

Rocky Mountain Power
Docket No. 13-035-184
Witness: Natalie L. Hocken

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF UTAH

ROCKY MOUNTAIN POWER

Direct Testimony of Natalie L. Hocken

Main Grid Transmission

January 2014

1 **Q. Please state your name, business address and present position with**
2 **PacifiCorp dba Rocky Mountain Power (“the Company”).**

3 A. My name is Natalie L. Hocken. My business address is 825 NE Multnomah
4 Street, Suite 1600, Portland, Oregon 97232. I am Senior Vice President of
5 Transmission and System Operations for PacifiCorp.

6 **Qualifications**

7 **Q. Please describe your education and business experience.**

8 A. I have a law degree from the University of Oregon and am a graduate of the
9 Willamette University Atkinson Graduate School of Management with a
10 certificate in Utility Management. My experience spans over 19 years in the
11 energy industry. Prior to joining PacifiCorp in 2002, I was an energy attorney
12 specializing in federal and state regulatory and energy matters. I have held
13 positions at PacifiCorp of vice president and general counsel of Pacific Power,
14 assistant general counsel and senior counsel.

15 **Q. What are your responsibilities as Senior Vice President of Transmission and**
16 **System Operations?**

17 A. As Senior Vice President of Transmission and System Operations, I am
18 responsible for management of transmission services, transmission planning and
19 system operations for PacifiCorp’s two balancing authority areas. I am
20 responsible for activities required to support PacifiCorp’s existing and future bulk
21 transmission system and to ensure a safe and reliable transmission system that
22 provides economic service to our customers, including delivery of the Company’s
23 long-term Energy Gateway Transmission Expansion Plan (“Energy Gateway”).

24 **Purpose and Summary of Testimony**

25 **Q. What is the purpose of your testimony?**

26 A. The purpose of my testimony is to support the major test year costs associated
27 with capital investments in the Company's transmission system. The capital
28 investments that will be placed into service during the test year in this case that
29 represent individual project investments greater than \$10.0 million include the
30 following:

- 31 • the costs to plan and build the Sigurd-to-Red Butte 345 kilovolt transmission
32 project ("Sigurd-to-Red Butte Project"),
- 33 • the costs to plan and build the Carbon Plant replacement,
- 34 • the costs to plan and build the 230 kilovolt Standpipe substation,
- 35 • the phase one costs to plan and build the Whetstone 230/115 kilovolt
36 substation,
- 37 • the costs to plan and upgrade the Union Gap 230 kilovolt transmission
38 substation, and
- 39 • the costs to plan and build the Lakeside 2 generating plant transmission
40 service project.

41 My testimony will provide evidence showing that the Company was prudent in
42 managing these costs, and that these investments will be used and useful during
43 the test year and beneficial to our retail customers.

44 **Q. Please summarize your testimony.**

45 A. First, I will provide a detailed description of the Sigurd-to-Red Butte Project,
46 including associated costs to plan and build. I will show that, given existing

47 limited capacity on the transmission system, the Sigurd-to-Red Butte Project is
48 needed to support both short- and long-term energy demands. The project will
49 strengthen the overall reliability of the existing transmission system, and the
50 project is necessary to maintain the Company's compliance with mandated North
51 American Electric Reliability Corporation ("NERC") and Western Electricity
52 Coordinating Council ("WECC") reliability and performance standards. Our
53 customers' demand for energy continues to increase and the need for the Sigurd-
54 to-Red Butte Project at this time, which was demonstrated during the Certificate
55 of Public Convenience and Necessity proceeding in Docket No. 12-035-97, has
56 not changed.

57 Next, I will describe the completion of construction and placement into
58 service of the Sigurd-to-Red Butte Project, including associated costs. I will show
59 that the Company prudently managed the costs of the Sigurd-to-Red Butte Project
60 by ensuring that it was built in an efficient and cost effective manner for the
61 benefit of our customers.

62 Finally, I will discuss the other transmission capital investments included
63 in the test year, and will demonstrate that these investments, as well as the Sigurd-
64 to-Red Butte Project, will be used and useful for our customers.

65 **Q. What are the projected costs associated with transmission investments**
66 **included in rate base in this proceeding?**

67 A. The projected costs associated with transmission investments included in rate base
68 in this proceeding total \$771.1 million for the period July 1, 2013, through June
69 30, 2015, as shown below:

Transmission Projects	Investment
Sigurd-to-Red Butte Project	363.7
Carbon Plant replacement project	46.5
Standpipe Substation construction project	26.9
Union Gap transmission substation project	19.1
Whetstone Substation project	17.7
Lake Side 2 generating plant transmission service project	11.8
Non-Main Grid Transmission Projects	194.7
Projects less than \$10m / close out of previously approved projects	90.7
	<u>771.1</u>

70 Company witness Mr. Douglas N. Bennion addresses the non-main grid
71 transmission projects in his direct testimony. Also refer to Mr. Steven R.
72 McDougal’s plant additions Exhibit RMP____(SRM-3).

73 **Sigurd-to-Red Butte Project**

74 Description

75 **Q. Please describe the Sigurd-to-Red Butte Project.**

76 A. The Project is one component of the Company’s Energy Gateway transmission
77 plan, and consists of a single-circuit 345 kilovolt transmission line originating
78 from the Sigurd substation in Sevier County located approximately six miles
79 northeast of the town of Richfield, Utah extending southward approximately 170
80 miles to the Red Butte substation in Washington County, Utah west of State
81 Route 18 and near Central, Utah, as more particularly depicted in the attached
82 map, Exhibit RMP____(NLH-1).

83 **Q. Please provide the details of the project cost.**

84 A. The total cost of the project is \$363.73 million, comprised of the following:

SIGURD-RED BUTTE PROJECT		
Summary of Accounting Entries by Major Cost Category		
Estimated Costs to be Booked in June, 2015		
ROW	(All Rights of Way Obtained, Including Labor)	\$ 16,829,497
EPC	(EPC Contracts)	\$ 252,950,467
Property	(Land, Property Tax)	\$ 5,965,783
Permitting	(EIS, POD, CUP's, CPCN, Community Outreach)	\$ 19,432,745
Engineering	(Engineering Support during Permitting and Construction, EPC RFP)	\$ 20,762,716
PMO	(Project Management, Project Controls, Vegetation Management, Inspection)	\$ 39,080,359
Non-EPC	(Communications Equipment and Internal Construction Labor)	\$ 8,587,173
	Estimated Spend Through June 30, 2015	\$ 363,608,740
	Estimated Project Completion Percentage	97%

85 **Q. What is the current status of the Sigurd-to-Red Butte Project and the**
86 **expected in-service date?**

87 A. Construction on the Sigurd-to-Red Butte Project began in May 2013. As of
88 December 2013, construction access roads are in place for approximately 48 miles
89 of the transmission line path. Over 321 foundations have been completed
90 representing approximately 40 percent of the total foundations, and 254 of the
91 single-circuit 345 kilovolt lattice towers have been erected representing
92 approximately 32 percent of the total structures. The installation of ground grid
93 and major equipment foundations began in the first quarter of 2014, with
94 equipment scheduled for delivery beginning in the second quarter of 2014. The
95 timing of these activities supports the projected June 2015 in-service date. This
96 investment is being included in the test period for one month. Exhibit

97 RMP___(NLH-2), attached hereto, contains recent photos of construction
98 progress on the Sigurd-to-Red Butte Project.

99 **Q. What actions have been taken to ensure the Sigurd-to-Red Butte Project will**
100 **be placed in service on time and at its current cost forecast?**

101 A. The Company has in place a turnkey engineer, procure, and construct contract for
102 the Sigurd-to-Red Butte Project similar to what it has done on prior segments of
103 Energy Gateway. This approach establishes a lump sum cost for design and
104 construction. The contract establishes monitoring and reporting controls to which
105 the contractor must adhere in completing the Sigurd-to-Red Butte Project. These
106 include providing monthly progress reports on engineering, procurement, status of
107 construction to schedule, risks identified and cost expenditures. If the contractor
108 feels it necessary to request changes to the Sigurd-to-Red Butte Project that would
109 affect the contract schedule or cost, the Company requires a review process for
110 the requested change. The contractor is not allowed to proceed with the requested
111 change until the Company approves the change.

112 Project Need and Justification

113 **Q. Was the Sigurd-to-Red Butte Project included in the Company's most recent**
114 **IRP?**

115 A. Yes. The Company's 2013 IRP includes the Sigurd-to-Red Butte Project as part
116 of the modeled transmission topology for the purpose of selecting the Company's
117 preferred portfolio of future supply-side and demand-side resources. The 2013
118 IRP Action Plan, Chapter 9, consists of a number of actions needed to deliver the

119 plan, one of which is to “Complete project construction per plan for the Sigurd-to-
120 Red Butte 345 kilovolt transmission line.”

121 **Q. Has the Sigurd-to-Red Butte Project been included in previous IRPs?**

122 A. Yes. The 2008 Integrated Resource Plan (“IRP”), updated March 31, 2010, and
123 2008 IRP Update Errata dated June 16, 2010, include the Project as part of the
124 modeled transmission topology for the purpose of selecting the Company’s
125 preferred portfolio of future supply-side and demand-side resources. The 2008
126 IRP describes what the Company calls the “Energy Gateway Transmission
127 Expansion.” (2008 IRP, at pages 60-66). The Sigurd-to-Red Butte Transmission
128 Project is an integral part of the Energy Gateway Transmission Expansion.
129 Energy Gateway is designed to use “a ‘hub and spoke’ concept to most efficiently
130 integrate transmission lines and collection points with resources and loads centers
131 aimed at serving the Company’s customers while keeping in sight Regional and
132 Sub Regional needs.” (2008 IRP, at page 61). The “2008 IRP Action Plan
133 Update” consisted of 21 Action Items, one of which was to “Permit and construct
134 a 345 kilovolt line between Sigurd and Red Butte.” (2008 IRP, Table 6.1, at pages
135 56 through 66; the Sigurd-to-Red Butte project is identified as item 12 on page
136 64). The Sigurd-to-Red Butte Project was evaluated for cost-effectiveness from an
137 integrated system benefits perspective. Further the Project was incorporated as
138 part of a transmission expansion option included in the 2007 IRP capacity
139 expansion optimization model. This analysis helped support the decision to
140 include the Project as part of the Company’s preferred portfolio. (2007 IRP, page
141 231).

142 **Q. Were alternatives to the Sigurd-to-Red Butte Project considered?**

143 A. Yes. Long-term alternatives to constructing a new transmission line are limited;
144 however, alternatives have been assessed by the Company during the IRP process.
145 Alternatives considered included: (1) electric load and demand-side management
146 and energy conservation as part of the Company's IRP; (2) the installation of new
147 generation facilities; (3) additional capacity to existing transmission lines and
148 alternative transmission technologies. As a result of the resource portfolio
149 modeling conducted for the 2011 IRP, the Company concluded that none of these
150 alternatives met the Company's needs and long-term requirements, and additional
151 transmission transfer capability in Utah presented the lowest overall cost and was
152 the best alternative to meet our customers' demand for electricity.

153 **Q. Has the Sigurd-to-Red Butte Project's purpose and need been established
154 and justified in Utah?**

155 A. Yes. The Sigurd-to-Red Butte Project's purpose and need has been clearly
156 established and justified through previous regulatory proceedings conducted in
157 Utah. Detailed and credible evidence justifying the Sigurd-to-Red Butte Project
158 was presented by the Company through its efforts to successfully obtain a
159 Certificate of Public Convenience and Necessity ("CPCN").

160 **Q. Did this Commission find that the Sigurd-to-Red Butte Project was needed,
161 justified, and necessary in the interest of the public?**

162 A. Yes. The Commission granted a CPCN for the transmission line and related
163 facilities in its Report and Order issued March 15, 2013, in Docket No. 12-035-
164 97.

165 **Q. When placed in service will the Sigurd-to-Red Butte Project be used and**
166 **useful?**

167 A. Yes. When a transmission project is energized and placed into service, all
168 elements of the project are part of the interconnected system as a whole. These
169 elements are fully used and useful in providing transmission service on the
170 system. Transmission infrastructure additions inherently have some ability to
171 provide future capacity after being placed in service. This results from using
172 industry standard voltages and design criteria, and reliability requirements
173 necessary for system operation and maintenance.

174 **Q. You indicate that when a new transmission line is added, it becomes a part of**
175 **the integrated system as a whole. Please explain.**

176 A. Electrical transmission systems are made up of numerous electrical elements,
177 including lines, substations, generation plants, and control systems that operate as
178 a fully integrated network. All elements of the network are electrically dependent
179 upon each other for the purpose of producing and transmitting energy
180 instantaneously to customers on demand. New transmission capacity, when added
181 to an existing system, is installed in increments based on standard system
182 voltages, line conductors, equipment, and apparatus that are available in the utility
183 industry. Electrical power flows across the entire system, and on any individual
184 line or station, are a function of the physics of the entire interconnected network
185 and the level of generation and load present at any given instant in time. As a
186 result, when a new line or substation is added, it immediately carries its full share
187 of the total energy being transmitted by the system. Whenever a new line or

188 substation is added to the transmission system, electrical capacity on the network
189 is increased. The incremental capacity increase added to the network is based on
190 both the new facility's capacity and its electrical interaction with all other
191 facilities to which it is interconnected. While the Project provides benefits to the
192 local areas wherein it is constructed, it also provides benefits to the wider
193 interconnected transmission system.

194 Prudence of Sigurd-to-Red Butte Project Delivery

195 **Q. How did the Company ensure that the costs expended to engineer, design,**
196 **site, and build the Sigurd-to-Red Butte Project were the most cost effective**
197 **for its customers?**

198 A. From a planning perspective, the Company applied prudent industry standards to
199 identify the best transmission route and substation locations in order to balance
200 engineering requirements, environmental impacts, project costs, and impacts to
201 communities during the siting process, while ensuring that the siting criteria
202 requirements were met. This included the completion of project siting and routing
203 feasibility studies by the Company between 2005 to 2008 and the completion of
204 the National Environmental Policy Act ("NEPA") Environmental Impact
205 Statement ("EIS") process between December 2008 and December 2012,
206 resulting in issuance of Records of Decision by the United States Forest Service
207 and the Bureau of Land Management granting PacifiCorp right-of-way across
208 public lands. This process determined the final preferred transmission line route
209 and substation locations, which were then incorporated into the Company's
210 competitive bidding process for construction.

211 **Q. Please describe the Company’s competitive bidding process.**

212 A. The Company initiated a competitive bidding process to receive blind-sealed bids
213 for the project to be delivered on a turnkey, fixed price, guaranteed completion
214 date basis using an engineer, procure, and construct (“EPC”) contract. The
215 Company utilized this process for the substation build part of the project and
216 separately for the transmission line build part of the project. The competitive bid
217 process resulted in the Company obtaining the lowest risk evaluated cost for
218 delivery of the Sigurd-to-Red Butte Project.

219 **Q. Please describe the timing and competitive bid process for the substation
220 build part of the project.**

221 A. The competitive bid process for the substation build part of the project began in
222 May 2011. Six bid responses were received in September 2011. Two addenda
223 were subsequently issued and final bids were received in June 2012. After
224 extensive evaluations of bidder proposals and review of exceptions to work scope
225 and base terms and conditions from each bid proposal, the most qualified bidder
226 was identified. Final negotiations with the qualified bidder began in August 2012
227 with the Company issuing the final contract in September 2012.

228 **Q. Please describe the timing and competitive bid process for the transmission
229 line build part of the project.**

230 A. The competitive bidding process began in June 2011 and provided two separate
231 blind-sealed bidding opportunities. All bid responses were due in December 2011
232 and again in August 2012 after additional information was provided to bidders
233 allowing a refinement of previously submitted design solutions and terms and

234 conditions, including price. Five qualified bids were received in August 2012.
235 After extensive evaluations of bidder proposals and review of exceptions to work
236 scope and base terms and conditions from each bid proposal, the final most
237 qualified bidder was identified. Final negotiations with the most qualified bidder
238 were held in November 2012. That same month, the Company awarded the
239 contract and issued a notice of intent, with a notice to proceed issued in March
240 2013.

241 **Q. With respect to the construction of the Sigurd-to-Red Butte Project, how did**
242 **the Company ensure that the costs to build the project were controlled for**
243 **the benefit of customers?**

244 A. EPC contracts are regarded in the industry as a prudent approach to control costs
245 and manage design, procurement, and construction risks. EPC contracts provide
246 schedule and cost certainty to the benefit of customers and, where possible, cap
247 potential cost escalations upon the occurrence of defined risks. EPC contracts also
248 ensure more timely delivery of needed testing, commissioning, and in-service
249 dates to support system needs and help ensure ongoing transmission system
250 reliability.

251 The fixed-price EPC contracts for the Sigurd-to-Red Butte Project have
252 strong provisions to control cost and schedule variances. Where cost and schedule
253 variances were not included in the fixed price for certain contingent aspects of the
254 work scope, these items were identified as risk items and a contingent capped
255 price and schedule allowance were agreed to before contract execution.

256 Contingent risk items were limited to defined occurrences such as weather delays
257 and environmental impacts.

258 Benefits of the Project

259 **Q. How will the Sigurd-to-Red Butte Project benefit the Company's customers?**

260 A. The Project is necessary to provide safe and reliable service to customers and to
261 meet expected and forecasted customer energy demand. In addition, the Sigurd-
262 to-Red Butte Project is a key component required for executing the Company's
263 current and future integrated resource plans, which require reliable transport of
264 designated network resources to network loads consistent with PacifiCorp's
265 federal Open Access Transmission Tariff ("OATT"). This is necessary to ensure
266 an adequate, reliable, and low cost supply of energy is available for the benefit of
267 our customers. Having adequate long-term transmission system capacity is
268 fundamental in developing and executing those integrated plans and meeting our
269 OATT obligations.

270 **Q. What specific reliability standards and criteria require the Project and its in-**
271 **service date?**

272 A. PacifiCorp plans, designs, and operates its transmission system to meet NERC
273 reliability standards for Bulk Electric Systems and WECC Regional standards and
274 criteria. The NERC reliability standards are federal law as set forth in 18 CFR
275 Part 40 (Mandatory Reliability Standards for Bulk-Power Systems). The WECC
276 standards and criteria are deemed necessary for the WECC Region to meet or
277 exceed NERC reliability standards. There are currently more than 100 approved
278 NERC standards with which the Company must comply. The Project and its

279 respective in-service date timing are required to maintain the Company's
280 compliance with these standards.

281 **Carbon Plant Replacement Project**

282 **Q. Please describe the additional plant investments for the Carbon Plant**
283 **replacement project.**

284 A. The plant investments associated with the Carbon Plant replacement project
285 consist of installation of capacitor banks and installation of a static var
286 compensator at the Mathington Substation; the upgrade of communications and
287 the modifying of the protection and control equipment at multiple locations; and
288 the installation of one substation control building, one phase shifting transformer,
289 the relocation of a series reactor from Spanish Fork Substation, six circuit
290 breakers with associated voltage transformers, and switches at the Upalco
291 Substation.

292 Q. Please provide the details of the project cost.

293 A. The total cost of the project is \$46.5 million, comprised of the following:

CARBON PLANT REPLACEMENT PROJECT		
Summary of Estimated Spend by Cost Category		
		Estimated
Labor	(Internal Crews/Construction, Engineering, Project Management, etc.)	\$ 2,332,286
Material	(Equipment)	\$ 7,514,340
	Capacitor Banks	
	Static Var Compensator	
	Phase Shifting Transformer	
	Circuit Breakers	
Purchase Services	(External Crews/Construction)	\$ 27,683,331
Other		\$ 2,708,717
	Land Purchase	
	Right of Way	
	Permitting	
Surcharge & AFUDC		\$ 6,274,849
Total Estimate for Rate Period		\$ 46,513,523

294 Q. Please explain why this additional plant investment is needed.

295 A. The plant investment for the Carbon Plant replacement project is needed because
296 an interconnection customer (PacifiCorp Energy), requested to decommission the
297 existing 172 MW Carbon thermal facility (“Carbon Plant”) located in Carbon
298 County, Utah. The requested completion date for the Project is April 2015. The
299 northeastern to central Utah transmission system consists of the Vernal-Ashley-
300 Upalco-Carbon 138 kilovolt line (owned by PacifiCorp) and the Bonanza-Mona
301 345 kilovolt line (owned by Deseret Generation and Transmission Cooperative).
302 The balance of energy flow between the 138 and 345 kilovolt lines is critical to

303 maintaining the Bonanza West path rating granted by the WECC. With the 2015
304 decommissioning of the Carbon Plant the relay load level for tripping the
305 Bonanza generation unit will be significantly lowered (more than 100 MW) to
306 maintain the path rating when the Sunnyside generation plant (52 MW) is
307 operating. The Sunnyside cogeneration plant is owned by Exelon Corporation and
308 is located near the town of Sunnyside, Utah. For operating conditions with the
309 Sunnyside generation off-line and high Bonanza West flows, the Bonanza West
310 path rating will be reduced by 50 to 100 MW due to high flow on the Upalco-
311 Carbon 138 kilovolt line, and Bonanza unit generation will have to be reduced
312 more than 100 MW. Therefore, installation of the assets described above and
313 included in the Carbon Plant replacement project are critical to maintain
314 transmission system stability and current path ratings after the Carbon Plant is
315 decommissioned.

316 **Standpipe Substation**

317 **Q. Please describe the additional plant investment for the Standpipe Substation**
318 **construction project.**

319 A. The transmission capital investment costs in this proceeding include
320 approximately \$26.9 million for the Standpipe Substation construction project
321 plant that will be placed into service in 2014. This plant investment consists of a
322 new 230 kilovolt substation called Standpipe. The substation will be constructed
323 as a 2-bay breaker and a half bus, with a partial build out of a third bay to connect
324 a future synchronous condenser. Other additions include upgrades at the existing
325 Platte and Latham Substations located near Rawlins, Wyoming, including bus

326 reconfigurations, and a shunt capacitor bank at Latham, and the associated
 327 controls, breakers, and protection. The synchronous condenser and associated
 328 equipment will be placed into service in June of 2016.

329 **Q. Please provide the details of the project cost.**

330 A. The total cost of the project is \$26.9 million, comprised of the following:

STANDPIPE SUBSTATION CONSTRUCTION PROJECT		
Summary of Estimated Spend by Cost Category		
		Estimated \$
Labor	(Internal Crews/Construction, Engineering, Project Management, etc.)	\$ 2,102,129
Material	(Equipment)	\$ 4,990,883
	Breakers & Bus Work at New Standpipe Substation	
	Bus Work at Platte Substation	
	Capacitor Bank at Latham Substation	
Purchase Services	(External Crews/Construction)	\$ 13,688,167
Other		\$ 2,952,806
	Right of Way	
	Surveying	
	Engineering Studies	
	Environmental Studies	
	Employee Expenses	
Surcharge & AFUDC		\$ 3,127,633
Total Estimate for Rate Period		\$ 26,861,618

331 **Q. Please explain why this additional plant investment for the Standpipe**
 332 **Substation project is needed.**

333 A. The plant investment for the Standpipe Substation construction project is needed
 334 because customers in the Platte area of the Wyoming system have been exposed
 335 to excessively high steady state voltages as well as a large number of transient

336 voltage excursions. Reported customer impacts following these high voltage
337 conditions have been significant, and at this time, there are limited operational
338 means of reducing voltage during these conditions. To mitigate system instability
339 resulting from high voltage levels, installation of shunt reactors and capacitors in
340 addition to a synchronous condenser at a new Standpipe substation will provide a
341 means to mitigate these conditions and improve power quality and reliability in
342 the region. Additionally, the installation of a synchronous condenser at Standpipe
343 will increase the reactive support of the transmission system in the region,
344 resulting in better voltage stability and attenuation of voltage swings during
345 system operation.

346 **Union Gap Transmission Substation Upgrade Project**

347 **Q. Please describe the additional plant investment for the Union Gap**
348 **transmission substation upgrade project.**

349 A. The transmission capital investment costs in this proceeding include
350 approximately \$19.0 million for the Union Gap upgrade transmission substation
351 project. This plant investment includes relocating and upgrading the existing 230
352 kilovolt bus into a ring bus including the installation of six new 230 kilovolt
353 breakers and the addition of a new 230/115 kilovolt, 250 Mega Volt Ampere
354 transformer to be placed in service in March of 2015 and will be used and useful
355 in supporting the transmission system. Final completion of the project that will be
356 placed into service in June of 2016 includes a rebuild of the existing 115 kilovolt
357 main transfer bus to a breaker and a half scheme, and fifteen new 115 kilovolt
358 breakers on the 115 kilovolt bus.

359 Q. Please provide the details of the project cost.

360 A. The total cost of the project is \$19.1 million, comprised of the following:

UNION GAP TRANSMISSION SUBSTATION UPGRADE		
Summary of Estimated Spend by Cost Category		
		Estimated \$
Labor	(Internal Crews/Construction, Engineering, Project Management, etc.)	\$ 519,494
Material	(Equipment)	\$ 2,961,114
	230 kV Ring Bus and Breakers	
	230/115 kV Transformer	
Purchase Services	(External Crews/Construction)	\$ 12,467,847
Other		\$ 727,291
	Environmental Studies	
	Permitting	
	Right of Way	
	Labor Expense	
Surcharge & AFUDC		\$ 2,417,983
Total Estimate for Rate Period		\$ 19,093,729

361 Q. Please explain why this additional plant investment for the Union Gap
362 transmission substation upgrade project is needed.

363 A. The plant investment for the Union Gap upgrade transmission substation project
364 is needed to comply with NERC reliability standards. Specifically, the project is
365 necessary to enable compliance with NERC Standard TPL-002 “System
366 Performance Following Loss of a Single Bulk Electric System Element (Category
367 B)” that requires bulk electric system elements, including transmission
368 transformers, to be within thermal limits following the single contingency loss of
369 a transmission system element. An outage of one of the two 230/115 kilovolt

370 transformers results in an overload of the remaining transformer of approximately
371 50 MW which can be maintained for a maximum of four hours. PacifiCorp's 2011
372 West System Assessment for TPL-002 Compliance Requirements notes that for
373 the loss of a Union Gap 230/115 kilovolt transformer in heavy summer loading
374 conditions, overload of the posted four hour emergency limit of the transformer
375 will be experienced by 2016. To correct this system deficiency, the recommended
376 plan of service is to install a third 230/115 kilovolt transformer at Union Gap.

377 **Q. Are there other system limitations that this transmission investment will**
378 **alleviate?**

379 A. Yes. PacifiCorp's 2011 West System Assessment for TPL-003 Compliance
380 Requirements notes nine outages involving 115 kilovolt, 230 kilovolt breaker and
381 bus faults, with stuck breakers and protection systems failures at Union Gap that
382 result in thermal and voltage performance deficiencies. Loss of both 230/115
383 kilovolt transformers results in 30 MW of load being shed (6,000 customers) for
384 the initial outage. This will also result in the remaining transformers at Pomona
385 Heights being overloaded by approximately 150 MW which would require
386 corrective measures to remove the overloads from the transformers. To correct all
387 aforementioned system limitations in a cost effective manner, this plan of service
388 was selected to rebuild the 230 kilovolt and 115 kilovolt buses into a ring bus for
389 the 230 kilovolt bus and breaker and a half configuration for the 115 kilovolt bus
390 which will eliminate the TPL-003 system deficiencies at Union Gap.

391 **Whetstone Substation Construction Project**

392 **Q. Please describe the additional plant investment for the Whetstone Substation**
393 **construction project.**

394 A. The transmission capital investment costs in this proceeding include
395 approximately \$17.7 million for the Whetstone Substation construction project.
396 This plant investment consists of a new substation with one 150/200/250 Mega
397 Volt Ampere, three phase, load tap changer autotransformer, four 115 kilovolt
398 breakers and three 230 kilovolt breakers with associated switches. Other
399 investments include a generator, a control house with a battery system,
400 communication facilities, relay equipment, and a reconfiguration and reconductor
401 of 3.8 miles of 115 kilovolt transmission line from the Scenic substation to the
402 Whetstone substation.

403 Q. Please provide the details of the project cost.

404 A. The total cost of the project is \$17.7 million, comprised of the following:

WHETSTONE SUBSTATION CONSTRUCTION PROJECT		
Summary of Estimated Spend by Cost Category		
		Estimated \$
Labor	(Internal Crews/Construction, Engineering, Project Management, etc.)	\$ 1,305,953
Material	(Equipment)	\$ 3,967,146
	230/115 kV Transformer	
	230 kV breakers	
	115 kV breakers	
	115 kV conductor	
Purchase Services	(External Crews/Construction)	\$ 6,158,504
Other		\$ 2,978,746
	Property/Permitting	
	Misc. labor	
Surcharge & AFUDC		\$ 3,335,923
Total Estimate for		\$ 17,746,272

405 Q. Please explain why this additional plant investment for the Whetstone
406 Substation project is needed.

407 A. This plant investment for the Whetstone Substation construction project is needed
408 because NERC Standard TPL-002 “System Performance Following Loss of a
409 Single Bulk Electric System Element (Category B)” requires bulk electric system
410 elements, including transmission transformers, to be within thermal limits
411 following the single contingency loss of a transmission system element. The loss
412 of one of the Lone Pine 230/115 kilovolt 250 Mega Volt Ampere transformers
413 overloads the other transformer beyond the summer four hour emergency rating

414 and results in a system deficiency under TPL-002. After completing the new
415 substation and reconfiguring the Medford system, the TPL-002 overload for loss
416 of a Lone Pine 230/115 kilovolt transformer will be resolved. The reconductor of
417 Line 74 must be completed to accommodate the loss of line 99 from Lone Pine to
418 Brookhurst prior to Whetstone substation being placed in service.

419 **Lake Side 2 Generating Plant Transmission Service Request Project**

420 **Q. Please describe the additional plant investments for the Lake Side 2**
421 **generating plant transmission service request project.**

422 A. Transmission of energy from the Lake Side 2 generation facility to beyond the
423 Steel Mill substation requires the installation of two new 345 kilovolt breakers
424 and looping in of the Camp Williams - Emery 345 kilovolt line at Spanish Fork
425 substation. A reconductoring of the ten mile Spanish Fork - Tanner 138 kilovolt
426 line and communication fiber to Hale substation is also required. Equipment
427 replacement, control modifications and communications upgrades will be required
428 at the Spanish Fork, Tanner and Hale substations.

429 Q. Please provide the details of the project cost.

430 A. The total cost of the project is \$11.8 million, comprised of the following:

LAKE SIDE 2 GENERATING PLANT TRANSMISSION SERVICE REQUEST		
Summary of Estimated Spend by Cost Category		
		Estimated \$
Labor	(Internal Crews/Construction, Engineering, Project Management, etc.)	\$ 1,839,245
Material	(Equipment)	\$ 3,396,652
	345 kV Breakers	
	138 kV Conductor	
	Communications Equipment	
Purchase Services	(External Crews/Construction)	\$ 4,909,348
Other		\$ 585,414
	Right of way purchase	
	Labor expenses	
Surcharge & AFUDC		\$ 1,035,315
Total Estimate for Rate Period		\$ 11,765,974

431 Q. Please explain why these additional investments for the Lake Side 2
432 generating plant transmission service request project are necessary.

433 A. A transmission customer (PacifiCorp Energy) has requested transmission service
434 to PacifiCorp's transmission network at the Lake Side 2 Generating facility near
435 Vineyard, Utah under PacifiCorp's OATT. Under the OATT, PacifiCorp has
436 completed the necessary studies and identified the additional network facilities
437 necessary to provide transmission service for the Lake Side 2 project. PacifiCorp
438 is required to provide transmission service per the terms and conditions of its
439 OATT.

440 **Conclusion and Recommendation**

441 **Q. What do you recommend?**

442 A. I recommend that the Commission find the Company acted prudently in making
443 the necessary investments and plant additions I have discussed in this testimony
444 and that the Commission issue an order allowing full recovery of these costs.

445 Based on the evidence I have provided, I further recommend that the
446 Commission find the Company has prudently selected the lowest cost project
447 alternatives and managed costs and delivery risks for the transmission projects
448 included within this case, and that the Commission find such projects provide
449 significant benefits to our customers.

450 **Q. Does this conclude your direct testimony?**

451 A. Yes.

Rocky Mountain Power
Exhibit RMP__(NLH-1)
Docket No. 13-035-184
Witness: Natalie L. Hocken

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF UTAH

ROCKY MOUNTAIN POWER

Exhibit Accompanying Direct Testimony of Natalie L. Hocken

Sigurd to Red Butte Project Site Map

January 2014

PROJECT AREA

- PROJECT FEATURES**
- Agency Preferred Route Centerline
- LAND OWNERSHIP**
- Bureau of Land Management
 - Indian Reservation
 - National Park Service
 - Private
 - State of Utah Trust Lands
 - State Park
 - U.S. Forest Service
- GENERAL REFERENCE FEATURES**
- Project Study Area
 - Substation
 - 500KV +/- DC Transmission Line
 - 345KV Transmission Line
 - 230 to 287KV Transmission Line
 - 138 to 161KV Transmission Line
 - Pipeline
 - BLM Field Office Boundary
 - County Boundary
 - Interstate & U.S. Highway
 - State Highway
 - Railroad
 - Lake, Pond, or Reservoir

SOURCES:
 Transportation: Streetmap 50K to 250K, 2008
 POWERmap, powermap.plate.com
 ©2007 Plate, A Division of The McGraw-Hill Companies

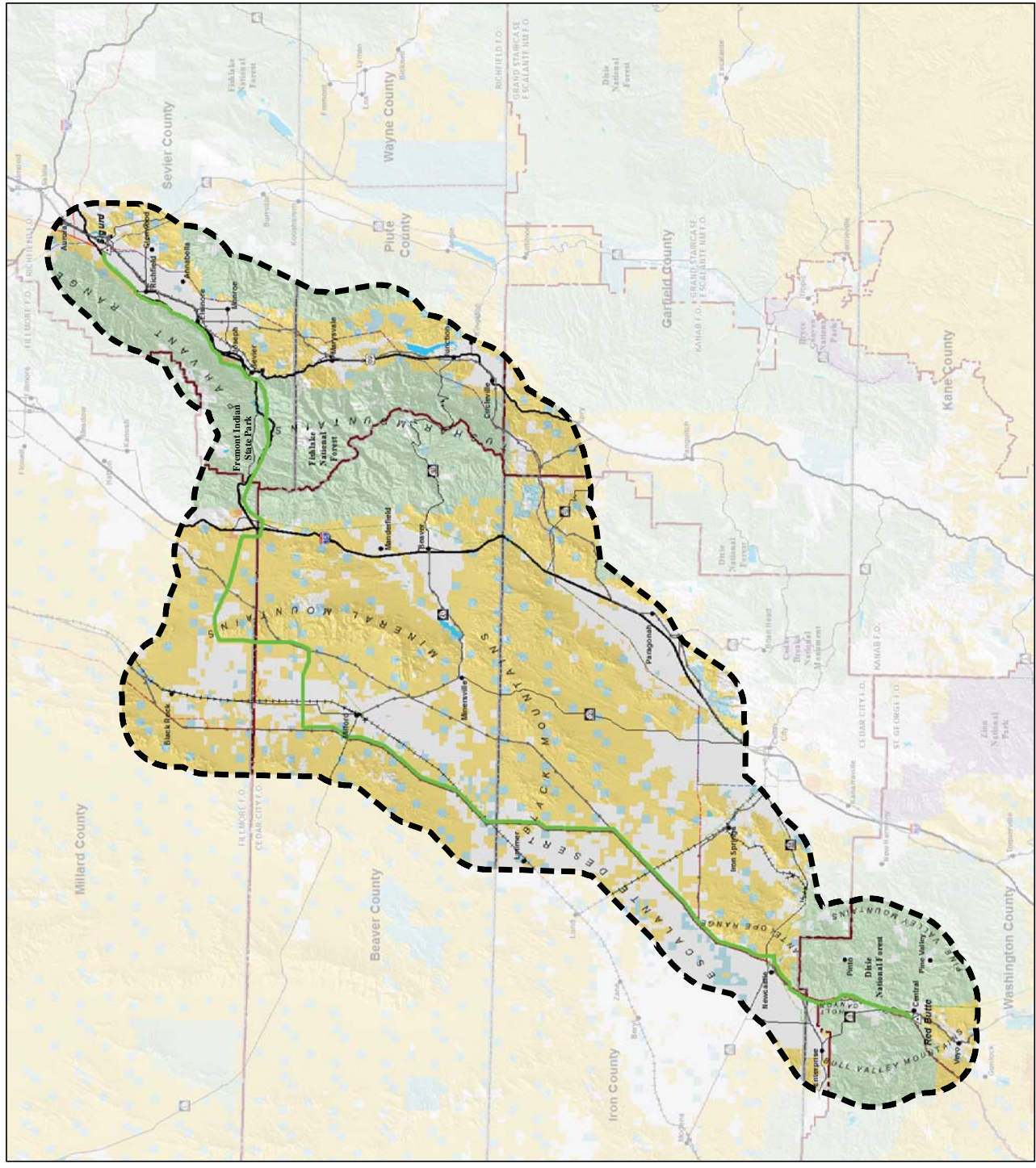


November 2012

SIGURD TO RED BUTTE NO. 2
 345KV TRANSMISSION PROJECT



Rocky Mountain Power, a Division of The McGraw-Hill Companies



Rocky Mountain Power
Exhibit RMP__(NLH-2)
Docket No. 13-035-184
Witness: Natalie L. Hocken

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF UTAH

ROCKY MOUNTAIN POWER

Exhibit Accompanying Direct Testimony of Natalie L. Hocken

Construction photos – Sigurd to Red Butte

January 2014



