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# Community perceptions of potential renewed copper mining, Kapunda, S.A.

Town identity & views towards Copper In-Situ Recovery methods

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Cooperative Research Centre Project- Kapunda In-situ Copper and Gold Field Recovery Trial



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# Executive summary

This report presents the findings of social research to investigate how residents of Kapunda, South Australia view the mining sector in general and how it fits with town identity. It considers the extent to which a renewed mining industry would align to existing values, and explores the residents' concerns and perceived benefits relating to the potential use of In-situ Recovery (ISR) methods to extract copper from a historic deposit in the town.

The research presented in this report is based on qualitative analysis of focus groups conducted to understand how residents view the mining sector in general, its fit with town identity and the extent to which a renewed mining industry aligns to existing values. It presents the findings on residents' perceived benefits and concerns, relating specifically to ISR methods, as part of a wider portfolio of projects on the social, technical and environmental feasibility of ISR in Kapunda.

The research employed a social licence framework to consider the inter-relationships between different factors which contribute to trust in and acceptance of extractive industries. This framework was originally developed by CSIRO in relation to the mining industry and has since been refined and customised to multiple industries. The framework considers impacts and benefits, procedural fairness, distributional fairness and confidence in governance. The results are not intended to be representative in a statistical sense. Rather, the qualitative methods employed in this research enable a deep understanding of the different issues and dimensions that participants have in focus when considering a potential new development. The research provided a deliberative process for participants to reflect on and share their perspectives on perceived concerns and opportunities related to In-Situ Recovery and the mining industry in general.

The research demonstrated that ISR was seen to have potential for the town. Data highlighted several tangible and intangible benefits. Participants indicated that putting Kapunda 'on the map' as the first Australian ISR Copper mine was appealing and resonated strongly with the town's historical identity as the country's first ever copper mine. Other perceived benefits included contributing to the local economy with participants expressing that even modest increases to employment would be welcome. The study also raised perceived concerns, in particular around visual amenity and disruption to a historic site.

The degree to which a new ISR mining operation in Kapunda would be ultimately accepted depends on following a rigorous, evidence-based research and assessment process and maintaining transparent communication to show that any potential environmental impacts were understood and managed effectively.



# 1 Introduction

## 1.1 Location

Kapunda is a town of around 3,000 people (ABS 2016) located approximately 80 kilometres from State capital of Adelaide on the Thiele Highway, north of the Barossa Valley. Mining was central to the early development of the town during the 1840s where Australia's first commercially successful copper mine was established and operated for several decades and played an important role in the State economy. The town developed adjacent to this mine and to this day the town is situated adjacent the historic mine. This mining history continues to play an important part in the town's identity. The pastoral industry also has an important role in the history and identity of the town. Sir Sydney Kidman, a pastoralist with extensive holdings across Australia, established his home and office in the town which served as his base from the 1880s to 1921. The economy of the town has changed over time and in the current era the economic sectors with the highest employment in town are wine making, aged care residential services, secondary education, pubs and road freight transport (ABS 2016). The town also produces stock feed products for domestic and export markets, as well as road base, concrete and land scaping materials from a nearby quarry.



Figure 1 Location map showing Kapunda and Adelaide, South Australia

## 1.2 In-situ recovery

In-situ recovery (ISR) is a form of extracting target metal from minerals without mining the rock that contains them. ISR has sometimes been referred to as 'keyhole mining': rather than removing ore from the ground, a solution is pumped underground through boreholes to dissolve the target mineral in place (hence in-situ) then the solution is pumped back to the surface where the metal (e.g. copper) is recovered (Kuhar et al 2018; Robinson and Kuhar, 2018). Because it is not necessary to remove the ore, there is considerably less surface disturbance compared with open pit mining, which avoids the creation of large voids, reduces dust and noise, removes the need for tailings dams and requires minimal infrastructure. ISR involves pumping a solution underground, which raises other potential issues (Lacey et al 2019). The solution that is used should be able to dissolve the target mineral (based on its chemical properties), and the solution composition is expected to vary from natural background groundwater compositions. Therefore, solution flow control and containment is required to retain solution within the mining area and prevent leakage. ISR mining is used commercially in Australia but has not yet been used for copper (Kuhar et al 2018; Robinson and Kuhar, 2018).

## 1.3 Social licence

Research at both local and national levels has demonstrated that procedural fairness, distributional fairness as well as confidence in governance, are critical in determining the social acceptance of prospective projects by local communities (Falck, 2016; Zhang, Measham and Moffat 2018; Lacey et al, 2017; Moffat & Zhang, 2014; Moffat et al. 2018). In the context of resource development at the local level, procedural fairness is about whether community members feel that their voice is heard and respected in the decision-making process. Community members' trust in a mining company represents their confidence that the mining company will act responsibly on issues that matter to them. Confidence in governance refers to whether community members believe that the regulatory and legislative arrangements are capable of ensuring responsible mining development. In contrast, distributional fairness reflects the idea that impacts and benefits are shared equitably. Distributional fairness can occur at local scale e.g. considering potentially different outcomes for segments within a host community, or at regional scale – e.g. whether whole regions receive a curse or blessing from their resource base (Fleming et al 2015). In addition, the role of perceived benefits and impacts has been commonly recognised as affecting acceptance of resources projects (Walton et al 2017; Moffat et al 2017; Measham and Zhang, 2019) as represented in figure 1.

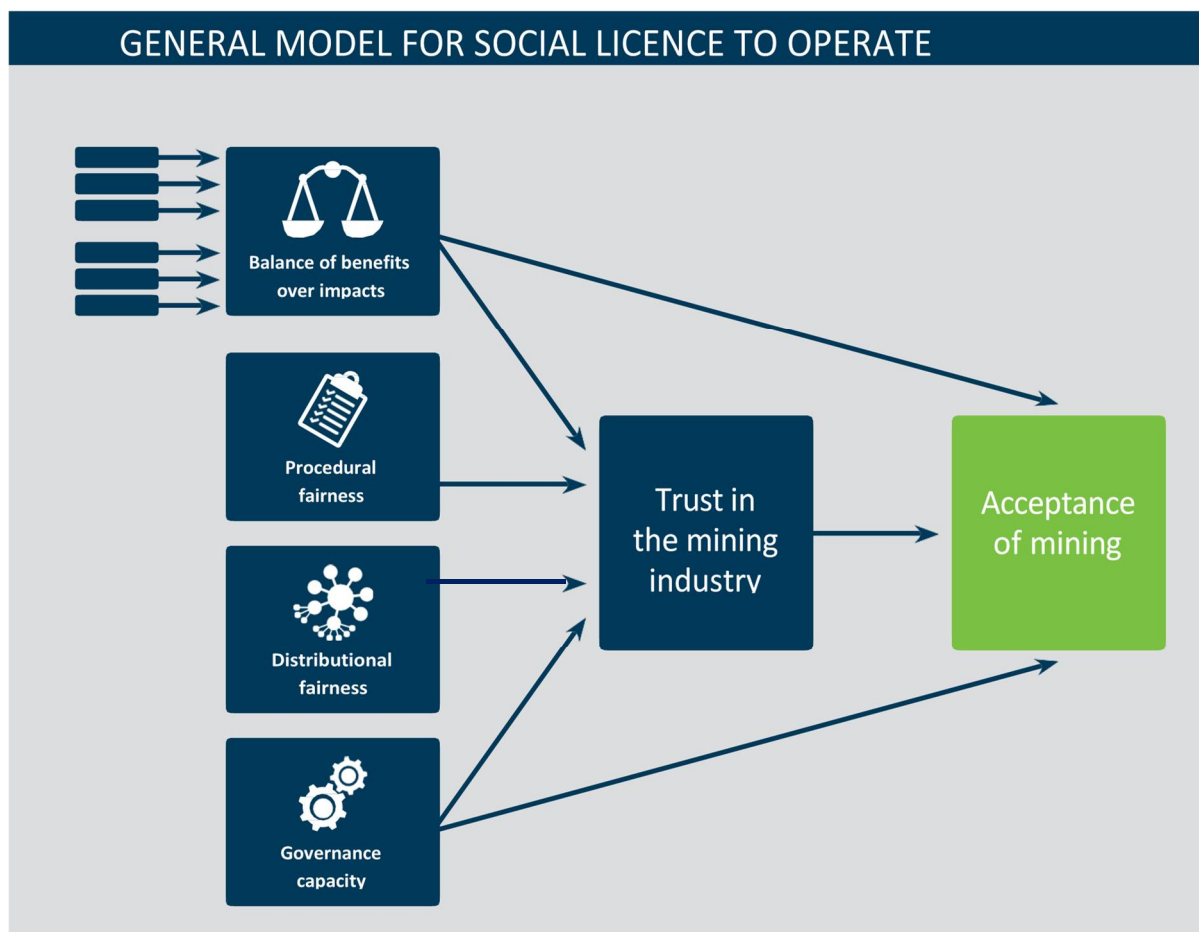


Figure 2 Model of social licence dimensions adapted from Moffat et al 2017

## 2 Aim of this research

The aim of this project was to understand how residents of Kapunda view the mining sector in general and how it fits with the identity of the town. Furthermore, the project aimed to clarify to what extent a renewed mining industry would align to existing values and identify any perceived concerns and benefits relating to in-situ recovery methods. More broadly the project sought to provide a deliberative process to reflect on and share perspectives among residents on perceived concerns and opportunities related to a potential ISR development on the site of the historic copper mine that was central to the establishment of the town. Understanding these issues and how they potentially related to general dimensions of social licence were seen to be important components of an integrated approach to considering the social, economic and environmental feasibility of copper ISR mining in Kapunda and in Australia more generally. The research was funded as part of a Cooperative Research Centre Project which also comprised research on groundwater flow, water and soil characteristics, chemistry of potential lixivants (dissolving agents) and the geological structure of the remaining copper deposit in the town, shown in Figure 3, including hydrogeological characteristics. These components have been designed to develop an integrated approach to researching the feasibility of extracting copper through in-situ recovery methods in Kapunda.



**Figure 3 Kapunda Historical Mine Site and site of potential renewed mining. Photo author: A.C Thiele of Kapunda.**

## 3 Methods

### 3.1 Qualitative design

The data were collected at two focus groups and four key participant interviews. There was a total of 18 participants reflecting a wide range of people across different segments, seeking to represent a breadth of perspectives in line with qualitative research designs, rather than a statistically representative sample (Beitin, 2012). In the two focus groups there were respectively, 8 and 5 participants. Across the four interviews there were five participants, which included two participants in one interview. Despite invitations to approximately equal numbers of males and females, the sample was skewed towards males with 15 men and 3 women participating. Participants ages ranged from approximately 40 to 85 years. The participants represented a range of positions within the community, including Local Government Councillors, leaders of local groups and other key roles in the community, such as local business and educators. The participants also represented a range of connections with the site where potential mining operation would occur. Several of the participants had a connection to the historic mine site, either through their interest in local history, where they lived. or through their recreational activities which involved frequent visits to the site and its historical walking trail.

In line with the aims of the research, the guiding questions for the focus groups and interviews centred on the understanding the character and identity of the town and views of the mining sector in general. The focus groups were conducted in Kapunda by the authors' project team with skills in qualitative research methods and experience in facilitation of focus groups. This was followed by a technical presentation given by a mine processing chemistry expert about ISR mining in general and described examples of other ISR mining projects in other countries. The presentation provided information about the technical components of ISR and how the Cooperative Research Centre-Project is investigating how these could be applied in Kapunda. The presentation explained the dissolving process and discussed a range of potential dissolving agents (lixiviants) which could be employed, depending on the environmental characteristics of the site. This presentation was seen by participants as very helpful in developing an idea of what an ISR operation in Kapunda could look like. Following the technical presentation, the focus groups and interviews proceeded to discuss concerns and perceived benefits from a potential ISR operation in Kapunda. The full set of guiding questions from the focus groups and interviews is presented in Appendix 1.

### 3.2 Analysis

The interviews and focus groups were transcribed and imported into qualitative analysis software (NVivo v12). Analysis involved systematically grouping the responses into themes and then aggregating these themes. Employing the Adaptive Theory approach (Layder, 1998), the research team started with an initial model in mind based on the general model of social licence presented in Table 1 and adjusted based on the reflections recorded by the research team immediately after

the focus groups and interviews. Once the transcripts were entered into the software, the research team compared the emerging themes with the initial model to arrive at the final set of themes presented in this report. The coding was conducted individually by two members of the research team and then cross-checked by other team members to confirm the robustness of the coding process.



## 4 Results

### 4.1 Town identity and community values

Participants described Kapunda as a friendly and relaxed place to live. They emphasised it has having the dual advantages of a quiet country feel and a strong sense of community. At the same time they highlighted that Kapunda was relatively accessible to the State capital of Adelaide which is considered an easy drive. Participants depicted Kapunda as a quiet, safe place where most people knew each other and took the time to ask how they were going when they passed in the street. Participants stated a high regard for the infrastructure and services in the town. These included good medical facilities, emergency services, excellent schools, and high quality recreational and sporting opportunities.

Participants described the town's strong historical connections to both mining and pastoralism. They emphasised the town identity is strongly linked to mining, with the town being established as the first commercially successful copper mine in the country and played an important role in the prosperity of the State during the 19<sup>th</sup> Century. Participants also emphasised how the identity of the town was also strongly tied to the Kidman pastoral company. Sir Sydney Kidman established his headquarters in the town, subsequently donating the building to the Education Department when he retired.

Participants explained that many residents maintain a connection to the historic mine site, either through involvement in the local history society, as a place of recreation for walks or for business, with fitness classes operating at the mine site and places providing accommodation to visitors taking part in heritage tourism.

However, it was also noted that not all residents were interested in the history of the town. For some people Kapunda represents a convenient location. Many people who live in the town do so because it is a comfortable and affordable place to live and an easy commute to work in places such as the Barossa Valley, Gawler, Elizabeth and Adelaide.

*"It has a lovely village feel about it...set in a very beautiful natural environment..."*

*"...people say g'day to you, you pretty much know everybody"*

*"...the mining is huge. It's what the town was based on. The mine site is very important"*

Participants conveyed that the town has been progressive in recent years, improving the streets and enhancing the visual amenity of the town through murals and signage that convey the history of the town and its links to both the mining and pastoral industries. Participants were upbeat about some of the developments in the town such as the opening of a brand-new supermarket and a new bakery. Over the years the school has grown and currently has around 500 students. The school has a special link to the history of the town as one of the buildings was formerly the home and office of Sir Sydney Kidman who donated the building to the school when he retired.

Some other aspects of the town were seen as limitations. Kapunda is lacking some services, especially retail options. A large proportion of shopping is conducted outside the town. Participants raised several examples of shops and cafes that had tried to establish themselves in the town but had closed not long after opening, due to having insufficient customers to pay the rent.

This related to another issue raised by participants: there are currently not many employment options in the town itself. This was particularly a concern for young people. Besides the stock-feed processing facility and a small number of shops there were not many places that local school leavers could find jobs.



Figure 4 View of Kapunda township. Photo author: A.C Thiele of Kapunda.



## 4.2 Procedural fairness

From the perspective of some participants, procedural fairness (i.e. having a voice, building relationships, being treated fairly) was high. In the focus groups and interviews participants described how the project proponents have made a commitment to making themselves available to the public through opening an office in the main street. The data from the focus groups and interviews also confirmed that the proponents have been highly engaged with Council and proactive about providing information and responding to queries. Some participants also mentioned that the proponents had built good relationships with those who could serve as potential suppliers or provide professional services to the project, if it goes ahead.

Other participants had never heard of the proponents and had no previous knowledge of the proposal for a new ISR mine prior to the focus groups. They came with an open mind and many questions about ISR methods and details of the project. For these participants there was an appetite for increased interaction, reflecting a need for expanding the range of people who have been engaged on the project. For these participants, procedural fairness was neither low nor high.

Other participants raised concerns about procedural fairness, in particular they thought they may have received a 'sanitised' version of the benefits and risks. Although they didn't articulate a tangible problem, the feeling of not quite receiving the full picture led to a sense of suspicion for those participants. It is important to emphasise that this is an issue of understanding and genuinely listening to people's concerns. Whether or not those concerns are based in fact is a separate issue. We also know from other research elsewhere that it may not be possible to satisfy everybody (e.g., Moffat et al 2017). The crucial part of procedural fairness is that people have a voice and that their concerns are genuinely considered.

*We've been involved a fair bit, and there's a few points that have gotten raised.*

*I think they need to... invite the general public...not just a select few... this is what we're doing, come and listen*

### 4.3 Distributional fairness

The focus groups and interviews highlighted that a new mining operation in the form of In-Situ Recovery would be generally beneficial to the town, with a wide range of benefits summarised in section 4.6. However, it was also acknowledged that renewed mining could affect some people differently from others. In particular, the downsides to a new operation could be unevenly spread across the town population. Social science refers to this as 'distributional fairness'.

The first aspect of distributional fairness is that some sectors of the economy may lose more than others. This was particularly a concern for the tourism sector, notably those operators servicing heritage tourism. If the heritage appeal of the site was diminished, or the site was closed for a prolonged period, then this could have a negative impact on those businesses. It was also noted that some businesses provide fitness classes at the mine site, and these would also be affected more than other businesses.

A second dimension to distributional fairness was the spatial concentration of impacts within a particular area. There was a concern that those people living close to that area could be more affected by potential issues such as noise, dust and visual impacts particularly during the construction phase which could involve truck movements, fence construction and other types of disruption. This issue was raised across both focus groups and interviews, including those who are not physically close to the site, but had concern for those people who were close.

The third way that distributional fairness arose during the research was through recreation. Participants identified communities of joggers and dog walkers use the site for recreation. These people would be proportionally more disrupted compared to others.

In considering the issue of distributional fairness, it is clear that timeframes are an important factor. Participants conveyed that a relatively short term disruption (e.g. up to a few months) would be an inconvenience that residents, businesses and recreationists should be able to tolerate. Conversely, a longer duration (e.g. years) would represent an unfair burden on those members of town who would bear the brunt of the impacts.

*I can see enormous benefits for the town... the only thing I could see as being a problem is those people who are affected by that particular area*

*let's say we close your mine site for five years... some people would say 'don't care' and others, the joggers, the fitness classes... dog walkers ...would be well put out...*

## 4.4 Confidence in governance

The focus groups clearly demonstrated that the vast majority felt the approval processes were rigorous and evidence-based. There was a strong sense that the project would only proceed following careful assessment at local and State levels drawing on rigorous research provided by University of Adelaide and CSIRO.

Confidence in governance could be strengthened further by providing more information about the steps in the decision making process, leading to increased trust. Some research participants had questions over decision making procedures, particularly around the sequence and timelines for steps in the decision-making process.

The issue of maintaining independence was also raised, particularly for monitoring. In order to maintain confidence in decision making, some participants emphasised that certain tasks should not be completed by the proponents in order to rule out any potential conflict of interest. Participants found the idea of an environmental 'scorecard' appealing, however they sought confirmation that reputable third parties were responsible for both preparing and updating the scorecard based on independent measurements. The ongoing monitoring of environmental effects is very important and ensuring independent monitoring from the outset is an important component of maintaining confidence in governance.

Another issue for maintaining confidence in governance is transparency about financial gains. For example, if residents suspected that one of the decision making bodies (such as Council or State Government) became focused on revenues coming from the project, then this would reduce confidence in governance. Thus, it is important to maintain transparency in decision making.

*Providing that all the safeguards are met, I'm certainly in favour of the project*

*I am convinced [by] the process that we are going through in terms of the research and the approval process... it won't go ahead unless it's safe.*

## 4.5 Trust

A range of factors emerged through the focus groups and interviews that contributed to trust in the industry. Some were factors that contribute to increasing trust and others to reducing trust. For some, trust was created through getting to know the proponents and seeing them as part of the town. This included establishing a physical presence in the main street, frequenting local businesses and regular interaction with Council.

The Cooperative Research Centre Project associated with the feasibility of ISR methods and their potential application in Kapunda was seen to be thorough, independent and multi-dimensional. All of these aspects were raised by participants as contributing to trust. The provision of technical information about ISR mining methods during the focus groups reinforced confidence in the wider goals of the research program and that Kapunda project is part of broader research initiative. An important aspect to building trust was that a decision whether to applying for permitting for a potential Kapunda operation would only occur after key research questions had been answered and findings considered and incorporated into a development application. In addition, when participants were informed about the multi-stage assessment process prior to any approval by government, they were further reassured. Part of this is recognising that residents are not locked in to any outcome.

Conversely, participants felt that trust was undermined when there was not full disclosure about the project. This included information related to what is happening, expected timeframes and the scope of the development. Participants understood the uncertainty around some of the issues but still felt it was important to be kept informed. Others were less concerned about receiving regular updates and more interested when conclusive information was available. In each case, adjusting the level and type of engagement is central to building and maintaining trust. Providing honest information about possible benefits and risks was identified as important to maintaining trust.

*trust is an  
issue...do we  
gild the lily  
somewhat? ...  
understate the  
dangers and  
overstate the  
potential?*

## 4.6 Perceived benefits

The focus groups and interviews raised a broad range of perceived benefits from the proposed development. Some of these were tangible benefits such as direct employment. Participants' views on the numbers for potential jobs stemming from the project varied, but tended to be modest, with estimates up to a maximum of 25 jobs. Some participants indicated they need these benefits to be clearly quantified prior to deciding on whether the net value of the project outweighs the disadvantages from their perspective.

There was a sense that, in small town where local school leavers had limited options any growth in employment, beyond existing industries, was seen to be valuable. Participants also thought there would be indirect benefits in the form of stimulus to local businesses due to increased demand for local goods and services. This was sometimes expressed as 'more feet on the street' and would be welcome by shops currently struggling to stay open. Another hypothetical benefit was seen to be revenue to council potentially in the form of royalties or lease fees (e.g., for site access) which could be reinvested in the town.

Some of the perceived benefits were intangible. Participants expressed that they were proud of their mining heritage and that Kaunda had once played an important role in supporting the State's economy. Several participants thought that the original mine was the first commercial mine in operation in Australia and formed a big part of the Town's identity. Opening the first copper ISR operation was seen by many as good for the town's image and would put Kapunda 'on the map' once again. This was partly symbolic – in terms of renewing the mining identity of the mine, and partly practical, in terms of attracting visitors to come and view the operation and put money through the local economy.

A broader societal perceived benefit related to education and development of world leading technologies. The advancement of knowledge relating to ISR methods and environmentally friendly mining methods was seen as beneficial for the town and revenues to the State. In this regard the CRC project that brought together University of Adelaide, CSIRO and mining companies would produce valuable insights, even if the Kapunda ISR mine doesn't proceed.

*it's a great thing for our town...an in-situ business... would be of worldwide interest... we want to be on the map...*

*it brings more feet to Kapunda and our main street in particular, and business here need more feet.*

## 4.7 Perceived impacts

Some participants were concerned about the potential for negative impacts on other sectors, particularly tourism. A new ISR operation would be located on the same site as the original mine which is now a heritage site. Visitors are drawn to the town to visit the historic mine providing a source of business for food and accommodation providers in the town. Participants expected that access to the site would be impacted and this could lead to reduced demand for businesses servicing the tourism industry. Participants noted the previous investment made by Council in making the site suitable for visitors and there was a concern an ISR mine could negate this investment.

A related issue could be that the visual amenity of the site could be reduced, for example through unappealing fencing or unsightly or noisy infrastructure, vehicles and plant equipment. A key consideration here would be the expected duration and extension of disruption to the existing amenity of the site. These issues could also affect fitness classes which currently occur at the site.

The amenity of the site is not only an economic issue affecting other industries. The site is valued as a place of recreation, exercise and where people go to admire the beauty of the coloured water that accumulates in the voids from the heritage mine.

A further set of potential perceived impacts related to the natural environment, in particular the possibility of polluting the aquifer or downstream water quality and possible subsidence. Even so, participants were generally confident that the risk of potential impacts to the natural environment would be managed through the research, approval and assessment process.

A concern was raised that the project may evolve into something bigger or different. For example, the proponents commence by extracting copper however over time they proceed to extracting gold. This could have greater impacts because gold extraction may require different processing and different lixiviants which carry greater risks. A related concern was that the project starts out small with a handful of wells but ends up much bigger in terms of number of drill holes and impact on the landscape. Participants sought reassurance that the opportunity to say 'no' wouldn't become reduced if the scope of the project changed over time.

*I think there's some scepticism in the town as to whether tourism and mining can coexist in one big happy family*

*Can it be done without any damage to the aquifer or ground water?...*



## 4.8 Knowledge of ISR and the proposed development

Participants had diverse levels of understanding about ISR methods from none through to moderate levels. Those with knowledge about ISR had gained their understanding through presentations given by the proponents, internet searches and discussions with other residents. For some participants, the presentation provided by the research team during the focus groups and interviews was their only source of information about the proposed development and ISR mining in general.

Those with some knowledge about ISR methods thought that ISR mining would involve less noise, dust and disruption compared to conventional mining, and avoid creating mining voids. These participants felt that range of lixivants considered for the Kapunda proposal would be low risk, yet they thought other residents be concerned due to problems that had occurred in overseas using different lixivants.

One important knowledge gap for participants was the physical properties of ISR mining. In particular, what happens when you remove the copper from the ground? does this leave gaps that could lead to subsidence? Having technical expertise on hand during the focus groups and interviewed allowed the research team to answer these questions on the day.

The interviews highlighted a general lack of clarity around size and scope of project and the timeframes involved. This largely reflects the fact that these details are generally not yet known due to the early stage. Some people did find this frustrating, because it is more difficult to form a view about a potential development when the details are not yet concrete.

Most participants were comfortable in the knowledge that these details would emerge in due course as a proposal takes shape and the research results come to light. These participants tended to reserve judgment about the project until the facts were in. A variation on this was that some participants expected the project would be a net gain for the town, thinking it was likely that the specifications for the project would be conducive to the town. Other participants were more sceptical and thought that the lack of detail was a sign of withholding information.

*in-situ recovery is different ... if it was conventional mining. You would have people up in arms..."*

*do we know whether this is going to be viable?*

*they're going to take all this stuff out, what are they going to put back in?*

## 4.9 Communication

The focus groups and interviews indicated that, for those who had reached out to the proponents and those participants who had been approached by the proponents directly, communications had been effective to date. However, several of the participants had no prior knowledge of the proposed development and found out about it for the first time when invited to the focus groups.

Participants suggested that as the proposal takes shape it will be important to develop new lines of communication. The focus groups emphasised that different segments of the community have different information and communication needs. These are discussed in more detail in section 5.2.

In terms of communication channels, the focus groups and interviews highlighted that many Kapunda residents are not comfortable using computers and not accustomed to gaining information about the town through this mechanism. Many prefer newspapers and physical brochures as ways to get information about things that affect them in the town.

Visual information will be important for understanding what is happening sub-surface. It will also be useful for explaining the steps in the approval process which many people were not very familiar with.

It was also suggested that there should be ways to ask questions in an anonymous way. Some participants said they had been reluctant to ask questions because they didn't want to reveal their lack of knowledge in front of others. Providing a low risk 'there are no stupid questions' approach would help some residents to help resolve their concerns or express their aspirations. In addition, posting a 'Frequently Asked Questions' statement in the company's shop window and providing paper copies to interest groups would be helpful for those who are not able to access these details information on the company website.

*There needs to be more information out there as the thing progresses.*

*I was going to ask... but I thought they're going to think I'm stupid.*



## 5 Discussion and conclusions

The themes from the interviews are grouped in Figure 5. It shows that there are clusters of themes which relate to established science of social licence, namely procedural fairness, distributional fairness and confidence in governance which serve as preconditions for trust (Zhang et al 2018; Moffat and Zhang, 2014). Impacts and benefits are also generalised as having a separate effect on acceptance. In addition, knowledge of ISR methods and the fit with the town identity are context-specific factors affecting acceptance.

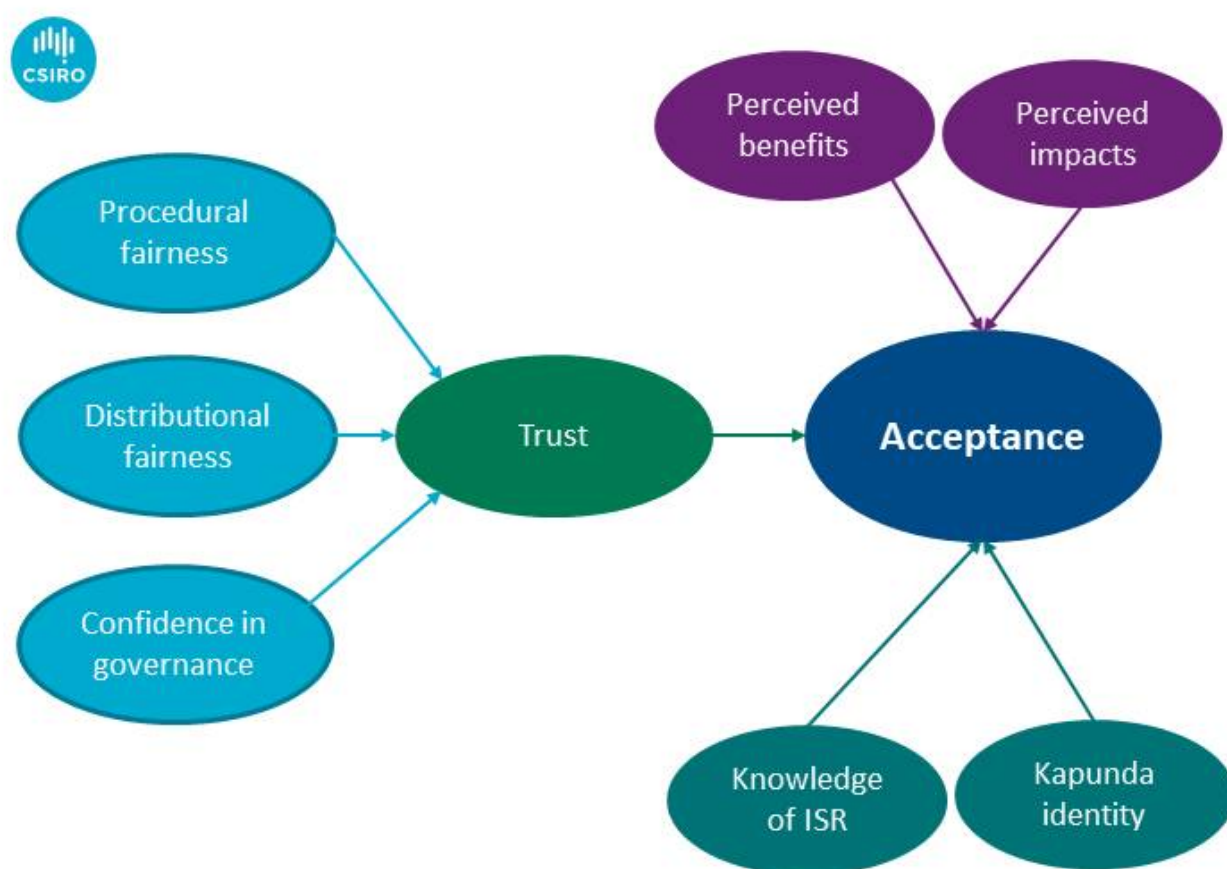


Figure 5 Relationship between interview themes

### 5.1 What does it mean for the town?

The research demonstrated that, in principle, a renewed mining industry would align to the existing values of residents. The identity of the town is strongly connected to historical roots in the mining industry (as well as the pastoral industry). However, the results also emphasised that the relaxed and friendly character of the town is very important so any mining activity would need to

be consistent with this character. It is mining heritage that is important to the people of Kapunda rather than the mining industry as it exists today. This heritage is expressed in memories, photographs and embodied in the former mine site. Renewed mining activity is welcome if it resonates with this heritage and if it doesn't interfere with tranquillity and charm of the town as it stands today.

The sense of pride in the town is also important. The opportunity to be the first copper ISR operation in Australia was seen by many as good for the town's image, provided it was safe and environmentally responsible. It was also thought that hosting the first copper ISR operation would attract a range of visitors -from school students to international study tours- and that this would be good for the economy of the town. There was also an expectation for modest employment opportunities for the town and modest indirect benefits in the form of additional demand for local goods and services.

A number of potential concerns were raised through the interviews and focus groups. These were particularly focused on the potential for disturbance of the current site and reduced visual amenity. Many residents are fond of the historic mine site and would not want it heavily modified or to be faced with large fences, machinery and equipment. These concerns were shared by those who work in tourism and those who use the site for recreation purposes. A key factor here was the expected duration and magnitude of any potential disruption. Some participants also raised concerns about the potential for noise, dust, increased vehicle movements, subsidence and protection of aquifers from any chemicals used in the extraction process. For most participants this was a matter of re-assuring them that these issues were being avoided or managed effectively.

## 5.2 What does it mean for the proponents?

### **Most participants were cautiously receptive**

The data from the social research process demonstrate that most participants are open to the prospect of a new copper ISR operation, provided it is well managed and environmentally responsible. Participants generally conveyed a high degree of confidence in the research process currently being undertaken and in the assessment processes conducted by regulators such that the mine would only go ahead if it met all appropriate safeguards.

### **Listening to concerns**

The research demonstrated that only a minority of the town had heard about the potential new copper ISR operation. Among those who had heard of it, most could see benefits for the town in general and/or individual businesses which may benefit in the supply chain by providing goods and services to the operation. Others had never heard of the proposed Copper ISR operations but were happy enough to consider something that could be good for the town. Some who had heard of the potential Copper ISR operation and raised concerns either in terms of socio-economic

effects or environmental effects. The science of social licence clearly demonstrates the importance of early and effective community engagement and listening to the concerns of all residents are important, whether or not the proponents agree with the concerns (Zhang et al 2018). The science of social licence also clearly shows that attempting to address those concerns in a way that meets community expectations is crucial to maintaining a social licence. Where it is unfeasible to address concerns that meets local expectations, it is important to recognise the concern and explain why the proponents have taken a particular course of action. Residents may not like a certain course of action, but they are more likely to accept it if they know that their voice has been heard and there is a reasonable explanation for the course of action taken.

## **Communication**

Different members of the community have different levels of interest as reflected in Figure 6. One of the most affected groups are those residents living close to the site for the proposed ISR operation. These people will have distinct concerns and need to be listened to and communicated with separately.

Other members of the community who are interested but not directly affected are seeking updates on what's happening with regard to science information, field trials and the approvals process. People in this segment would like to be kept informed particularly once something conclusive becomes known about the viability or characteristics of the project.

A third segment are those who are not very interested and not much affected. These people may not have strong views on the proposed new development either way. Even though they may not seek much information about the project they may like to have the option to find out more, knowing that the information is available if they want it. They would generally only become more interested if things were to proceed. A considerable proportion of the population may fall into this category.

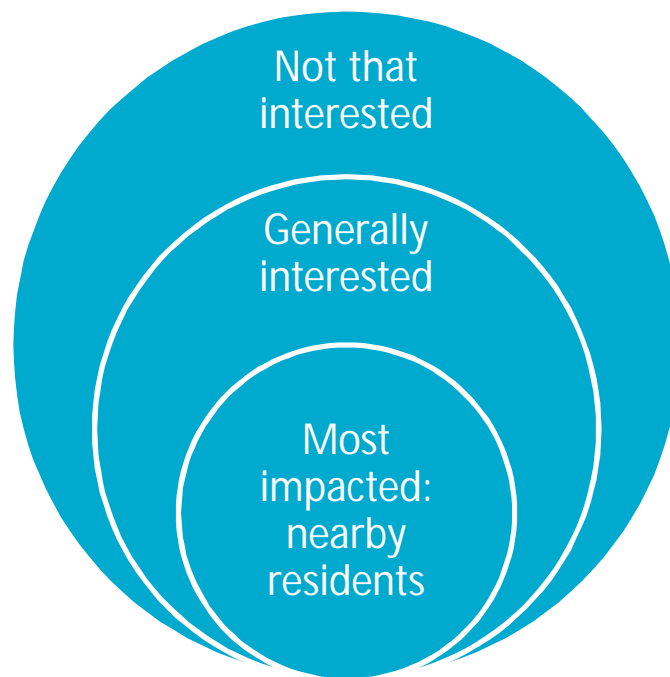


Figure 6 Levels of impact and interest for communication

### **Avoid overstating benefits and minimising risks**

Most participants had a sense of realism about the potential for economic effects and conveyed a sense that even modest benefits would contribute to maintaining the prosperity of the town. There were some exceptions: some participants were concerned that the proponents may have overstated the benefits and understated the risks. This perception seemed to stem from a perception that the proponents had been selective about their engagement with residents, allegedly favouring those who stood to gain from the proposed mine. To address this concern (regardless of whether it is accurate or not) the key issue is to be clear in stating the expected effects and not overstating benefits nor belittling risks. As discussed in the previous section, the science of social licence shows that recognising perceived concerns and being clear about how they are being managed contributes to building trust (Moffat and Zhang, 2014).

The physical proximity of the site, which is located close to the centre of town, places greater attention to the potential environmental implications of the proposed development, particularly for issues such as dust, noise and vehicle movements. In addition to technical solutions, managing these issues requires a high levels of trust in the science, the assessment process and the proponents. Maintaining this trust will be aided by being transparent about the findings from the research process and through effective and ongoing community engagement processes to understand any emerging issues or changing concerns. A key part of trust in a small community such as Kapunda is whether the community believes that the way different members of the community are treated is fair.

### 5.3 What does it mean for research?

From a social science perspective, it is important to recognise that the proponents are seeking to engage early on the social, economic and environmental feasibility of In Situ Recovery, well before a development application is on the drafting blocks. This aligns well with the principle of 'engage early and effectively' (Hartley and Wood, 2005; Zhang et al. 2018). In principle, the advantage of this approach is that it provides more time for the proponents of developments to consider the views, aspirations and potential concerns of residents and other stakeholders, and to adjust their plans to align to those views. Alternatively, if there are irreconcilable differences in views and it does not make sense to proceed with a development, then there is a lower opportunity cost ceasing a development earlier rather than later in the development process. The advantage of early and effective engagement for residents and stakeholders is that there is a greater chance to influence the way an emerging development takes shape and have their concerns and aspirations addressed along the way. What this case study highlights is that early engagement is also important from the perspective of starting from a position of relative trust. Generally, most participants were either supportive or indifferent to the proposed development and expected that any concerns that emerge will be addressed during the research, assessment and approval process. There was a strong sense with this project that the outcome is far from decided and would only proceed if appropriate conditions were in place.

The disadvantage of early engagement is the degree of uncertainty about the potential implications of future development. Some participants were seeking concrete answers to questions about timeframes, logistics and environmental specifications. For example, the selection of lixiviant is an important consideration in ISR methods with diverse implications depending on the chemistry involved. At the time of conducting the research it was only possible to consider general responses to these types of questions and ask the participants about their perspectives on the issue. This was sometimes frustrating for participants who favoured hard and fast answers. However, such frustrations were few and overall most participants were cautiously optimistic towards the potential development with an eagerness to learn more as the research process proceeds.

### 5.4 Conclusion

The focus groups and interviews demonstrated that renewed mining activity in the town of Kapunda would generally align to town existing values and identity provided it was done in a way that maintained the character of the town, including the historical links to mining, the sense of pride in the town, and friendly and relaxed lifestyle that locals value. Furthermore, the data showed that participants are generally open to the potential for ISR methods to be employed provided all the necessary science had been completed and impacts managed. A wide range of potential benefits were identified, some of which were tangible, such as modest employment. Other perceived benefits were intangible, such as a sense of pride and renewing the town's mining heritage by being the first ISR copper mine in Australia. The research also brought attention to a number of concerns. Some of these were widely recognised issues that arise across diverse mining projects, such as potential for noise and dust. Other concerns were quite specific to ISR mining,

such as what sort of lixiviant may be used and how it may affect the groundwater. Overall, community confidence in the research, assessment and approval processes surrounding the project was high, and residents generally felt that the project would only proceed if concerns were adequately addressed. To maintain this level of confidence, it will be important for the proponents to be transparent about the findings of the research program and their plans. It will be important to engage with different segments of the community as the proposed development evolves.

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# Appendix 1: Guiding questions for focus groups and interviews

Topics	Roles	Time (focus groups/ interviews)
<b>Initial identity exploration</b> <i>What do you like about living here in Kapunda?</i> <i>What's not so good?</i> <i>How do you generally view the mining sector?</i> <i>How does mining fit with the town's identity?</i> <i>How would a renewed mining industry align with town values?</i>	Facilitated by senior CSIRO social scientist	45 min/20 min
<b>Introduction to proposed renewed activity, including ISR technology</b> <i>Presentation about ISR technology</i> <i>The CRC and proposed activity in Kapunda</i>	By senior CSIRO scientist with geology and chemistry background	15 min/15 min
Focus groups only: 10 minutes break in proceedings		
<b>Exploration of perceptions of ISR</b> Do you have concerns about ISR: <i>In general?</i> <i>As part of renewed mining activity in Kapunda?</i> Do you see benefits from ISR: <i>In general?</i> <i>As part of renewed mining activity in Kapunda?</i>	Facilitated by senior CSIRO social scientist	45 min/20 min
<b>Concluding interactions</b> Do you have any other comments: <i>About Kapunda?</i> <i>Mining in general?</i> <i>ISR?</i> <i>The proposed mining activity for Kapunda, using ISR?</i> Summary of what happens next: <i>The social research process</i> <i>Sharing results with participants and other audiences, including the CRC</i>	Facilitated by senior CSIRO social scientist	10 min/5 min

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