended by all students in that year of the program; and (b) contained at least one female student. Surveys were distributed, filled out and collected during the designated lecture period. Students who were absent from class on that day were excluded from the sample collection.

#### 2.1.2 Survey design and analysis

The survey was designed to investigate the following issues:

- the career plans of students currently enrolled in mining engineering and minerals processing degrees
- their personal motivations
- their perceptions of the minerals industry.

The questionnaire took approximately 15 minutes to complete and comprised mainly closed response questions. A copy of the questionnaire is reproduced in Appendix 1. Survey responses were analysed using Statistical Package for Social Sciences (SPSS) software to obtain basic frequencies and to test for significance.

#### 2.1.3 Informed consent

Ethical approval was obtained from The University of Queensland for this study. Approval was provisional on obtaining informed consent from all participants prior to collecting data. Background information on the study was provided to all students and they were advised that participation in the study was strictly voluntary and that their responses would be treated as confidential.

Students were then asked to indicate their consent regarding the voluntary nature of their participation on the survey document. Completed surveys were placed in a sealed envelope and returned to CSRSM for processing.

## 2.2 Methodological Issues

### 2.2.1 Representativeness

The study used a large sample size and included students from multiple universities. Therefore the findings should be broadly representative of the views of students enrolled in mining engineering and minerals processing degrees. However, there are a few things to note when interpreting the findings.

The current study focuses on students in specialised mining-related courses at universities. Therefore, it is neither representative of the larger group of students undertaking science or engineering degrees who are potential industry employees, nor those studying mining-related subjects at other tertiary institutions such as TAFE.

In addition, the questionnaires were distributed only to classes with at least one female, so there may be a slight over-representation of females. First-year students were also excluded, meaning the sample consisted of later year students who, presumably, would already be pursuing a career in the minerals industry. Therefore, there may be a selection bias present, as students who are positively inclined towards the minerals industry and perceive that they have the qualities to be successful in it, would be more likely to enrol and stay in mining-related programs. Those that do not perceive themselves to be successful in the minerals industry would tend to drop out or choose different courses.

### **2.2.2 Reporting of differences**

A significance level of .05 was used for all the analyses, consistent with standard research practice. This means that there is less than 5% likelihood that the results were obtained by chance or random fluctuations.

# 3 Survey Findings

The survey findings are divided into five topic areas:

- Participant profile: basic demographics and current study situation of participants.
- Motivations: participants' reasons for choosing their current course of study.
- Perceptions of the industry: respondents' perceptions of the attractive and unattractive aspects of a career in the minerals industry as well as the personal qualities deemed necessary to be successful in it.
- Career aspirations and expectations: how respondents see their careers developing.
- Shorter stayers v. longer stayers: perceptions of the industry and personal motivations that may impinge on participants' decision to stay or leave the industry.

- based on their age profile, it can be seen that the majority of students commenced university directly or shortly after completing their secondary education.

Table 2: Age profile of respondents

Age (years)	Percentage
18	7.0
19	28.9
20	25.8
21	17.3
22	6.7
23	4.9
24	2.7
25 or more	6.7

N = 329.

## 3.1 Participant profile

### 3.1.1 Gender

Of the 329 students that completed the survey, 84% were male and 16% were female (one was unidentified). The breakdown of responses by each institution is shown in Table 1.

Table 1: Gender profile of responses from participating universities

University	Males	Females
UQ	114	25
Curtin	83	17
UNSW	77	8
Murdoch	3	1
Total	277	51

### 3.1.2 Age

As illustrated in Table 2:

- respondents ranged in age from 18 to over 24 years
- the majority (79%) were 21 or under

### 3.1.3 Family and relationships

- More than two thirds of the students (67%) were single.
- Nine respondents (3%) had dependent children.
- Four respondents (1%) identified as being Aboriginal or Torres Strait Islander.
- 60% reported that they had family or friends who worked in the minerals industry.

### 3.1.4 Course of study

Approximately three-quarters of students (76%) were studying mining engineering, while 16% were studying minerals processing/metallurgy (Table 3).

Table 3: Current course of study

Program of study	Percentage
Mining engineering	75.5
Minerals processing/Metallurgy	16.0
Other	8.6

N = 326.

Participants' year of study are presented in Table 4. The concentration of students in the earlier years of their degree is consistent with MTEC (2006) data showing that the number of students enrolling in minerals processing and engineering courses has increased in the last two years. This increase most likely reflects the impact of the current mining boom.

Table 4: Current year of study

Year of study	Percentage
2nd year	39.9
3rd year	34.5
4th year	13.7
Other	11.9

N = 328.

### 3.1.5 Financial support

A considerable percentage of students (41%) were in receipt of a scholarship or cadetship. This indicates that the minerals industry is currently making extensive use of this strategy to attract and retain high calibre students.

### 3.1.6 Exposure to the minerals industry

Most students had some form of exposure to the minerals industry (Table 5). The majority of respondents had:

- been on field trips/site visits during their course (64%)
- friends or family working in the minerals industry (60%)
- vacation experience with a mining or minerals processing company (58%).

Table 5: Exposure to the minerals industry

Type of exposure	Percentage
Field trips/site visits during course	63.8
Friends or family in minerals industry	60.2
Vacation experience	57.8
Previously worked in industry	6.4
No prior experience	13.4

N = 329.

Generally, the longer respondents had been studying, the greater their exposure to working in the minerals industry<sup>2</sup>.

## 3.2 Motivations

A major objective of the project was to understand the motivations of students undertaking specialised minerals-related courses, such as mining engineering and minerals processing.

### 3.2.1 Study choices

Students most commonly cited the following reasons for choosing their current course of study (Table 6):

- to equip them for a career in the minerals industry (79%)
- to learn about the minerals industry (68%)
- opportunities for vacation employment (55%)
- the opportunity to study subjects they were good at (50%).

<sup>2</sup> Year of study was negatively correlated with having no prior experience in the minerals industry ( $r = -.27, p < .001$ ).

### Participant profile

- Of the total sample, 84% were male and 16% female.
- More than two-thirds (67%) of students were single and only nine had dependent children.
- A large proportion of students (41%) were in receipt of a scholarship or cadetship.
- Over half (58%) had done vacation experience work with a mining company and 64% had been on field trips.
- Around 60% had family or friends who worked in the industry.

## Motivations

- The most commonly cited reasons for choosing to study mining engineering/ minerals processing degrees were:
  - to be equipped for a career in the minerals industry (79%)
  - to learn about the minerals industry (68%)
  - opportunities for vacation employment (55%).
- Vacation employment was seen as a greater motivator than financial support such as scholarships and cadetships.
- Publicity surrounding the current resources boom appears to have impacted primarily on younger students

Table 6: Reasons for choosing current course of study

Reasons for choosing course*	Important (%)
To equip them for a career in minerals industry	78.6
To learn about the minerals industry	67.9
Opportunities for vacation employment	55.1
Study subjects they are good at	49.7
Availability of financial support	32.1
Encouragement from friends and family	29.2
Publicity about the resources boom	29.1
Career guidance at school/university	16.7

Note: number of responses varied between 322 and 327 participants.

Opportunities to undertake vacation work were a major influence in course selection, being cited as an important factor by 55% of respondents. This factor was given a higher rating than the availability of financial support in the form of scholarships or cadetships (32%). However, financial assistance was still a significant incentive for those who held scholarships or cadetships.<sup>3</sup>

Many students (29%) regarded publicity about the resources boom as a motivating factor in their decision to study mining engineering or minerals processing. Students in the early stages of their courses were more likely to be influenced by publicity about the resources boom than students in their final years<sup>4</sup>.

3 An independent-groups ANOVA revealed that scholarship and cadetship holders ( $M = 3.17, SD = 1.24$ ) were significantly more likely than non-holders ( $M = 2.27, SD = 1.29$ ) to indicate that the availability of financial support was an important reason for choosing their course ( $F(1,324) = 39.97, p < .001$ ).

4 Year of study was negatively correlated with being influenced by publicity about the resources boom ( $r = -.15, p = .011$ ).

At the other end of the scale, few students identified career guidance at school or university as a significant influence on their study choices. In fact, the majority (57%) indicated it was not influential in determining their career choices. This finding is supported by the Women in Social and Economic Research (WiSER) survey of first year students undertaking minerals-related courses at Western Australian universities (Lord et al., 2007).

## 3.3 Perceptions of the industry

### 3.3.1 General impressions of the minerals industry

Generally, respondents had a very positive view of the minerals industry (Table 7). In particular, students thought the industry provided a stable career. The majority of respondents:

- agreed that there are lots of job opportunities in the minerals industry at present (91%)
- disagreed that there is no job security in the industry (68%).

The majority also agreed that the minerals industry was:

- safety conscious (87%)
- an exciting place to be working (83%)
- technologically advanced (80%).

Table 7: General perceptions of the minerals industry

Perceptions of the minerals industry	Agree (%)
<b>Positive attributes</b>	
Lots of job opportunities at present	90.5
Safety conscious	86.6
Exciting to be working in	82.6
Technologically advanced	80.2
Environmentally responsible	61.6
Socially responsible	58.2
Values entrepreneurship	49.4
Committed to 'equal opportunity'	48.9
<b>Negative attributes</b>	
Difficult place to work if you have a family	47.0
Dirty	33.2
Tough for women	32.4
Conservative	26.6
Sexual harassment is a problem	14.3
No job security	9.8

Note: number of responses varied between 327 and 328 participants.

While students were very positive about mining as an exciting career opportunity, they were less certain about the industry's

social and environmental performance, possibly reflecting an awareness of broader community concerns about the impact of mining on the environment and on communities. To a lesser extent, students agreed that the industry was:

- environmentally responsible (62%)
- socially responsible (58%).

Students were unsure about the minerals industry's commitment to equal opportunity and management of sexual harassment. For example, approximately half of all respondents:

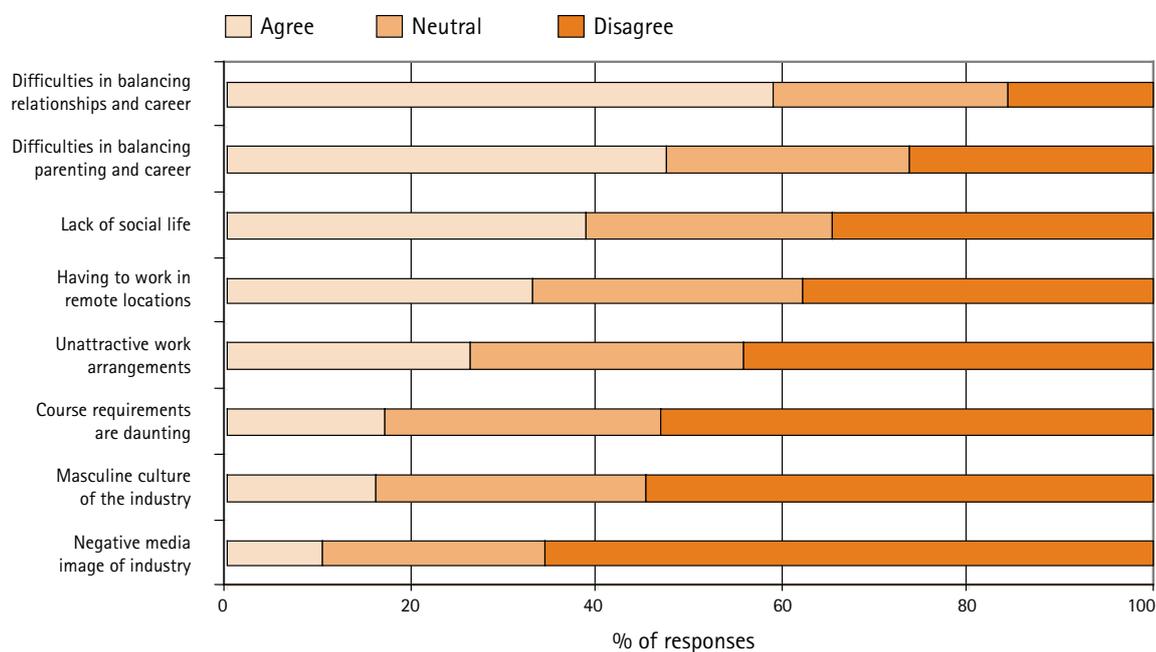
- agreed that the industry was committed to equal opportunity (49%; 14% disagreed, 37% neutral)
- disagreed that sexual harassment was a problem, that is, thought that sexual harassment was not a problem (51%; 14% agreed, 35% neutral)
- disagreed that the masculine culture of the industry was unattractive (55%; 16% agreed, 29% neutral; Figure 1).

### 3.2.2 Unattractive aspects

The most unattractive aspects of a career in the minerals industry were those that interfered with personal relationships. These included (Figure 1):

- difficulties balancing relationships and career (59%)
- difficulties balancing parenting and career (47%).

Figure 1: Negative perceptions of the minerals industry



Note: number of responses varied between 321 and 326 participants.

### Perceptions of the Industry

- Students had generally positive views of the industry. The majority saw it as:
  - having many job opportunities (91%)
  - safety conscious (87%)
  - an exciting place to be working (83%)
  - technologically advanced (80%).
- To a lesser extent, they also regarded the industry as:
  - environmentally responsible (62%)
  - socially responsible (58%).
- The aspects of the industry which were seen as most unattractive related to the difficulty of balancing career demands with personal relationships and balancing work and parenting commitments.
- More than 90% of students believed that it was important to be prepared to work long hours in the industry and to work in remote locations if they were to have successful careers.

### 3.3.3 Personal qualities

While some students considered working in remote locations and other work arrangements to be unattractive (Figure 1), the majority of students nevertheless accepted these as part of the job. When asked about the personal qualities required for a successful career in the minerals industry, more than 90% thought that it was important to be (Table 8):

- willing to work in remote locations (92%)
- prepared to work long hours (92%).

Table 8: Personal qualities required for successful career

Personal qualities	Important (%)
Being willing to work in remote locations	91.8
Being prepared to work long hours	91.5
Being a team player	90.8
Liking a challenge	88.7
Being confident and self-sufficient	85.7
Strong desire to prove yourself	67.7
Being emotionally strong	66.6
Having a supportive partner/spouse	65.3
Being prepared to put your career first	53.5

Note: number of responses varied between 327 and 329 participants.

## 3.4 Career plans

### 3.4.1 Plans on completion of current study program

Almost all of the students (94%) were planning to undertake a career in the minerals industry following graduation (Table 9). This is not surprising, given that they were enrolled in programs that had a strong vocational focus. Most intended to work for a mining company (86%) rather than for a contractor (8%) or a consulting firm (5%).

A small percentage of respondents (5%) intended to undertake further study while six percent were unsure about their future plans.

Table 9: Student intentions on completion of current study program

Option	Percentage
Work in minerals industry	94.2
Work for mining company	85.7
Work for contractor	8.2
Join consulting firm	4.6
Undertake further study	5.2
Return to previous employer	2.1
Work in another industry	2.1
Unsure	6.1
Other	1.8

Note: Number of responses varied between 327 and 329 participants. Some students gave more than one answer.

Table 10: Factors influencing career choice

Factor	Important (%)
Earnings potential	88.4
Use strengths	84.8
Job security	82.6
Opportunity for rapid career advancement	79.3
Travel opportunities	78.1
Challenges that the career offers	76.0
Work that is out of an office	75.1
Time for interests outside of work	73.8
Work in a blend of professional disciplines	68.7
Opportunity to move between workplaces	59.2
Gain respect from others	57.6
Work as part of a team	56.4
Contribute to society in a practical way	54.9
Combine work and family	42.6

Note: number of responses varied between 324 and 329 participants.

### 3.4.2 Characteristics of a desirable career

Participants were asked to indicate how important various factors were in choosing a career (Table 10). The three most important reasons for choosing a career were:

- earnings potential (88%)
- being able to use strengths (85%)
- job security (83%).

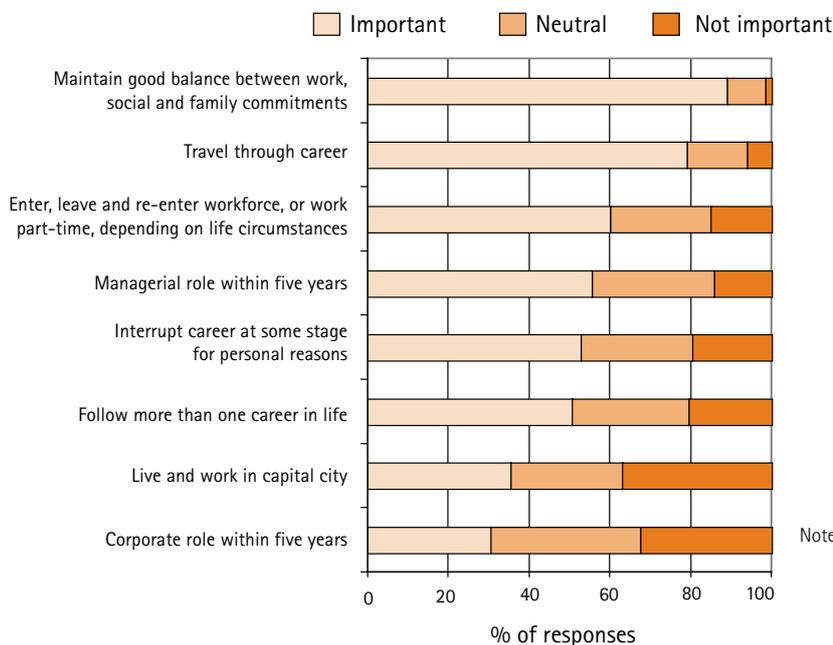
The opportunity for travel was also seen as an important feature (78%).

### 3.4.3 Career aspirations and expectations

In addition to aspiring to well-paid, secure and interesting careers, the majority of students also expressed a desire for a balance between their working and private lives (Figure 2). Most indicated that they wanted to:

- maintain a good work-life balance (89%)
- be able to travel through their careers (79%).

Figure 2: Career aspirations and expectations



Note: number of responses varied between 328 and 329 participants.

Career advancement was another important consideration for many students.

- 79% thought the opportunity for rapid career advancement was important when choosing a career (Table 10).
- More than half (56%) indicated that they expected to be in a managerial role within five years (Figure 2).

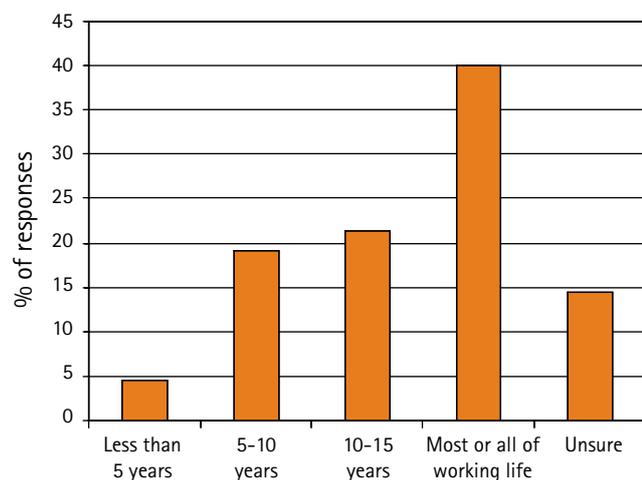
The majority of students also expressed a desire for job and career flexibility (Figure 2).

- 60% wanted to be able to enter, leave and re-enter the workforce or work part time, depending on life circumstances.
- 53% expected to interrupt their career at some stage for personal reasons (e.g. to have a family, provide support to a partner).
- 51% expected to follow more than one career in their working lives.

### 3.4.4 Intended length of stay in the minerals industry

Students were asked to indicate how long they were planning to stay working in the minerals industry (Figure 3).

Figure 3: Intended length of stay in the minerals industry



N = 322.

As illustrated in Figure 3:

- Two fifths (40%) of students envisaged staying in the industry for most or all of their working lives.
- Nearly one quarter (24%) intended to work in the industry for less than 10 years.
- Around 15% of students were unsure about their intended length of stay.

## 3.5 Shorter stayers v. longer stayers

Based on student responses to the question on intended length of stay in the minerals industry, the sample was divided into two groups - shorter stayers and longer stayers - to test for differences.

Shorter stayers were defined as those who had indicated that they would be staying either '5-10 years' or 'less than 5 years' in the minerals industry. Longer stayers were those had indicated that they would stay in the industry for '10-15 years' or 'most or all my working life' (Table 11).

Table 11: Student intentions to stay in the minerals industry

Length of stay	Percentage
Less than 5 years	4.7
5-10 years	19.3
<b>Total 'shorter stayers'</b>	<b>24.0</b>
10-15 years	21.4
Most or all of working life	40.1
<b>Total 'longer stayers'</b>	<b>61.5</b>
Unsure	14.6

N = 322.

As illustrated in Table 11, close to one quarter of the sample (24%) were shorter stayers, 62% were longer stayers and a further 15% were unsure<sup>5</sup>.

<sup>5</sup> Preliminary analyses showed that the 'unsure' category could not be grouped with either shorter or longer stayers and was therefore excluded from further analysis.

## Career plans

- The vast majority of the students (94%) were planning on a career in the minerals industry following graduation.
- The three most important reasons for choosing a career in the industry were:
  - earnings potential (88%)
  - being able to use strengths (85%)
  - job security (83%).
- Career expectations included:
  - work-life balance (89%)
  - rapid career advancement (79%)
  - travel opportunities (78%)
  - job and career flexibility (51-60%).
- Less than half the students (40%) intended to work in the minerals industry for all, or most of, their working lives.

### 3.5.1 General profile

Further analyses were conducted to determine whether there were any statistically significant differences between shorter stayers and longer stayers. Generally speaking, shorter stayers and longer stayers had a similar demographic and study profile. For example, there were no significant differences between the two groups in terms of age, relationship status, year of study or degree of exposure to the minerals industry.

However, longer stayers were significantly more likely to be scholarship or cadetship holders<sup>6</sup>. Scholarship or cadetship holders made up 43% of the longer stayer group, compared to only 30% of shorter stayers. While an association between length of stay and financial support can be demonstrated, the causal relationship between these findings is uncertain. Obtaining a scholarship or cadetship may serve to strengthen a student's commitment to the minerals industry for the longer term. On the other hand, scholarships may be awarded to those who are intrinsically more interested in the industry and are already intending to work in the industry for the long term.

### 3.5.2 Perceptions of the Industry

Longer stayers and shorter stayers had considerably different perceptions of the minerals industry. In general, longer stayers regarded the industry more positively than shorter stayers (Table 12; Appendix 2). Longer stayers were significantly more likely to agree that the industry was:

- safety-conscious
- exciting
- technologically advanced
- environmentally responsible
- socially responsible
- committed to equal opportunity.

On the other hand, shorter stayers were significantly more likely to agree that:

- working in the industry is difficult for those who have a family
- the lack of social life is unattractive
- working in remote locations is unattractive
- working in the industry is dirty
- working in the industry is tough for women
- the masculine culture of the industry is unattractive
- sexual harassment is a problem
- there is no job security.

Therefore, it seems that shorter stayers share some of the same negative perceptions of the minerals industry as the broader community and have not been persuaded by the current industry

6 Using Chi-squared tests,  $2(1, N = 275) = 4.26, p = .039$ .

campaigns to improve its image – perhaps because they are unaware of them, or perhaps because they are more sceptical about the industry.

**Table 12: Shorter and longer stayers' perceptions of the minerals industry**

Perceptions of the minerals industry	Shorter Stayers Agree (%)	Longer Stayers Agree (%)
<b>Attractive/positive attributes</b>		
Safety-conscious	80.3	88.9
Exciting	73.7	87.9
Technologically advanced	75.0	81.8
Environmentally responsible	48.7	70.2
Socially responsible	53.9	64.6
Committed to equal opportunity	47.4	51.3
<b>Unattractive/negative attributes</b>		
Difficult if have family	55.3	44.9
Lack of social life	49.3	32.5
Remote locations	48.0	26.4
Dirty	42.1	29.3
Tough for women	36.8	31.8
Masculine culture	22.7	13.8
Sexual harassment is a problem	17.1	13.6
No job security	15.8	8.1

Note: number of responses varied between 270 and 274 participants.

### 3.5.3 Motivations and expectations

Shorter stayers tended to be both more ambitious and more interested in career flexibility than longer stayers (Table 13; Appendix 2).

Shorter stayers were significantly more likely to want to:

- live and work in a capital city
- be in a corporate role within five years
- follow more than one career in their lives
- be able to enter, leave and re-enter the workforce, or work part time depending on life circumstances.

**Table 13: Shorter and longer stayers' career aspirations and expectations**

Career aspiration	Shorter stayers Agree (%)	Longer stayers Agree (%)
Live and work in capital city	54.5%	28.3%
Corporate role within five years	50.6%	24.2%
Follow more than one career	68.8%	42.9%
Be able to enter, leave and re-enter workforce or work part-time depending on life circumstances	68.8%	55.1%

N = 275.

#### Shorter stayers v. longer stayers

Shorter stayers had a less positive view of the industry than longer stayers. They were also more likely than longer stayers to want to:

- live and work in a capital city
- be in a corporate role within five years
- follow more than one career in their lives
- be able to enter, leave and re-enter the workforce, or work part time depending on life circumstances.

### 3.6 Suggestions for attracting more students

Participants were asked to suggest ways of attracting more students to the minerals industry. The most frequent responses related to greater exposure to the industry at secondary school. Comments included:

*"More knowledge of industry, exposure in year 12"*

*"More programs to show what jobs entail – more info at schools."*

One male responded:

*"When I was in high school I had no idea what a minerals process engineer actually did and I knew very very little about the industry then. There were no subjects, no seminars, nothing."*

Similarly, a female student reported:

*"I went to all girls school and never was told anything about a career in the minerals industry."*

The issue of the industry's poor image in the broader community was also referred to by several students:

*"Take away the stigma attached to mining such as being an all male, dirty job in a remote location."*

#### Suggestions for attracting more students

Respondents suggested the following as the most effective ways of attracting more students to the industry:

- providing secondary students with greater exposure to the industry
- improving the image of the industry.

# 4 implications for industry

The purpose of this study was to investigate student motivations, ambitions and perceptions in order to determine the strategies that would be most effective in attracting students to a career in the minerals industry and increasing their likelihood of staying. Most of the students who took part in the study seemed to have a clear idea of their future plans, with the majority intending to work in the minerals industry after graduation. They also had a generally positive view of the minerals industry, based on their experiences to date. However, there are a number of areas where steps can be taken to improve attraction and retention rates.

## 4.1 Attraction

### 4.1.1 Financial support and vacation employment

The majority of students rated financial support in the form of scholarships and cadetships and opportunities for vacation employment as major influences on their decision to study mining-related degrees. Students in receipt of scholarships and cadetships were more likely than others to indicate that financial support was an important factor in shaping their decision. While the causal relationship is uncertain, the finding does seem to suggest that financial assistance is an important consideration for some students. Consequently, the industry's current substantial investment in scholarships and cadetships (e.g. the Queensland Resources Council's careers website boasts "over 300 scholarships" available (QRC, 2007)) would appear to be a worthwhile strategy to attract more students to study minerals-related degrees.

Although financial support is important to some students, opportunities for vacation employment appear to be an even more important consideration in course selection. Opportunities for vacation employment, especially when offered to students at the end of their first year, may be an effective strategy for engaging those who remain undecided about their future career path.

A more ambitious program of change in the area of vacation employment could involve the development of stronger and more formalised links between industry and the tertiary sector through student 'internships' and industry placements. These co-operative programs, already operating in some overseas universities, incorporate a formal, assessed vacation work component as part of mining engineering degrees (Barclay and Pattenden, 2007).

Internships could assist students to develop a more grounded understanding of the minerals industry and the modern mining

workplace through active engagement with the industry. This could enable students to formulate career plans and aspirations at an early stage, based on more accurate knowledge and experience. Implementation of such programs, however, would require extensive research and evaluation, strong industry support, and the development of closer working relationships between companies and institutions.

### 4.1.2 Family and friends

Approximately thirty percent of the students surveyed considered encouragement from family or friends who work in the industry to be an important factor in their course selection. This suggests that the industry could make greater use of existing employees in order to encourage more students to consider a career in the minerals industry. Networking or mentoring opportunities, perhaps provided through professional bodies such as the Australasian Institute of Mining and Metallurgy (AusIMM), may be one way of implementing this strategy.

### 4.1.3 Career guidance

As supported by the WISER study (Lord et al., 2007), the current survey found that most students did not consider career guidance at school and university as an important influence on career choices. It is unclear, however, whether this low reliance on career guidance was due to lack of availability, or to students relying mainly on other influences when making career choices.

There is some evidence (Rowland Communications, 2004) to suggest that careers counsellors have a somewhat negative opinion of the minerals industry. Active engagement with career counsellors, with particular focus at the secondary level, can ensure that they are appropriately briefed on the opportunities available in the minerals sector, and help them form a more positive image of the industry. This may help to improve the image of the industry and highlight to students the opportunities available for those who have the skills to progress further.

Another initiative currently being supported by the minerals industry is the Australian government's Careers Advice Australia (CAA) Network. The aim of the Network is to provide a national career development and transition support system for all young Australians aged 13 to 19 years. The MCA is working closely with the CAA Network on this initiative, which represents an alternate means of reaching secondary students who may be interested in a career in the minerals industry. This is likely to be an effective

strategy both for attracting a more diverse group of students to the industry and for improving the image of the industry.

The majority of suggestions made by respondents on how to attract more students to the industry related to increasing student awareness about the industry at the secondary level. The industry is currently promoting the uptake of science and maths subjects in secondary schools, with the expressed aim of attracting more students to minerals-related courses (e.g. the MCA's National Schools Education Program, and the QRC's Education Program). However, further research is required to determine the effectiveness of these interventions.

#### 4.1.4 Industry image and reputation

Students participating in this study had a generally positive view of the minerals industry. Most perceived it as exciting, technologically advanced and safe. A smaller majority also saw the industry as socially and environmentally responsible. Students also disagreed that a negative media image was an unattractive feature of a career in the minerals industry.

While these findings may be partially due to the selection bias (i.e. students who view the minerals industry as positive are more likely to take up minerals-related degrees), it may also indicate that students are responding to current industry campaigns, which promote a more positive image of the industry. For example, *miningcareers.com*, the mining careers website funded by the MCA, is a site that provides information on how to get started on a career in the minerals industry. The site presents the industry as exciting and innovative (e.g. "Fly to work by chopper", "Discover something new every day" (MCA, 2006)).

These campaigns may be effective in reaching students considering a career in the minerals industry, especially those identified as shorter stayers. By raising awareness of the positive aspects of the industry that extend beyond the financial rewards, there is the potential to attract the interest of a broader range of students. For example, by emphasising the variety of the work, the technical challenges, opportunities for travel and the outdoor lifestyle, they may make the industry more appealing to other students who enjoy a challenge and want a role that is not desk bound, but had not previously considered the minerals industry.

#### 4.1.5 Equity issues

A substantial number of students were unsure about the industry's commitment to the promotion of gender equity, and a substantial

proportion agreed that the industry was a tough place for women to work. While there has been a rapid increase in student numbers since the current minerals boom (DEST, 2007; DETYA, 2001; MTEC, 2006), the proportion of female students in engineering and related fields has remained around 15% since 2000 (DEST, 2007; DETYA, 2001). The demographic profile of the students in this study is also around 15% and supports the view that women remain significantly under-represented in both the mining industry and in mining-related courses at university.<sup>7</sup>

Industry initiatives such as QRC's Resourceful Women program, MCA's Women and Mining Steering Committee and the Women in Mining Network (WIMNet) have worked actively over the last decade to attract women to the industry; however, female participation rates in the workforce remain fairly static, at around 13% (ABS, 2006). This is despite high-level commitments at an industry and corporate level to increasing female representation in the workplace (Kemp and Pattenden, 2007).

A key finding of this study is that many students, male and female, perceived the industry as not being family or relationship friendly. Having a successful career in the industry was seen as being dependent on a willingness to work in remote locations and for long hours. Taking into account the findings of previous studies, (Lord et al, 2007; Kemp and Pattenden, 2007; CBSR, 2005; Pattenden, 1998), it seems likely that these factors may be deterring many potentially eligible female students from considering a career in the industry.

## 4.2 Retention

Most of the students who completed this survey intended to pursue a career in the minerals industry on completion of their studies. However, while the majority of students (62%) intended to stay in the industry longer than ten years ('longer stayers'), a substantial proportion (24%) intends to leave before this time ('shorter stayers'). As skills shortages threaten to limit the potential for future expansion in the minerals industry, it is no longer enough to rely on longer stayers to meet organisational needs. The industry needs to reach out to students beyond the traditional pool to meet its staffing requirements, and perhaps tailor their attraction and retention strategies to meet the differing expectations of shorter and longer stayers.

---

<sup>7</sup> For a more detailed discussion of equity issues, see the CSRM report on female mining engineering and minerals processing students (Barclay and Pattenden, 2007), which is also based on the data used in this study.

### 4.2.1 Work life balance

The majority of students identified difficulties in balancing relationships and career and balancing parenting and career as the most unattractive features of the industry. There was also a strong desire to maintain a good balance between work and personal commitments and being able to travel throughout their careers. However, while students aspired to careers that maintained a balance between work and personal commitments, the vast majority identified willingness to work in remote locations and preparedness to work long hours as important qualities for a successful career in the minerals industry. Therefore, a conflict exists between students' desire for work life balance and the perception that jobs in the industry involve long hours and work in remote sites.

This is particularly evident in the comparison between shorter and longer stayers, with shorter stayers being significantly more likely to agree that working in the industry is difficult for those who have a family and that the lack of social life is unattractive. Shorter stayers were also significantly more likely to want to have career flexibility, such as entering and leaving the workforce and working part time to suit their life circumstances. Increased flexibility, in the form of even time rosters and reduced working hours, are therefore likely to appeal to all students, but especially the shorter stayers.

These findings reinforce the conclusions of previous studies (e.g. Barclay and Pattenden, 2007; Kemp and Pattenden, 2007; Pattenden, 1998; Rowland Communications, 2004; Lord et al., 2007), which concluded that a more flexible workplace is required if the industry is to attract and retain more employees. Even before they enter the workforce, students seem to hold a view that the industry is not family-friendly and that it is difficult to maintain work-life balance. Therefore, unless industry addresses the culture of long working hours and inflexible work practices, and ensures that site-level practices reflect a commitment to a more flexible workforce, it is likely to be difficult to attract and retain greater numbers of students in the industry.

### 4.2.2 Career advancement and change

Alongside the desire for work-life balance, students also identified the opportunity for rapid career advancement as an important factor when choosing between career options. Approximately half of those surveyed expected to be in a managerial role within five years and the majority agreed that there are currently many job opportunities in the minerals industry. Therefore, it is important to encourage graduates' sense of autonomy and responsibility even if promotion opportunities are not immediately available.

While these students' career expectations may appear overly ambitious, it is likely that they are aware of the current skills shortage and their increased bargaining power as a result. However, survey responses suggest that students have a limited awareness of the cyclical nature of the minerals industry (more than two thirds of respondents disagreed that there is no job security in the industry). Careful management will be needed to develop realistic career expectations in students, without disillusioning them once they enter the workforce or when economic conditions change.

Previous studies (CBSR, 2005; Kemp and Pattenden, 2007) have indicated that perceived lack of career development opportunities is one of the most common reasons for people to leave their current employment in the minerals industry. The findings from the current survey suggest that mining engineering and minerals processing students are ambitious and have high career expectations. It appears that these expectations are unlikely to be met, given the difficulties the industry is currently experiencing in retaining skilled employees.

The study found that shorter stayers tended to leave the industry to pursue other interests. An important issue for employers is to provide sufficient career incentives to keep employees engaged. For example, intra-company movement (i.e. transferring employees to different positions or divisions within the company) can provide the necessary change to keep employees interested in their jobs and prevent them from leaving to join competitors. Similarly, opportunities for travel, such as working in an overseas division of the company or attendance at international conferences may also retain their interest.

# 5 Conclusion

This report found that most students studying for mining engineering or minerals processing degrees at MTEC universities had a positive view of the minerals industry. Students generally seemed clear about their career expectations and were ambitious about their futures. Nonetheless, there were concerns about the nature of the industry, including working long hours and in remote locations, and maintaining the balance between work and their personal lives.

While the majority of students intended to pursue a career in the minerals industry, there is a substantial proportion of shorter stayers who plan to leave in less than ten years. Shorter stayers were particularly ambitious and held high expectations about their careers. They were also less positive about the industry and more concerned about work-life balance and flexibility. Since shorter stayers made up about a quarter of the total sample, it is important to understand their motivations because they are more likely to leave the industry if they are unhappy with their work situation.

In light of the current skills shortage, there is a need to extend current recruitment and retention strategies in order to maximise the available workforce.

## 5.1 Attraction strategies

The following strategies are suggested to attract more students to the minerals industry.

- Offering more opportunities for vacation employment. This includes the implementation of formal, assessed work as part of the degree.
- The provision of more networking or mentoring opportunities. In particular, taking advantage of existing links between employees and students.
- Conducting a review of career guidance materials and actively engaging with career counsellors, to better inform them about the industry. More research may be required to determine the effectiveness of interactions with career counsellors.
- Actively promoting and supporting strategies such as the CAA Network. Online careers advisory services are an alternative to traditional secondary school careers guidance programs that may be effective in reaching students making the transition from school to university.
- The continuation of marketing and promotional campaigns that focus on the variety of the work, travel opportunities, job security and career opportunities available.

- Addressing equity issues, both in the culture of the industry and in practices on the ground.

## 5.2 Retention strategies

The following strategies may assist with retention of graduates in the minerals industry.

- The introduction of more flexible working hours and improved rosters to allow employees to have a balance between work and their personal lives.
- The instigation of formal career development programs at the corporate level to enable planned career progression.
- Managing students' expectations so they do not become disillusioned with the industry, particularly in relation to the likely duration of the industry's current growth cycle,
- Facilitating intra-company movement to keep employees engaged.
- Providing opportunities for travel.

## 5.3 Industry challenges

The biggest challenge for industry in this time of skills shortage is to extend policies and practices to include people who do not 'fit' the traditional industry profile are attracted to careers in the industry. This will broaden the talent pool and help retain a larger proportion of employees. This study has identified two groups of particular interest.

### 5.3.1 Attracting and retaining women

If the minerals industry is to broaden the availability of skilled professionals, it needs to find ways of making itself more attractive to women. This includes not only promoting the image of equal opportunity through marketing campaigns, but also making a concerted effort to change practices on the ground to make the industry more attractive to women. The most important way of attracting and retaining women is to introduce more flexible work practices. This change is critical if the industry is to increase significantly the proportion of women it employs.

### 5.3.2 Retaining shorter stayers

Finally, the aspirations of shorter stayers will need to be addressed, if the industry is to maintain its skills base. This group represents a substantial proportion of the students surveyed and are those who will most likely exit the industry if their aspirations are not being met. Facilitating intra-company movement and opportunities for travel may stimulate employees' interests and help retain valuable staff.

## 6 References

- ABS (2001). *4102.0 Australian Social Trends*. Canberra, Australian Bureau of Statistics.
- ABS (2006). *Labour Force, Australia, Detailed Quarterly Statistics (6291.055.003)*. Canberra, Australian Bureau of Statistics.
- Barclay, M. and C. Pattenden (2007). *Female Mining Engineering and Minerals Processing Students: Career Drivers, Expectations and Perceptions*. Brisbane, Centre for Social Responsibility in Mining
- CBSR (2005). *Study into the Retention of Women in Minerals and Energy Resources Sector*. Canberra, Colmar Brunton Social Research.
- CSRM and UQSRC (2006). *2005 AusIMM/Macquarie Securities survey of Mining Industry Professionals: Key Findings*. Brisbane, Centre for Social Responsibility in Mining and the University of Queensland Social Research Centre.
- DEST (2007). *Students 2005: Selected Higher Education Statistics*. Canberra, Department of Education, Science and Training.
- DETYA (2001). *Students 2000: Selected Higher Education Statistics*. Canberra, Department of Education, Training and Youth Affairs.
- Kemp, D and C Pattenden (2007). *Retention of Women in the Minerals Industry*. Brisbane, Centre for Social Responsibility in Mining.
- Lord, L, A Preston, et al. (2007). *Young Women, Career Expectations & the Minerals Industry*. Canberra, A report prepared by WiSER for the Minerals Council of Australia and the Office for Women.
- Lowry, D, S Molloy, and Y Tan (2006). *The Labour Force Outlook in the Minerals Resources Sector: 2005 to 2015*. Report prepared for the Minerals Industry National Skills Shortage Strategy, National Institute of Labour Studies, Flinders University, Adelaide.
- MCA (2006). "Mining Careers." Retrieved 2/2/07, from <http://www.miningcareers.com/>
- MTEC. (2006). "University Enrolment Statistics."  
Retrieved 12/1/07, from [http://www.minerals.org.au/mtec/what\\_we\\_do/mtec\\_research/statistics](http://www.minerals.org.au/mtec/what_we_do/mtec_research/statistics).
- Pattenden, C (1998). *Women in Mining: A Report to the "Women in Mining" Taskforce of the AusIMM*. Melbourne, AusIMM.
- Rowland Communications (2004). *Attraction and Retention in Queensland's Mineral Resources Sector*. Brisbane, Rowland Communications
- QRC. (2007). "Scholarships." Retrieved 13/2/07, from [http://www.qrccareers.org.au/index.php?tgtPage=scholarship&id=list\\_all](http://www.qrccareers.org.au/index.php?tgtPage=scholarship&id=list_all).

## 7 Appendix 1: Questionnaire

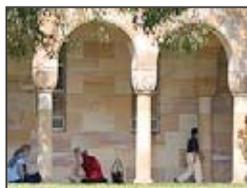
# Survey of tertiary sector student choices about mining careers

Centre for Social Responsibility in Mining  
University of Queensland, Australia

September 2006

[csrm@uq.edu.au](mailto:csrm@uq.edu.au)  
[www.csrm.uq.edu.au](http://www.csrm.uq.edu.au)

## ABOUT THE PROJECT



### What is this study about?

The purpose of this study is to better understand what factors influence students to pursue a career in the mining industry. The aim is to support industry initiatives to attract and retain staff in vocational and professional roles in the mining industry.

### Who is funding the study?

The study is being conducted by the Centre for Social Responsibility in Mining (CSRSM). It is jointly funded by the Minerals Council of Australia, and The Australian Government through the Office for Women (OfW).

### How long will this take?

Filling out the survey will take about 10-15 minutes.

### What do you do with this information?

The survey responses will be coded and combined with all other survey data in the study.

### Confidential and anonymous

Your survey responses are anonymous. Please *do not* put your name on the survey. Your answers to the questions, and any comments you make cannot not be linked to you in the research outcomes.

### How is confidentiality maintained?

All data is “de-identified”. That means your responses are coded without reference to personal identifying information and all surveys are kept securely at the University of Queensland.

### What will happen with the findings?

The outcomes of the research will contribute to better job design and career paths for men and women in the industry. Findings from the research will be used to provide advice to the

minerals industry on what attracts students to mining roles, what encourages, what encourages them to continue with their careers in mining, and what discourages them from pursuing careers in the industry.

### Do I have to participate?

Your participation is voluntary, you don't have to answer all the questions, and you can stop at any time. There are no risks to you personally for being involved in the research, or for withdrawing from the research.

### Can I find out what the results of the study?

Yes. Towards the end of the research a brief overview of the results will be made available to participants and their course coordinators. Please let us know if you wish to receive this feedback personally by contacting Mary Anne Barclay at the address below

### Ethical concerns?

This study adheres to the Guidelines of the ethical review process of the University of Queensland. If you would like to discuss your participation in this survey with one of the researchers, you are welcome to contact Mary Anne Barclay on (07) 3346 4047. If you would like to speak to an officer of the University *not* involved in the study, you can contact the Ethics Officer on (07) 3365 3924.

### Returning the survey

Please hand in the survey form to your lecturer at the end of this class.

For more information the project, please contact:

**Mary Anne Barclay**  
CSRSM, University of Queensland  
St Lucia Qld 4072  
07 3346 4047  
[m.barclay@smi.uq.edu.au](mailto:m.barclay@smi.uq.edu.au)  
[www.csrsm.uq.edu.au](http://www.csrsm.uq.edu.au)

OR

**Joni Parmenter**  
Research Officer  
CSRSM, University of Queensland  
Phone: 07 3346 4005  
Email: [j.parmenter@smi.uq.edu.au](mailto:j.parmenter@smi.uq.edu.au)  
Web: [www.csrsm.uq.edu.au](http://www.csrsm.uq.edu.au)

**Please complete all questions.**

**Even if you feel unsure, have a go!**

**Do NOT put your name on the survey.**

**Please read the information sheet above before answering these questions**

**PART 1: GENERAL INFORMATION**

<b>Q 1</b> Have you read the information sheet about this survey and do you consent to participate ( <i>please tick</i> )	<input type="checkbox"/> Yes
<b>Q 2</b> You are	<input type="checkbox"/> Male <input type="checkbox"/> Female
<b>Q 3</b> Your age is...	<input type="checkbox"/> 18 <input type="checkbox"/> 19 <input type="checkbox"/> 20 <input type="checkbox"/> 21 <input type="checkbox"/> 22 <input type="checkbox"/> 23 <input type="checkbox"/> 24 <input type="checkbox"/> 25+
<b>Q 4</b> Do you identify as an Aboriginal person or Torres Strait Islander?	<input type="checkbox"/> Yes <input type="checkbox"/> No
<b>Q.5</b> Are you currently ...	<input type="checkbox"/> Single <input type="checkbox"/> Partnered / in a relationship
<b>Q 6</b> Do you have any dependent children?	<input type="checkbox"/> Yes <input type="checkbox"/> No
<b>Q 7</b> Do you have family or friends who work in the minerals industry?	<input type="checkbox"/> Yes <input type="checkbox"/> No

## PART 2: PROGRAM INFORMATION

<p><b>Q 8</b> Which of these best describes your current program of study?</p>	<input type="checkbox"/> Mining Engineering <input type="checkbox"/> Minerals processing / Metallurgy <input type="checkbox"/> Other program <i>(please specify)</i> _____	
<p><b>Q 9</b> What year of the program are you currently studying?</p>	<input type="checkbox"/> 2 <sup>nd</sup> year <input type="checkbox"/> 3 <sup>rd</sup> year <input type="checkbox"/> 4 <sup>th</sup> year	<input type="checkbox"/> Other
<p><b>Q 10</b> Are you in receipt of a scholarship or cadetship?</p>	<input type="checkbox"/> No <input type="checkbox"/> Yes <i>(please specify)</i> _____	
<p><b>Q 11</b> Do you have any prior work experience in the minerals industry? <i>(you may tick more than one box)</i></p>	<input type="checkbox"/> Field trips/ site visits during my course <input type="checkbox"/> Vacation experience with a mining/ minerals processing company <input type="checkbox"/> I previously worked in the industry <input type="checkbox"/> No prior experience	
<p><b>Q 12</b> How likely are you to work in the minerals industry after you complete your current program of study?</p>	<input type="checkbox"/> Not likely <input type="checkbox"/> Not sure <input type="checkbox"/> Likely	
<p><b>Q 13</b> When you complete the program, do you intend to...</p>	<input type="checkbox"/> Work for a mining company <input type="checkbox"/> Return to your previous employer in the minerals industry <input type="checkbox"/> Join a consulting firm <input type="checkbox"/> Work for a contractor <input type="checkbox"/> Undertake further study <input type="checkbox"/> Work in another industry <input type="checkbox"/> Unsure <input type="checkbox"/> Other <i>(please specify)</i> _____	
<p><b>Q 14</b> If you plan to work in the minerals industry, how long do you intend to stay?</p>	<input type="checkbox"/> Less than 5 years <input type="checkbox"/> 5-10 years <input type="checkbox"/> 10-15 years <input type="checkbox"/> Most or all my working life <input type="checkbox"/> Not sure	

## PART 3: MOTIVATIONS

### Q 15 Why did you choose this course of STUDY?

Please show how important each of the following factors were in your decision by circling the number that best represents your view. 1 = Not at all Important to 5 = Very Important.

	<b>Not at all Important</b>				<b>Very Important</b>
a) To equip me for a career in the minerals industry	1	2	3	4	5
b) To learn about the minerals industry	1	2	3	4	5
c) Publicity about the resources boom	1	2	3	4	5
d) The opportunity to study subjects I'm good at	1	2	3	4	5
e) Encouragement from family or friends	1	2	3	4	5
f) Career guidance at school/university	1	2	3	4	5
g) Availability of financial support (.e.g. scholarship, cadetship)	1	2	3	4	5
h) Opportunities for vacation employment	1	2	3	4	5
i) Other ( <i>please specify</i> )	-----				

### Q 16 In choosing a CAREER, how important are the following factors to you?

Please show how important you think each of the following factors is by circling the number that best represents your view. 1 = Not at all Important to 5 = Very Important

	<b>Not at all Important</b>				<b>Very Important</b>
a) Being able to work in an area where I can use my strengths	1	2	3	4	5
b) Being able to work in an industry where there is a blend of professional disciplines	1	2	3	4	5
c) The challenges that the career offers	1	2	3	4	5
d) The earnings potential	1	2	3	4	5
e) Job security	1	2	3	4	5
f) The opportunity for rapid career advancement	1	2	3	4	5
g) Having time for interests outside of work	1	2	3	4	5
h) Travel opportunities	1	2	3	4	5
i) Working in a profession that gains respect from others	1	2	3	4	5
j) Doing something that contributes to society in a practical way	1	2	3	4	5

	<b>Not at all Important</b>				<b>Very Important</b>
k) Doing work that gets me out of an office	1	2	3	4	5
l) The opportunity to move between workplaces	1	2	3	4	5
m) The ability to combine work and family (e.g. by working part-time)	1	2	3	4	5
n) The ability to work as part of a team	1	2	3	4	5

**Q 17 What aspects of a career in the minerals industry do you consider UNATTRACTIVE?**

*Please indicate whether you agree or disagree with each of the statements by circling the number that best represents your view. 1 = Strongly Disagree to 5 =Strongly Agree.*

	<b>Strongly Disagree</b>				<b>Strongly Agree</b>
a) The course requirements are daunting	1	2	3	4	5
b) Having to work in remote locations	1	2	3	4	5
c) Unattractive work arrangements (e.g. 12 hour shifts, fly-in fly-out operations)	1	2	3	4	5
c) Lack of a social life	1	2	3	4	5
d) Difficulties in balancing relationships and career	1	2	3	4	5
e) Difficulties in balancing parenting and career	1	2	3	4	5
f) The masculine culture of the industry	1	2	3	4	5
g) Negative media image of the industry	1	2	3	4	5
h) Other ( <i>please specify</i> )	-----				

## PART 4: GENERAL VIEWS ABOUT THE MINERALS INDUSTRY

### Q 18 What are your GENERAL IMPRESSIONS of the minerals industry?

Please show your level of agreement or disagreement with the following statements by circling the number that best represents your view. 1= Strongly Disagree to 5= Strongly Agree.

	<b>Strongly Disagree</b>				<b>Strongly Agree</b>
a) The minerals industry values entrepreneurship	1	2	3	4	5
b) The minerals industry is conservative	1	2	3	4	5
c) The minerals industry is committed to 'equal opportunity'	1	2	3	4	5
d) The minerals industry is technologically advanced	1	2	3	4	5
e) The minerals industry is an exciting industry to be working in	1	2	3	4	5
f) The minerals industry is safety conscious	1	2	3	4	5
g) The minerals industry is environmentally responsible	1	2	3	4	5
h) The minerals industry is socially responsible	1	2	3	4	5
i) Working in the industry is dirty	1	2	3	4	5
j) There is no job security in the minerals industry	1	2	3	4	5
k) Working in the industry is tough for women	1	2	3	4	5
l) Sexual harassment is a problem in this industry	1	2	3	4	5
m) There are lots of job opportunities in the minerals industry at present	1	2	3	4	5
n) The minerals industry is a difficult place to work if you have a family	1	2	3	4	5

### Q 19 How important do you think the following PERSONAL QUALITIES are to a successful career in the minerals industry?

Please show how important you think each of the following qualities is by circling the number that best represents your view. 1 = Not at all Important to 5 = Very Important

	<b>Not at all Important</b>				<b>Very Important</b>
a) Having a strong desire to prove yourself	1	2	3	4	5
b) Being a team player	1	2	3	4	5
c) Liking a challenge	1	2	3	4	5

	<b>Not at all Important</b>				<b>Very Important</b>
d) Being emotionally strong	1	2	3	4	5
e) Being confident and self-sufficient	1	2	3	4	5
f) Being willing to work in remote locations	1	2	3	4	5
g) Being prepared to work long hours	1	2	3	4	5
h) Being prepared to put your career first	1	2	3	4	5
i) Having a supportive partner/spouse	1	2	3	4	5

## PART 5: ASPIRATIONS AND EXPECTATIONS

### Q 20 What are your CAREER ASPIRATIONS and EXPECTATIONS?

*Please show how important the following aspirations are to you by circling the number that best represents your view. 1 = Not at all Important to 5 = Very Important.*

	<b>Not at all Important</b>				<b>Very Important</b>
a) I expect to be in a managerial role within 5 years	1	2	3	4	5
b) I want to be able to live and work in a capital city	1	2	3	4	5
c) I expect to be in a corporate role within 5 years	1	2	3	4	5
d) I expect to follow more than one career in my life	1	2	3	4	5
e) I expect to interrupt my career at some stage for personal reasons (e.g. to have a family, or provide support to a partner)	1	2	3	4	5
f) I want to be able to enter, leave and re-enter the workforce, or work part time, depending on my life circumstances	1	2	3	4	5
g) I want to be able to travel through my career	1	2	3	4	5
h) I want to maintain a good balance between work, social and family commitments	1	2	3	4	5

**Q 21 What do you think would attract more STUDENTS to take up mining-related subjects?**

---

---

---

---

---

---

---

---

**Q 22 Do you consider it more difficult for women than men to have a career in the minerals industry?**

- Yes
- No
- Not sure

**Q 23 If yes, please indicate why...**

---

---

---

---

---

---

---

---

**Q 24 What do you think would attract more WOMEN to a career in the minerals industry?**

---

---

---

---

---

---

---

---

## THANK YOU FOR COMPLETING THIS SURVEY.

- ***Please pull off this page and keep it with you.***
- ***Please hand the survey to your lecturer at the end of the class.***

Your answers to the questionnaire will be coded and combined with all other survey information to build an overall picture of perceptions of students in mining-industry related courses. Your answers to the survey are anonymous and cannot be linked to you.

A brief report of the results will be prepared and distributed to participants in a newsletter format. Please let us know if you wish to receive this feedback by contacting Mary Anne Barclay.

### **Mary Anne Barclay**

Centre for Social Responsibility in Mining  
University of Queensland  
Phone: 07 3346 4047  
Email: [m.barclay@smi.uq.edu.au](mailto:m.barclay@smi.uq.edu.au)  
Web: [www.csrsm.uq.edu.au](http://www.csrsm.uq.edu.au)

This study adheres to the Guidelines of the ethical review process of The University of Queensland. You are welcome to discuss your participation in this study with the researcher s (contact Mary Anne Barclay on 07 3346 4071). If you would like to speak to an officer of the University not involved in the study, you can contact the Ethics Officer on (07) 3365 4042.

## 8 Appendix 2: Analyses of Shorter v. Longer Stayers

The following table presents the significant results of the independent-groups ANOVAs conducted between shorter stayers and longer stayers.

	Shorter Stayers		Longer Stayers		df	F	p
	M	SD	M	SD			
<b>Perceptions of industry</b>							
Industry is safety conscious *	4.21	0.82	4.43	0.76	1,272	4.38	.037
Industry is exciting **	3.93	0.93	4.36	0.78	1,272	14.60	.000
Industry is technologically advanced *	3.92	0.81	4.18	0.80	1,272	5.74	.017
Industry is environmentally responsible *	3.54	0.94	3.85	0.94	1,272	5.94	.015
Industry is socially responsible *	3.54	0.92	3.77	0.85	1,272	3.99	.047
Industry is committed to equal opportunity *	3.24	1.02	3.51	0.92	1,271	4.49	.035
Working in industry is difficult if have a family *	3.71	0.94	3.42	1.05	1,272	4.47	.035
Working in industry is dirty *	3.24	1.17	2.82	1.23	1,272	6.56	.011
Working in industry is tough for women *	3.17	1.10	2.83	1.16	1,272	4.81	.029
Sexual harassment is a problem *	2.71	1.02	2.37	1.08	1,272	5.50	.020
No job security *	2.47	0.97	2.14	0.95	1,271	6.78	.010
<b>Unattractive aspects of industry</b>							
Lack of social life *	3.36	1.29	2.97	1.16	1,270	5.81	.017
Working in remote locations **	3.35	1.21	2.72	1.19	1,270	15.08	.000
Masculine culture *	2.65	1.25	2.30	1.10	1,268	5.29	.022
<b>Career aspirations</b>							
Live and work in capital city **	3.62	1.10	2.78	1.30	1,273	25.24	.000
Corporate role within five years **	3.49	0.96	2.84	1.09	1,273	21.50	.000
Follow more than one career **	3.87	1.03	3.23	1.08	1,273	20.21	.000
Be able to enter, leave and re-enter workforce or work part-time depending on life circumstances *	3.83	1.06	3.53	1.13	1,273	4.05	.045

\* p < .05.

\*\* p < .001.

The views expressed in this publication do not necessarily represent those of the Minerals Council of Australia.

Reproduction of this publication for educational or other non-commercial purposes is authorised provided proper acknowledgement of the source of such materials. Reproduction of this publication, or segments of it, for resale or other commercial purposes is prohibited without prior written permission of the Minerals Council of Australia.

No person should rely on the contents of this publication without first obtaining advice from a qualified professional person. The Minerals Council of Australia and the authors, editors and any consultants accept no liability (including liability in negligence) and take no responsibility for any loss or damage which a user of this publication or any third party may suffer or incur as a result of reliance on this publication, and in particular for:

- (a) any errors or omissions in this publication;
- (b) any inaccuracy in the information and data on which this publication is based or which is contained in this publication;
- (c) any interpretations or opinions stated in, or which may be inferred from this publication.

Minerals Council of Australia

Walter Turnbull Building 44 Sydney Avenue FORREST Canberra ACT 2603

T: (+61) 2 6233 0600 F: (+61) 2 6233 0699 [www.minerals.org.au](http://www.minerals.org.au)

ACN 008 455 141 ABN 21 191 309 229 ISBN 978 1 920891 176