

Waikato District Council
Private Bag 544
Ngaruawahia

Attention: Will Gauntlett, Clive Morgan

Dear Will/Clive

Proposed Waikato District Plan - Stage 2
Chapter 15.11 Mine Subsidence Risk Area
Specialist Input Review

1 Introduction and Purpose of Report

Waikato District Council publicly notified Stage 2 (Natural Hazards) of the Proposed Waikato District Plan on the 30 November 2020, and further submissions closed on 14 December 2020.

Waikato District Council have engaged Tonkin & Taylor Limited (T+T) to undertake a technical review of the submissions received as per the contract dated the 20th of January 2021 (reference PSP000185).

This letter report will support the s42A report prepared by Grant Eccles of T+T, and it is prepared by Doug Johnson, Principal Engineering Geologist.

Qualifications and Experience

My name is James Douglas Johnson (known as Doug). I hold a master's degree (hon) in Engineering Geology from the University of Canterbury and have been working as an engineering geologist since 1984. I am a Chartered Member (PEngGeol) of Engineering NZ, a member of International Association of Engineering Geology, and NZ Geotechnical Society. My specialist areas of practice include engineering geological assessments, site investigation, soil and rock mechanics, slope stability, groundwater, and natural hazard (including seismic) assessment. I am currently employed by T+T in dual roles of Managing Director and Principal Engineering Geologist.

I have specific experience in NZ coal mining having worked for Coal Corporation of NZ between 1986-1990 (before becoming Solid Energy) at Huntly/Rotowaro, and as an Engineering Geologist employed by T+T since 1995 consulting extensively on mine design for Solid Energy operations at Huntly/Rotowaro, Maramarua, Stockton/Cypress and Ohai. I have also worked on Waka Kotahi NZ Transport Agency projects in the Huntly/North Waikato area.

I have reviewed the submissions, and identified the submissions that require expert input in Appendix A.

2 Review of Hazard Reporting for Subsidence and Gas Emission to land use above underground workings

2.1 Source Information

I have reviewed the reports prepared by IRBA, TerraFirma and RDCL. These reports form the basis for the proposed Mine Subsidence Risk Area overlay and associated provisions. In undertaking this review, I have used the information contained in the three reports and drawn on my own experience of working in the Coal mining operations in the Huntly area. I have not undertaken further investigations or analysis nor checked the accuracy of source data used in these reports. I have not undertaken a site visit to the individual submitter's sites.

The documents I have reviewed are:

- IRBA – “Report on hazards following mine closure, Huntly East, Project 1003” for Waikato District Council, dated October 2018.
- TerraFirma – “Peer Review of Ian Brown Associates report titled Report on hazards following mine closure, Huntly East October 2018 Project 1003” for Waikato District Council, reference TFM0096, dated 8 January 2019.
- RDCL – “Report on: Risk Assessment for Urban area above the Mine – Project: Huntly East Mine Closure Assessment” for Waikato District Council, reference R-19357-01, dated 14 October 2019.
- Plan comparison of operative mine subsidence and proposed mine subsidence overlays.

In summary, the reports are consistent in the reporting and assessments of hazard and risk and in my opinion are to a high standard given the information available. I note the IRBA and TerraFirma reports are principally focused on hazard identification and more qualitative risk assessment and the RDCL report provides a more quantitative framework for evaluation of risk using ISO 31000.

I do have some additional commentary to make on the reports and how these may, or may not, influence hazard and risk zonation above the old mine workings as noted below.

2.2 Comment on Subsidence Hazard and Risk

2.2.1 General comment

Surface subsidence is recognised as a hazard above areas of underground coal extraction. The extent, magnitude, and shape of any maximum potential subsidence is a function of the volume of coal extracted, the depth of extraction, and the strength of the strata immediately below and above the coal extraction.

It is important to note the extent of the ground that may be affected by collapse settlement above old workings extends beyond the edge of the mining activity (at the coal seam level) and is projected up to the surface at the angle of draw as shown on Figure 2.1. The angle of draw is a function of the mass strength of the strata above the coal extraction and for the Waikato Coal measures in the Huntly area is generally accepted as 42 degrees. Illustrations of the subsidence mechanism and shape of the depression and how this varies are shown on Figure 2.1 and Figure 2.2.

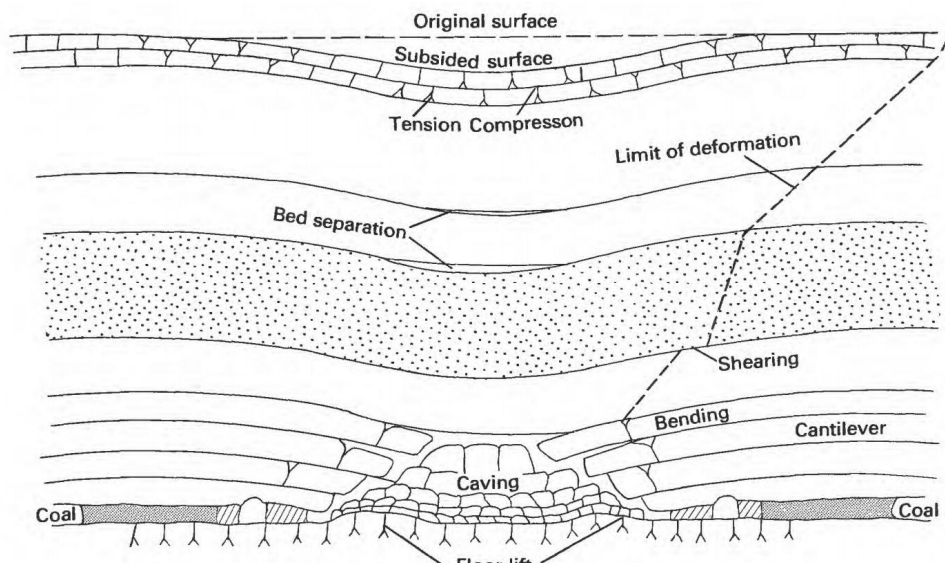


Figure 2.1: Deformation produced in rock above and below an extracted coal seam¹

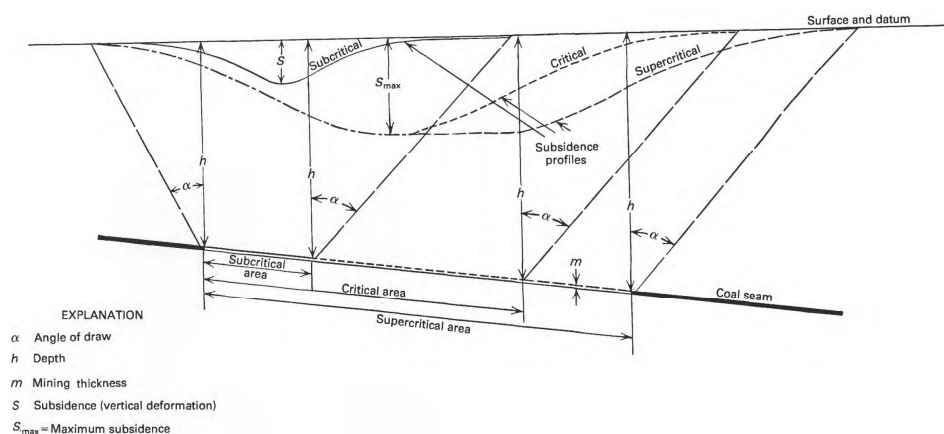


Figure 2.2: Description of subsidence over long wall coal seam mining¹

In general, the collapse of the strata into the mine void occurs immediately or soon after mining and generally reduces over time as the ground adjusts to changed stress conditions. The greater the extent and thickness of coal removed, the more extensive collapse is likely to be. However, depending on the mining methods used not all voids may collapse or might only partially collapse. Not all collapsed voids may have a surface expression, depending on factors such as size of the original void, the extent of ground collapse and its depth. And in some cases, it may take time for some collapse features to migrate and result in a surface expression. Furthermore, subsidence can be reactivated due to changes in ground conditions and changes to stress states over time. Saturation or dewatering of a mine, and events such as an earthquake, are common causes of changes in ground conditions and stress state that triggers reactivation of collapse settlement.

¹ Extract from: Lee F.T. and Able J.F. "Subsidence from underground mining environmental analysis and planning considerations" US department of the Interior Geological Survey Circular 876

The extent of underground workings and current surface deformation associated with the Huntly East mine is well defined as shown on Figure 3 of the IRBA report - reproduced here as Figure 2.3.

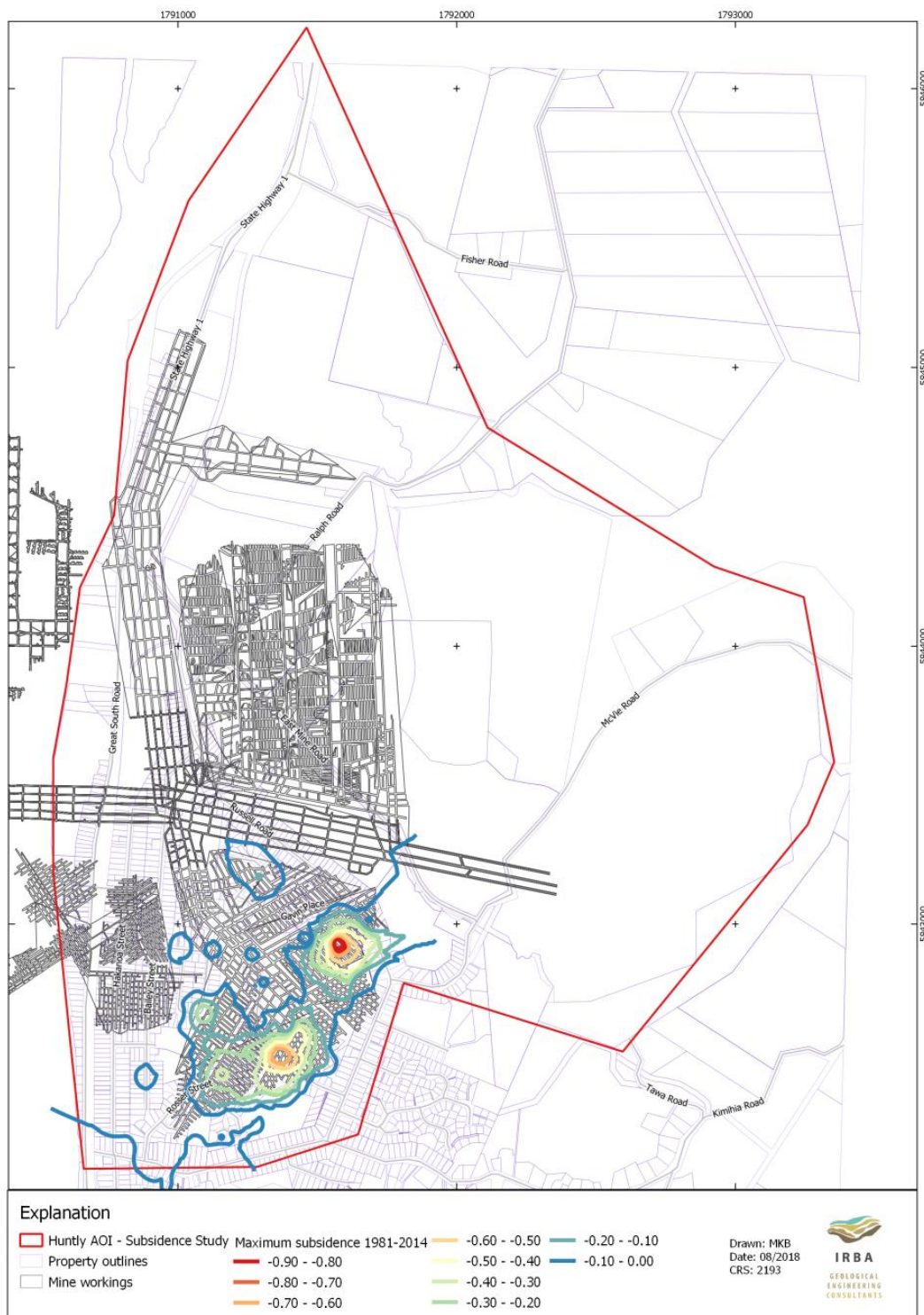


Figure 2.3: Plan showing extent of Huntly East Mine working below Huntly township and measured surface deformations 1981 to 2014² (reproduced from IRBA 2018 report)

² We understand surface subsidence monitoring only extends over the southern Headings (Zones A and B described below)

The mining methods at Huntly East are well understood, as were the ground conditions at the time of coal extraction. For the Huntly East mine this is well summarised in the RDCL report and summarised on Figure 6 (reproduced here as Figure 2.4).



Figure 2.4: Zones showing different mining methods at Huntly East Mine – reproduced from 2019 RDCL report.

Noting:

- Zone A represents the shallowest coal (approx. 100 m below surface) with coal extraction using small room and pillar methods. Mining in this area has resulted in measured surface settlements up to 1 m (see Figure 2.3 above). The IRBA report notes that the rates of

measured settlement have reduced over time, suggesting the ground response above these workings has reached, or is close to an equilibrium state. Voids or partial collapse zones will still exist below this area and the possibility of further surface subsidence is possible.

- Zone B is characterised by the mining of deeper coal (depth to coal increasing to the north and north-east) and a change in mining methods using larger pillars (reduced coal extraction). I understand the mining methods were changed following observed surface subsidence affecting urban land use in Zone A. The leaving of larger pillars and reduced coal extraction were adopted to reduce the likelihood of surface settlement. There is no record of significant (<10 mm) surface movement. Nevertheless, there will be voids and/or partially collapsed ground below this area the possibility of further surface subsidence is possible (albeit the likelihood of collapse leading to surface expression is assessed as less than Zone A).
- Zone C is to the north where higher coal volumes were extracted using long wall mining methods. There is limited surface settlement survey data for this area, but we understand (and would expect based on theoretical calculations) there to have been general surface settlement of the order of 1 – 2 m across much of this area. Given the nature of the longwall methods (collapsing the roof as mining is advanced between panels) the settlement would have likely happened at the time of or very soon after mining. Zone C is below rural land and mining avoided surface infrastructure with no long wall extraction below critical surface infrastructure (such as road and rail or the river). While surface settlement would have been expected to have occurred in this area already, the potential for future ground settlement cannot be discounted.
- Mine Roadways are also shown on Figure 2.4. These are designed for safe mine entry and egress, ventilation, and for conveyor belts. These roadways are generally designed and built to a high standard to minimise the risk of collapse for safe mine operations. Although the drives would be expected to be open these should have a low likelihood of void collapse.

In considering the areas at increased risk to surface subsidence due to underground mining, the angle of draw needs to be considered with the potential effect (while reducing with distance) extending beyond the edge of the workings. For example, mining a 100 m deep coal seam could have an effect at surface up to 90 m beyond the edge of the workings.

In conclusion key points to note from the above are that:

- The extent of underground working associated with the Huntly East Mine are well defined.
- The potential for subsidence above the old workings exists.
- Surface subsidence has been observed above the East Mine workings.
- Surface effects can extend beyond the edge of the workings.
- Not all areas have measured subsidence, however, if no collapse settlement has occurred to date it does not mean it will not happen. However, while the consequences of subsidence remain common across the area, the different depth and mining practices makes for different likelihood of surface subsidence. Hence the subsidence risk profiles do vary across the site.
- Flooding of the East Mine (expected to take 5 years or so) will change the stress state and the ground condition above the old workings will change. This has the potential to reactivate subsidence processes and increases the risk of surface settlement.
- The greatest risk for reactivation of settlement is in Zone A (shallower coal where higher rates of coal extraction have already caused some surface settlements), with a lower (but still credible) risk for Zone B.
- The risk of surface movement above the roadways should remain low even with flooding.

- As time progresses, once the mine is fully flooded and the stress states and ground condition have reached a steady state, the risk of reactivation of collapse and any rates of surface settlement should reduce.

The above risks can be addressed and managed by appropriate building rules and regulations already in place for the Huntly subsidence area. Mitigation measures are well summarised in Section 7.2 of RDCL 2019 report and are not repeated here.

The above discussion is solely focused on the East Mine workings. Figures show older workings also exist to the west of the East Mine south workings. I understand these to be part of the historic Ralph Mine workings and have been long since flooded. The historic Ralph Mine workings are separated from the East Mine workings by a major north-south trending fault (that delineates the western extent of the East Mine southern workings). These workings are outside of the East Mine Subsidence area and no ground settlement has been reported above these workings. Thus, neither the Operative nor Proposed District Plan rules apply to these workings. Therefore, these workings are not addressed by this report as the scope of the above reporting was specifically to address East Mine workings and closure.

2.3 Comment on Gas Hazard and Risk

This issue is well discussed in the respective reports and the potential for gas to be trapped underground is documented. The mine has been sealed to prevent oxygen entering the mine reducing the risk of spontaneous coal combustion and gas ignition. The gas mixtures in the mine are understood to be at safe levels. However, the potential for gas to be trapped in the high points of workings as water levels rise in the working is recognised noting the trapping of and release of gas to surface is theoretically possible but has not been proven.

The risk of gas escaping is most likely where there is fractured ground above the workings and/or old drill holes. The gas is a risk only where the gasses being pushed out are trapped within poorly ventilated surface or near surface structures. Specifically, Carbon Dioxide (CO₂) which can accumulate at the base of confined spaces and methane (which is lighter gas) that can accumulate at the top of confined spaces. Areas with open access and free air movement (well ventilated areas) are unlikely to pose any risk. Underground infrastructure such as drains, and sewer pipes and similar subsurface structures are most at risk. Noting that other sources of gas can also cause accumulation of dangerous atmosphere in these confined spaces so the presence of CO₂ or Methane in these structures may not related to old workings (and perhaps are more likely to be from other sources).

The nature and mechanisms of gas migration is such that gas can migrate via weakness in the ground and while most likely to be upwards, the potential for lateral migration cannot be discounted. This could mean that gas accumulation, if it happens, could affect an area wider than the old workings.

As noted in the RDCL report, the risk of gas from underground workings is assessed as low, and can be (and should be) managed by standard confined space entry practices. Air quality checks should be mandatory before entry to any confined spaces (whether above old workings or not) and other sources of gas are equally or more likely to pose a risk to safe confined site access.

In my view the gas risk delineation above the subsidence zone is noteworthy but in itself unlikely to impact on construction and land use. The risk can and should be managed by standard (mandatory) confined space access rules and regulations under Health and Safety legislation. My view aligns with the finding of the RDCL report.

To conclude, the risk of combustion underground has been controlled by flooding the workings and by the sealing of the mine to prevent oxygen ingress. The trapping of the gas and its potential to

escape is very unlikely to affect surface settlements. All confined spaces should be tested before entry in accordance with Health and Safety regulations (un-related to mine subsidence area).

2.4 Subsidence Notation

The subsidence notation in the Proposed District Plan (Stage 2 provisions as notified) is delineated by an area where the old workings of the Huntly East Mine underly urban development. The extent of the subsidence notation in the Operative Waikato District Plan is defined by areas where the ground movement have been measured and where it could credibly occur due to the nature of the mining methods used.

The extent of the subsidence notation in the Proposed District Plan (Stage 2 provisions as notified) makes no differentiation for different areas of subsidence risk and now incorporates mine roadways and areas of potential gas accumulation.

A comparison of the operative Huntly East Mine subsidence overlay, and the proposed East Mine subsidence risk area overlay, is shown on Figure 2.5 and Figure 2.6 below.

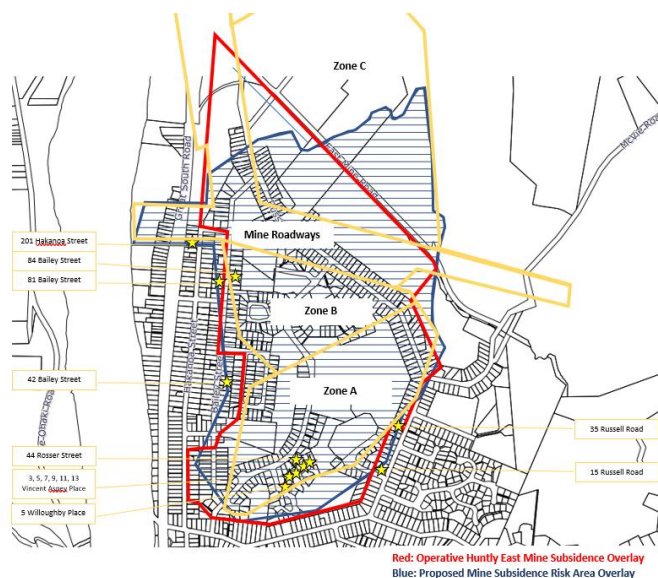


Figure 2.5: Huntly East Mine Subsidence Area Overlays compared with the different risk zones for surface subsidence identified by RDCL (Zones A to C and Roadways).

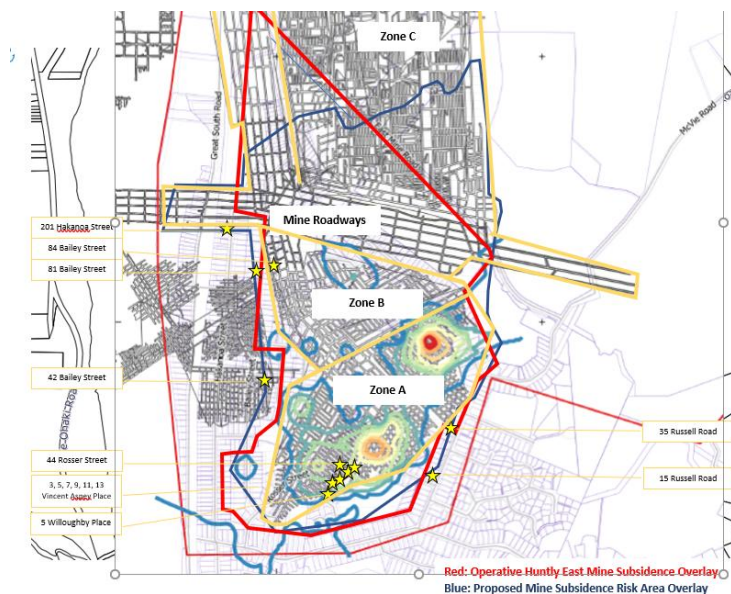


Figure 2.6: Huntly East Mine Subsidence Area Overlays compared extent of the old working and observed settlement information.

Both overlays include areas of measured settlement and extend out over most of the areas of mine ground related to the East Mine workings (East of the river). Neither plan includes the Historic workings to the West (beyond the scope of these studies).

There are however differences between the existing and proposed overlays as follows:

- The northern boundaries are quite different. Both extend across undeveloped land to the north above areas of long wall mining (areas in Zone C), but neither include all of Zone C. The overlays have very different interpretations at the northern end of East Mine Road. If all of Zone C is not to be included, then I see more justification for using the East Mine Road boundary (as the existing overlay allows for) as a delineator of the northern limit.
- The proposed Mine Subsidence Risk Area overlay extends to the west of the current Huntly East Mine Subsidence Area overlay where the roadways head west and go under the river. This is an area of very low subsidence risk as noted above and by RDCL. But it is an area where gas accumulation may occur as noted by IRBA. It is true that underground roadways and drives underlie this area, however, the subsidence risk in this area is significantly lower (by an order to magnitude) than for Zones A and B. Noting the risk of gas, in my opinion, does not increase the risk of subsidence and the gas accumulation potential (if it does in fact occur) is not sufficient in my understanding to result in these properties being subject to the same subsidence rules as those in Zones A and B.
- To the south, about Zones A and B the overlays are similar (but not the same). The main difference in my interpretation is that the operative overlay has been matched to property boundaries and road networks so that properties fall either completely within or outside of the subsidence area. The proposed change is largely based on a projection up from the old workings and in many places, this results in the boundary crossing through properties (such that different rules will apply to different parts of the property). Within the accuracy of defining the extent of subsidence effects and without redoing this work (beyond the scope of the review) I consider these to be broadly similar, given the differences are at the margins where any effects are likely to be small (e.g. <10mm). However, the current operative overlay is likely to be much easier to administer and clearer to property owners and developers.

3 Comment on Mine Subsidence Submissions and Further Submissions Addressed

3.1 General

Five of the submitters own private properties which fall outside of the operative Huntly East Mine Subsidence Area overlay but now fall within the proposed Mine Subsidence Risk Area overlay. The majority of these have been captured by how the new overlay has been defined rather than a change in how risk is assessed and managed. These 5 properties are all in areas of low risk to subsidence and have very different risk profiles to the areas within the current boundaries defined by Zones A and B on the Figures above.

The remaining private submitters all fall within both the operative and proposed subsidence overlays.

3.2 Specific comment on Private Property submissions

The following seven (opposing and supporting) submissions were received querying / challenging the presence (and revised layout) of the Mine Subsidence Risk Area overlay on their properties:

- 2024 (2024.1) – Elaine & Eric Wright – 81 Bailey Street, Huntly.
This property is outside the operative overlay but now inside the proposed overlay due to redefined boundaries. The site is not over workings but close to the potential extent of subsidence in Zone B. I consider this site at low to very low risk for settlement compared to other properties in the subsidence zone and there has been no measured settlement in this area.
- 2032 (2032.1) – Blair Everett – 201 Hakanoa Street, Huntly.
This property is outside the operative overlay but now inside the proposed overlay due to redefined boundaries and an extension of the subsidence risk zone in this area to include mine roadways previously excluded. This property is above or very close to access roadways and is considered at very low risk for settlement, and there has been no measured settlement effects in this area. This area is included in the IRBA area of potential gas accumulation but as noted in Section 2 above this is not considered to impact subsidence risk.
- 2064 (2064.1) – Tamara Pairaudeau – 15 Russell Road, Huntly.
This property is outside the operative overlay but now inside the proposed overlay due to redefined boundaries. No workings exist below this property, but it is at the very edge of the area that could be affected by angle of draw above Zone A workings. There is no measured settlement at the property, but it is nearby to areas of measured settlement in Zone A. Given the property is located on the very edge of the possible subsidence area I consider this property is at a low risk to subsidence effects.
- 2090 (2090.1) – Scott Foster – 42 Bailey Street, Huntly.
This property is outside the operative overlay but now inside the proposed overlay due to redefined boundaries. The site is not over Huntly East Mine workings but is above the old Ralph Mine workings. In terms of risk from the East Mine subsidence it is likely to be outside (or at worst on the very edge of) potential effects due to large scale subsidence in Zone B. I consider the risk for this property to be low compared to other properties in the Mine Subsidence Risk Area overlay.
- 2120 (2120.1), 2145 (2145.1) – Sushil Kumar – 35 Russell Road, Huntly.

This property is on the boundary of the operative and the proposed overlay. No workings exist below this property, but it is at the very edge of the area that could be affected by angle of draw above Zone A workings. There is no measured settlement at the property, but it is nearby to areas of measured settlement in Zone A. Given the properties location at the very edge of the possible subsidence area I consider this property is at a low risk to subsidence effects.

- 2177 (2177.1) – Dennis Warrick Young – 44 Rosser Street; 3, 5, 7, 9, 11, 13 Vincent Aspley Place; and 5 Willoughby Place, Huntly.

These properties are all squarely within Zone A and nearby to some properties affected by measured surface settlements. These properties are in the area most at risk to ongoing or renewed subsidence and should remain within the subsidence overlay.

Refer to Appendix A for the submission summaries.

3.3 Methodology

An opposing submission was received from the Huntly Community Board challenging the methodology of the Mine Subsidence Risk Area overlay:

- 2189 (2189.1) – David Whyte – Huntly Community Board

Decision sought: *Amend section 15.11 Mine Subsidence Risk Area Overlay. Reduce overlay of subsidence risk modelling to align with the boundaries already identified by the Huntly Subsidence Zone. There is no need to expand this zone as is proposed.*

Reason: *“There is a better way to mitigate hazards produced by the now closed mine. The 2018 report used as the rationale for the change is not in line with other reports expert knowledge within the community. If the mine was still in operation, the risks for subsidence inside the zone would be the same as that outside the zone. This is backed up by expert reports. Local knowledge indicates that the mine was closer to the surface (less than 100m depth) compared to other mine workings and therefore probability of subsidence outside the zone is low. The mine system must almost be fully flooded. Trapped gas does not equate to subsidence risk. Entrapped gas is not cause to expand the subsidence area. Concrete data cannot be determined from probabilities and science carries a level of uncertainty. There are negative impacts of extending the zone, and the zone extension will have real world consequences for Huntly, lowering land values.*

The differences between the current operative mine subsidence area and the proposed mine subsidence risk overlay are discussed in Section 2.4 above. Both overlays cover the area most at risk to surface subsidence due to collapse of the old East Mine underground workings.

The differences are largely on how the boundary edge effects are managed about mine Zones A and B and in the areas where roadway and drives extend west of the main south workings and continue under the river. About Zones A and B, the difference between the two overlays, from a technical / risk perspective at the margins is small. The main differences between the operative and proposed overlays is how they relate to property boundaries. The new overlay may be difficult to manage compared to the current mine subsidence overlay (which follows property boundaries). The properties above the old roadways and access drives included in the proposed overlay but excluded from the operative overlay are above workings but have a much lower risk profile than those within the main subsidence area. If included at all, there is a case for these properties to be recognised as at a lower risk.

I agree with the submission that gas impacts are unlikely to impact subsidence risk and can be managed differently. I agree that gas accumulation should not be a factor that influences the extent

of the subsidence overlay and that this should be generally regulated by confined space access rules and new buildings with underfloor cavities by building regulations and ventilation requirements.

The expert reports have applied robust methodology in their work and their reports are to a high standard within the briefs they have been working to. However, it is the translation of the different risks to the management zones defined by the operative and proposed overlays where the variable risks are managed differently.

I consider for ease of boundary management and to better reflect the different risk profiles across the site that there is a case to maintain the operative subsidence overlay as proposed by the Huntly Community Board.

4 Conclusions

In conclusion:

- The subsidence risks associated with the Huntly East Mine are well defined and understood.
- The differences between the operative Huntly East Mine Subsidence Area overlay and the proposed Mine Subsidence Risk Area overlay are predominantly related to different interpretations of how the risk of subsidence is managed about the edge of the potential subsidence and where the risks are lowest.
- The operative Huntly East Mine Subsidence Area overlay provides for the most practical management of the subsidence risk (by virtue of the boundaries of the overlay aligning with property boundaries).
- The group of properties that submitted against inclusion within both the operative and proposed subsidence overlays should be rejected. They should remain within the subsidence zone.
- Properties outside of the operative overlay but within the proposed overlay are at low risk to subsidence.
- If the new overlay is adopted, I consider the properties now added to the subsidence zone should be recognised as being at a lower risk and should be treated differently compared to the properties within the operative overlay with known subsidence. The five submitters from properties in this area should be recognised as being at lower risk than those properties within the current subsidence zone.
- If the proposed Mine Subsidence Risk Area overlay is adopted, it will require modification as it currently crosses through properties and will be difficult to interpret and administer.
- I do not consider gas accumulation is a risk to subsidence and it should not be used for subsidence zoning management purposes.

5 Applicability

This report has been prepared for the exclusive use of our client Waikato District Council, with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose, or by any person other than our client, without our prior written agreement.

We understand and agree that this report will be used by Waikato District Council in undertaking its regulatory functions in connection with the Proposed Waikato District Plan.

Tonkin & Taylor Ltd

Environmental and Engineering Consultants

Report prepared by:

Authorised for Tonkin & Taylor Ltd by:



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pp Doug Johnson
Principal Engineering Geologist



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Glen Nicholson
Project Director

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Appendix A: Mine Subsidence Submissions

Specific Properties

Sub no.	Point no.	Name	Organisation	On Behalf Of	Support/ Oppose	Decision Sought	Reason	Provision No.	Primary Plan Section	Secondary Plan Section
2024	2024.1	Elaine & Eric Wright			Support	Amend Map 20.2 Huntly East to remove Mine Subsidence Risk Area off 81 Bailey Street, Huntly.	Investigations were done when the house was built in 2006.	Map 20.2 Huntly East	Maps- Mine Subsidence Risk Area	
3032	<i>Renee Laker on behalf of Timberline Contracting</i>		<i>Timberline Contracting</i>	<i>OS 2024.1</i>	<i>FS3032.1</i>	<i>FS3032.1</i>	<i>Support</i>	<i>Support OS 2024.1</i>	<i>The Huntly mine subsidence has been inappropriately modelled and mapped, and apply to properties that are not at risk.</i>	<i>Mine Subsidence</i>

Sub no.	Point no.	Name	Organisation	On Behalf Of	Support/ Oppose	Decision Sought	Reason	Provision No.	Primary Plan Section	Secondary Plan Section
2032	2032.1	Blair Everett			Support	Amend the Mine Subsidence Risk Area overlay on Map 20.2 Huntly East by removing the overlay area entirely from the property at 201 Hakanoa St.	<ul style="list-style-type: none"> • The mine subsidence risk area runs through the middle of the submitters property and they wish for it to be moved over 10 metres to exclude their property. • The submitter is concerned about their ability to subdivide in the future. They feel this is causing unnecessary stress on their family. • The submitters insurance company have indicated that they will refuse to insure their property if this goes ahead due to it not meeting the terms and conditions of the mortgage. This will force the submitter to sell urgently. 	Map 20.2 - Huntly East	Maps- Mine Subsidence Risk Area	
3032	<i>Renee Laker on behalf of Timberline Contracting</i>		<i>Timberline Contracting</i>	<i>OS 2032.1</i>	<i>FS3032.2</i>	<i>FS3032.2</i>	<i>Support</i>	<i>Support OS 2032.1</i>	<i>The Huntly mine subsidence has been inappropriately modelled and mapped, and apply to properties that are not at risk.</i>	<i>Mine Subsidence</i>

Sub no.	Point no.	Name	Organisation	On Behalf Of	Support/ Oppose	Decision Sought	Reason	Provision No.	Primary Plan Section	Secondary Plan Section
2064	2064.1	Tamara Pairaudeau			Oppose	Amend Map 20.2 Huntly East to exclude 15 Russell Road, Huntly from the Mine Subsidence Risk Zone.	The property was built and established in the early 1940s and did not have any historic underground coal mining activities undertaken on the land.	Map 20.2 – Huntly East	Maps – Mine Subsidence Risk Area	
3032	<i>Renee Laker on behalf of Timberline Contracting</i>		<i>Timberline Contracting</i>	<i>OS 2064.1</i>	<i>FS3032.4</i>	<i>FS3032.4</i>	<i>Support</i>	<i>Support OS 2064.1</i>	<i>The Huntly mine subsidence has been inappropriately modelled and mapped, and apply to properties that are not at risk.</i>	<i>Mine Subsidence</i>
2090	2090.1	Scott Foster			Support	Clarification sought on the determination of the Mine Subsidence Risk Area boundary within 42 Bailey Street Huntly. And Potentially amend the Mine Subsidence Risk Area within 42 Bailey Street, Huntly.	<ul style="list-style-type: none"> • The submitter seeks information on the determination of the policy area boundary. • The submitter seeks further information confirming why the location of the new policy area is different from the operative plan. 	Map 20.2 Huntly East	Maps- Mine Subsidence Risk Area	

Sub no.	Point no.	Name	Organisation	On Behalf Of	Support/ Oppose	Decision Sought	Reason	Provision No.	Primary Plan Section	Secondary Plan Section
3032	<i>Renee Laker on behalf of Timberline Contracting</i>		<i>Timberline Contracting</i>	<i>OS 2090.1</i>	<i>FS3032.5</i>	<i>FS3032.5</i>	<i>Support</i>	<i>Support OS 2090.1</i>	<i>The Huntly mine subsidence has been inappropriately modelled and mapped, and apply to properties that are not at risk.</i>	<i>Mine Subsidence</i>
2120	2120.1	Sushil Kumar			Oppose	Amend Planning Map 20.2 - Huntly East so that Mine Subsidence Risk Area does not affect the area around the property located at 35 Russell Road Huntly.	<ul style="list-style-type: none"> • Submitter concerned over the effect on properties value and questions whether government will pay for the value loss of the property. • Submitter has not felt any movements or been affected by mine subsidence at this property for the past ten years." 	Map 20.2 – Huntly East	Maps – Mine Subsidence Risk Area	
3032	<i>Renee Laker on behalf of Timberline Contracting</i>		<i>Timberline Contracting</i>	<i>OS 2120.1</i>	<i>FS3032.14</i>	<i>FS3032.14</i>	<i>Support</i>	<i>Support OS 2120.1</i>	<i>The Huntly mine subsidence has been inappropriately modelled and mapped, and apply to properties that are not at risk.</i>	<i>Mine Subsidence</i>

Sub no.	Point no.	Name	Organisation	On Behalf Of	Support/ Oppose	Decision Sought	Reason	Provision No.	Primary Plan Section	Secondary Plan Section
2145	2145.1	Sushil Kumar			Oppose	Amend Map 20.2 Huntly East so that the Mine Subsidence Risk Area is not added at 35 Russell Road, Huntly.	Submitter concerned that subsidence will affect value of property, and questions whether the government will pay lost value of the property. Submitter has not felt sudden movements or been affected by subsidence hazard for past ten years.	Map 20.2 – Huntly East	Maps – Mine Subsidence Risk Area	
3032	<i>Renee Laker on behalf of Timberline Contracting</i>		<i>Timberline Contracting</i>	<i>OS 2145.1</i>	<i>FS3032.20</i>	<i>FS3032.20</i>	<i>Support</i>	<i>Support OS 2145.1</i>	<i>The Huntly mine subsidence has been inappropriately modelled and mapped, and apply to properties that are not at risk.</i>	<i>Mine Subsidence</i>
2177	2177.1	Dennis Warrick Young			Support	Amend Map 20.2 Huntly East the Mine Subsidence Risk Area on: 44 Rosser Street, Huntly; 3, 5, 7, 9, 11, 13 Vincent Aspley Place; and 5 Willoughby Place.	Submitter owns land at these addresses.	Map 20.2 Huntly East	Maps- Mine Subsidence Risk Area	

Sub no.	Point no.	Name	Organisation	On Behalf Of	Support/ Oppose	Decision Sought	Reason	Provision No.	Primary Plan Section	Secondary Plan Section
3032	<i>Renee Laker on behalf of Timberline Contracting</i>		<i>Timberline Contracting</i>	<i>OS 2177.1</i>	<i>FS3032.26</i>	<i>FS3032.26</i>	<i>Support</i>	<i>Support OS 2177.1</i>	<i>The Huntly mine subsidence has been inappropriately modelled and mapped, and applies to properties that are not at risk.</i>	<i>Mine Subsidence</i>

General Concerns

Sub no.	Point no.	Name	Organisation	On Behalf Of	Support/ Oppose	Decision Sought	Reason	Provision No.	Primary Plan Section	Secondary Plan Section
2189	2189.1	David Whyte		Huntly Community Board	Oppose	Amend section 15.11 Mine Subsidence Risk Area Overlay. Reduce overlay of subsidence risk modelling to align with the boundaries already identified by the Huntly Subsidence Zone. There is no need to expand this zone as is proposed.	There is a better way to mitigate hazards produced by the now closed mine. The 2018 report used as the rationale for the change is not in line with other reports expert knowledge within the community. If the mine was still in operation, the risks for subsidence inside the zone would be the same as that outside the zone. This is backed up by expert reports. Local knowledge indicates that the mine was closer to the surface (less than 100m depth) compared to other mine workings and therefore probability of subsidence outside the zone is low. The mine system must almost be fully flooded. Trapped gas does not equate to subsidence risk. Entrapped gas is not cause to expand the subsidence area. Concrete data cannot be determined from probabilities and science carries a level of uncertainty. There are negative impacts of extending the zone, and the zone extension will have real world consequences for Huntly, lowering land values.	15.11	15.11	

Sub no.	Point no.	Name	Organisation	On Behalf Of	Support/ Oppose	Decision Sought	Reason	Provision No.	Primary Plan Section	Secondary Plan Section
3019	Blair Everett			OS 2189.1	FS3019.3	FS3019.3	Support	Support OS 2189.1	I support Huntly Community Board - Huntly subsidence zone should not be expanded like the proposed plan. The modelling system has put this zone right through the middle of our property. This zone will have a really negative impact on Huntly as a community, with families not being able to afford insurance and insurance companies not insuring properties in Huntly. This will lead to urgent sales.	Mine Subsidence

Sub no.	Point no.	Name	Organisation	On Behalf Of	Support/ Oppose	Decision Sought	Reason	Provision No.	Primary Plan Section	Secondary Plan Section
3020	<i>Chris Dawson for Bloxam Burnett and Oliver on behalf of Shand Properties Limited</i>	<i>Bloxam Burnett and Oliver</i>	<i>Shand Properties Limited</i>	<i>OS 2189.1</i>	<i>FS3020.23</i>	<i>FS3020.23</i>	<i>Neutral</i>	<i>Neutral OS 2189.1</i>	<i>15.11 Provided Council are able to justify the change in area/boundary location of the Mine Subsidence Risk Area Overlay Shand Properties Limited does not consider that any change is necessary to the area as notified.</i>	<i>Mine Subsidence</i>
3032	<i>Renee Laker on behalf of Timberline Contracting</i>		<i>Timberline Contracting</i>	<i>OS 2189.1</i>	<i>FS3032.36</i>	<i>FS3032.36</i>	<i>Support</i>	<i>Support OS 2189.1</i>	<i>The Huntly mine subsidence has been inappropriately modelled and mapped, and applies to properties that are not at risk including 203 Hakanoa Street, Huntly.</i>	<i>Mine Subsidence</i>