Exhibit No. RT-1CT
Docket UE-170717
Witness: Rob Thomas

BEFORE THE WASHINGTON
UTILITIES AND TRANSPORTATION COMMISSION

In the Matter of PACIFIC POWER & LIGHT COMPANY, 2016 Power Cost Adjustment Mechanism	Docket UE-170717

PACIFIC POWER & LIGHT COMPANY

REDACTED REBUTTAL TESTIMONY OF ROB THOMAS

March 2018

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ATTACHED EXHIBIT

Exhibit No. RT-2C: Golder Engineering Review

Q. Please state your name, business address, your employer, and your position within that organization.

A. My name is Rob Thomas and I was formerly employed as the Underground Coal Practice Leader for Golder Associates; a global engineering consultancy with over 6,500 employees. I am currently a Principal Engineer and the CEO for the RDP Consulting Group (trading as Strata2). My current business address is Suite 4, 36 Kalaroo Road, Redhead, New South Wales, 2290, Australia.

Q. On whose behalf are you testifying?

A. I am testifying on behalf of Pacific Power & Light Company (Pacific Power or Company), a division of PacifiCorp.

QUALIFICATIONS

Q. Briefly describe your educational and professional background.

A. I have a Bachelor of Science in Geology from Liverpool University in the United Kingdom (U.K.), and a PhD in coal mine rock mechanics from Nottingham University, also in the U.K. I have nearly 30 years' experience in the underground coal mining industry, with particular experience in the fields of ground support, mine design, pillar design, and longwall geomechanics. I have provided geotechnical advice to major coal mining companies throughout Australia, New Zealand, the U.K., Europe, and the United States (U.S.).

PURPOSE OF TESTIMONY

Q. What is the purpose of your testimony in this proceeding?

A. The purpose of my testimony is to address whether or not (i) it was an appropriate geotechnical decision to use the Joy longwall in the western area of the mine; (ii) the

ground conditions in longwall 14th Right were adequately addressed before the commencement of longwall production in this panel; (iii) the appropriate actions were taken by the mine when the ground conditions in 14th Right started to deteriorate; and (iv) the appropriate ground control actions were taken when it became no longer possible to retreat the longwall through the deteriorating ground conditions.

JOY LONGWALL

Q. Is longwall mining in the D41 Seam in Bridger Mine predisposed to excessive and unmanageable ground control problems?

A. It is understood that prior to this event, longwall mining in the D41 Seam at Bridger Mine was successfully undertaken for a period of around nine years without any ground control incidents of this scale. Moreover, it is understood that this was achieved primarily as a result of the use of fit-for-purpose longwall equipment, which critically allowed the mine to sit the longwall shields on the hard sandstone unit located immediately below the seam, and not therefore cut into or disturb the underlying weak unit of claystone.

Q. Was it a prudent decision to use the Joy longwall in the western area of the mine?

A. Yes. The longwall specifications indicate that it was; the main points being that the floor pressure, shield capacity, tip-to-face distance, working range, and the general mechanical health of the supports were either comparable or superior to that achieved with the DBT longwall. Further to this, and remembering that the seven foot minimum working range of the Joy longwall exceeds the eight foot minimum coal seam thickness originally anticipated in 14th Right, the available information assessed

as part of this investigation indicates that there were no significant changes in the geotechnical environment that could have otherwise precluded the effective utilization of the Joy longwall in this area of the mine.

Q. Did the Company undertake an appropriate level of due-diligence in arriving at the conclusion that the Joy longwall was appropriate for the anticipated ground conditions in the western area of the mine?

A. Yes. The information assessed as part of this investigation suggests that the main variable to be considered in this regard was the general reduction the seam thickness anticipated in the western area of the mine; all other variables, including the strength of the lower and main roof, the strength of the floor, floor rolls, the depth of overburden, etc., were comparable to that encountered previously and mined successfully in the eastern area of the mine. Moreover, this variable was identified well in advance of the commencement of longwall production in this panel and was the primary reason the decision was made to use a different set of longwall equipment that was more appropriate in a thinner seam section. This said, the key benefits associated with this decision included not only the ability to limit the amount of rock cut on the face and in doing so, the amount of ash delivered to the power plant, but also the ability to limit the likelihood that for whatever reason the longwall would have to mine out of seam and into the weak claystone known to exist in the floor.

Q. Is thin seam longwall mining, by virtue of the increasing tendency for the longwall equipment to mine out of seam, predisposed to ground control problems and unproductive mining?

A. No. Thin seam longwall mining is not predisposed to ground control problems and in

fact it could be argued that as a result of the increased speed of retreat, the increased stiffness of the coal face and the shields, and the increased ability of the gob[1] to support the overburden load, thin seam longwalls are less likely to experience ground control problems. Moreover, it is also of note that currently there are several examples of very productive thin seam longwalls that produce well over four million tons per annum.

Q. Were the ground conditions adequately assessed prior to the commencement of longwall production in 14th Right?

A. Yes. A geological report was completed prior to the extraction of longwall 14th Right and critically, this report did highlight a reducing seam thickness, the potential for seam rolls, the potential for water-make in the roof, the potential for weak channel margin deposits and a weak claystone floor. Further to this however, none of the anticipated ground conditions suggested that mining in 14th Right was not a feasible option with the thin seam Joy longwall.

Q. Were the encountered geology and the associated ground conditions foreseeable?

A. No. Prior to the extraction of 14th Right, there was no precedent at the mine that would otherwise have indicated that such a significant reduction in seam thickness could within reason, coincide with a thinning of the hard sandstone band located in the immediate floor and such a significant seam roll.

Q. Was the significant reduction in seam thickness related to the weak claystone floor?

A. No, the reduction in seam thickness is not related to the weak claystone floor.

[1] The gob refers to the area behind the longwall where the roof caves behind the shields.

Q. Could you provide an explanation for how these are separate geological issues?

A. The claystone was deposited before the coal seam in a different depositional (geologic) setting. Also, it is understood that the variable thickness of the coal seam is related to variations in the depositional environment which persisted at the time the coal was being laid down.

Q. Accepting that the key issue here is the coincidence of a thin seam with several geotechnical anomalies; namely a significant three dimensional seam roll set against a background of very weak roof and floor material, is there any known precedent which the mine site could have drawn upon to aid the development of a proactive management strategy and set of controls prior to mining?

A. Longwall mining in such weak roof and floor geology is extremely rare and as such, there is very little precedent that the mine site could have utilized as part of a proactive management strategy.

Q. On Page 29, lines 9–19 of his testimony, Boise witness Mr. Brad Mullins describes the geological controls at the mine and compares them to one other mine in Colorado. Were the geological controls used at the mine prior to the incident consistent with industry practice at other mines in the western United States?

A. The geological controls employed in the mine prior to the incident were consistent with industry practice in other mines in the western United States. With specific regard to the anticipated and encountered geological environment, the mine had (i) undertaken a detailed exploration program to better understand the strength of the roof and floor rocks, and the thickness of the coal seam and (ii) on the basis of this

information, the mine determined that the Joy longwall was better suited to the anticipated ground conditions than the DBT longwall and had identified the significance of the weak floor prior to mining.

Q. Could you explain the geological controls that are common industry practice in the United States?

A. The standard geological controls used by mines in the United States are the ground control and roof control procedures as required by the Mining Safety and Health Administration (MSHA). These procedures were in place at the Bridger Mine. The geological difficulties that were encountered in the mine were unique, and in this regard, it is of note that MSHA and the National Institute for Occupational Safety and Health (NIOSH) give very little guidance on both the prediction and management of these unique conditions.

Q. Did the mine react to the change in geology in an appropriate manner?

A. Yes. Within the context of accepted practice in the U.S. underground coal industry, the mine did react in an appropriate manner both in the weeks and shifts leading up to the face becoming trapped; e.g. several comments are made with regard to the thinning seam and the shearer operators spotting the face shields and attempting to cut above the hard sandstone layer located in the immediate floor.

Q. When the face was stopped, did the mine react to the deteriorating ground conditions in an appropriate manner?

A. Yes. The mine employed both “industry tried and tested” and state-of-the-art technology in an attempt to control the deteriorating ground conditions. Other options were disregarded on the basis of both personal safety and financial risk.

Moreover, the fact that the recovery efforts extended over a period of nine months suggests a significant level of diligence and persistence from the mine site.

Q. Did you have an opportunity to visit the mine in February of 2016?

A. Yes, I did visit the mine in February of 2016. I subsequently sent a report reviewing the ground control conditions used during the attempted recovery of the 14th Right Longwall Panel. This report is attached as Confidential Exhibit RT-2C to my testimony.

Q. [redacted]

A. [redacted][2]

CONCLUSION

Q. What is your conclusion of the efforts taken by the Company with respect to the Joy longwall?

A. For the reasons discussed previously, I can conclude that (i) the decision to use the Joy longwall in the western area of the mine was appropriate given the anticipated reduction in seam thickness and the absence of any other known geotechnical anomalies that could be considered atypical for the Bridger underground mine; (ii) the ground conditions in longwall 14th Right were adequately addressed prior to the commencement of longwall production in this panel; of particular note being the

[2] Exhibit RT-2C at page 3.

completion of a detailed geology report; (iii) given the absence of any relevant precedent, a number of actions were taken by the mine site when the ground conditions started to change–in particular, the reported attempts to mine the longwall back up on to the hard sandstone floor; and (iv) both "industry tried and tested" and state-of-the-art technology were used to help stabilize the roof and floor when it became apparent that the longwall could not retreat past the deteriorating ground conditions.

Q. Does this conclude your rebuttal testimony?

A. Yes.