



Jim Bridger Plant Heat Rate Improvement Plan
JB_2009_HRIP

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1. Revision History

Version	Status	Author	Reason for Issue	Date
<u>1</u>			<u>Original Submittal</u>	<u>March 31, 2009</u>

2. Revision Control

This document is maintained by the PacifiCorp Energy Asset Management group.

3. Glossary of Terms

- 3.1. Actual Net Heat Rate (Btu/kWh)
Total actual heat input in Btu’s divided by actual net generation.
- 3.2. As-built Net Heat Rate (Btu/kWh)
Total guaranteed heat input, from the design heat balances in Btu’s divided by the guaranteed net generation, corrected for changes in equipment from design. This is the baseline number for the plant personnel when they make their annual reconciliation.
- 3.3. British thermal unit (Btu)
British thermal unit is defined as the amount of heat required to raise the temperature of one pound of water by one degree Fahrenheit.
- 3.4. Gross Heat Rate (Btu/kWh)
Total actual heat input in Btu’s divided by actual gross generation.
- 3.5. Net Generation (kWh)
Gross generation minus auxiliary or station usage
- 3.6. Planned Net Heat Rate (Btu/kWh)
Total budgeted heat input in Btu’s divided by the budgeted net generation. This number is the annual goal for the plant personnel to achieve.

4. Overall Plan and Objectives

- 4.1. Unit 1- Goals for 10-year plan
Figure 1, in the appendix, shows the ten-year heat rate plan for Jim Bridger unit 1. The dip in the Planned Net Heat Rate in the year 2011 is due to the work that is scheduled to take place during the planned outage in 2010 (see section 7).
- 4.2. Unit 2 - Goals for 10-year Plan
Figure 2, in the appendix, shows the ten-year heat rate plan for Jim Bridger unit 2. The dip in the Planned Net Heat Rate in the year 2014 is

due to the work that is scheduled to take place during the planned outage in 2013 (see section 7).

4.3. Unit 3 - Goals for 10-year Plan

Figure 3, in the appendix, shows the ten-year heat rate plan for Jim Bridger unit 3. The dip in the Planned Net Heat Rate in the year 2012 is due to the work that is scheduled to take place during the planned outage in 2011 (see section 7).

4.4. Unit 4 - Goals for 10-year Plan

Figure 4, in the appendix, shows the ten-year heat rate plan for Jim Bridger unit 4. The dip in the Planned Net Heat Rate in the years 2013 is due to the work that is scheduled to take place during the planned outage in 2012 (see section 7).

5. Performance against last year's plan

5.1. Unit 1

Planned Net Heat Rate			10,404
Reconciliation to Planned Net Heat Rate	Planned	Actual	
Boiler Losses	190	172	(18)
Turbine Losses	759	634	(125)
Other Losses	(66)	87	153
Actual Net Heat Rate			10,413

Negative numbers in the table above are improvements to heat rate.

5.2. Unit 2

Planned Net Heat Rate			10,528
Reconciliation to Planned Net Heat Rate	Planned	Actual	
Boiler Losses	167	151	(16)
Turbine Losses	836	598	(238)
Other Losses	0	78	78
Actual Net Heat Rate			10,352

Negative numbers in the table above are improvements to heat rate.

5.3. Unit 3

Planned Net Heat Rate			10,479
Reconciliation to Planned Net Heat Rate	Planned	Actual	
Boiler Losses	196	196	0
Turbine Losses	736	537	(200)
Other Losses	26	47	21

Actual Net Heat Rate	10,300
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Negative numbers in the table above are improvements to heat rate.

5.4. Unit 4

Planned Net Heat Rate		10,473
Reconciliation to Planned Net Heat Rate	Planned	Actual
Boiler Losses	139	164 24
Turbine Losses	719	589 (131)
Other Losses	100	52 (48)
Actual Net Heat Rate		10,319

Negative numbers in the table above are improvements to heat rate.

6. Major Losses for Current Planned Net Heat Rate

This section of the heat rate plan identifies the reconciliation of the items that have the most impact between the As-built Net Heat Rate and the Planned Net Heat Rate.

6.1. Unit 1

As-Built Net Heat Rate	9,520
Boiler Losses	201
Turbine Losses	795
Other Losses	-117
Planned Net Heat Rate	10,399

6.2. Unit 2

As-Built Net Heat Rate	9,525,839
Boiler Losses	258,135
Turbine Losses	502,767
Other Losses	-35
Planned Net Heat Rate	10,593,423

6.3. Unit 3

As-Built Net Heat Rate	9,521
Boiler Losses	201
Turbine Losses	660
Other Losses	9
Planned Net Heat Rate	10,391

6.4. Unit 4

As-Built Net Heat Rate	9,515
Boiler Losses	150
Turbine Losses	720
Other Losses	14
<u>Planned Net Heat Rate</u>	<u>10,399</u>

7. Major Unit Specific Initiatives

This section identifies the major planned capital and operational activities to improve or regain lost heat rate for the current 10-year plan.

7.1. Unit 1

Table 1 shows the capital projects included in the 10-year plan that contribute to the recovery of lost heat rate. Numbers inside parentheses are negative impact on heat rate and represent improvement to the overall unit efficiency.

7.2. Unit 2

Table 2 shows the capital projects included in the 10-year plan that contribute to the recovery of lost heat rate. Numbers inside parentheses are negative impact on heat rate and represent improvement to the overall unit efficiency.

7.3. Unit 3

Table 3 shows the capital projects included in the 10-year plan that contribute to the recovery of lost heat rate. Numbers inside parentheses are negative impact on heat rate and represent improvement to the overall unit efficiency.

7.4. Unit 4

Table 4 shows the capital projects included in the 10-year plan that contribute to the recovery of lost heat rate. Numbers inside parentheses are negative impact on heat rate and represent improvement to the overall unit efficiency.

8. Annual Review and Update

This plan will be reviewed and updated annually by the Jim Bridger plant management team by March 31.

9. Appendix

Figure 1
Jim Bridger Unit 1
10-year Plan Heat Rate Goals

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
As-Built Net Heat Rate - Btu/kWh	9,533	9,533	9,533	9,520	9,533	9,520	9,518	9,516	9,516	9,516	9,516	9,516	9,516	9,516	9,516	9,516
Planned Net Heat Rate - Btu/kWh	10,473	10,434	10,440	10,408	10,404	10,399	10,268	10,164	10,164	10,165	10,151	10,141	10,141	10,141	10,141	10,141
Actual Net Heat Rate - Btu/kWh	10,560	10,657	10,354	10,336	10,413	10,413	10,268	10,164	10,164	10,165	10,151	10,141	10,141	10,141	10,141	10,141
Capacity Factor	85%	83%	73%	88%	83%	84%	64%	86%	86%	85%	74%	87%	88%	85%	76%	87%
Annual Deviation from Plan - %	0.83%	2.14%	-0.82%	-0.69%	0.09%	0.18%										
Four-year Average Deviation from Plan - %	0.83%	1.48%	0.72%	0.36%	0.18%											

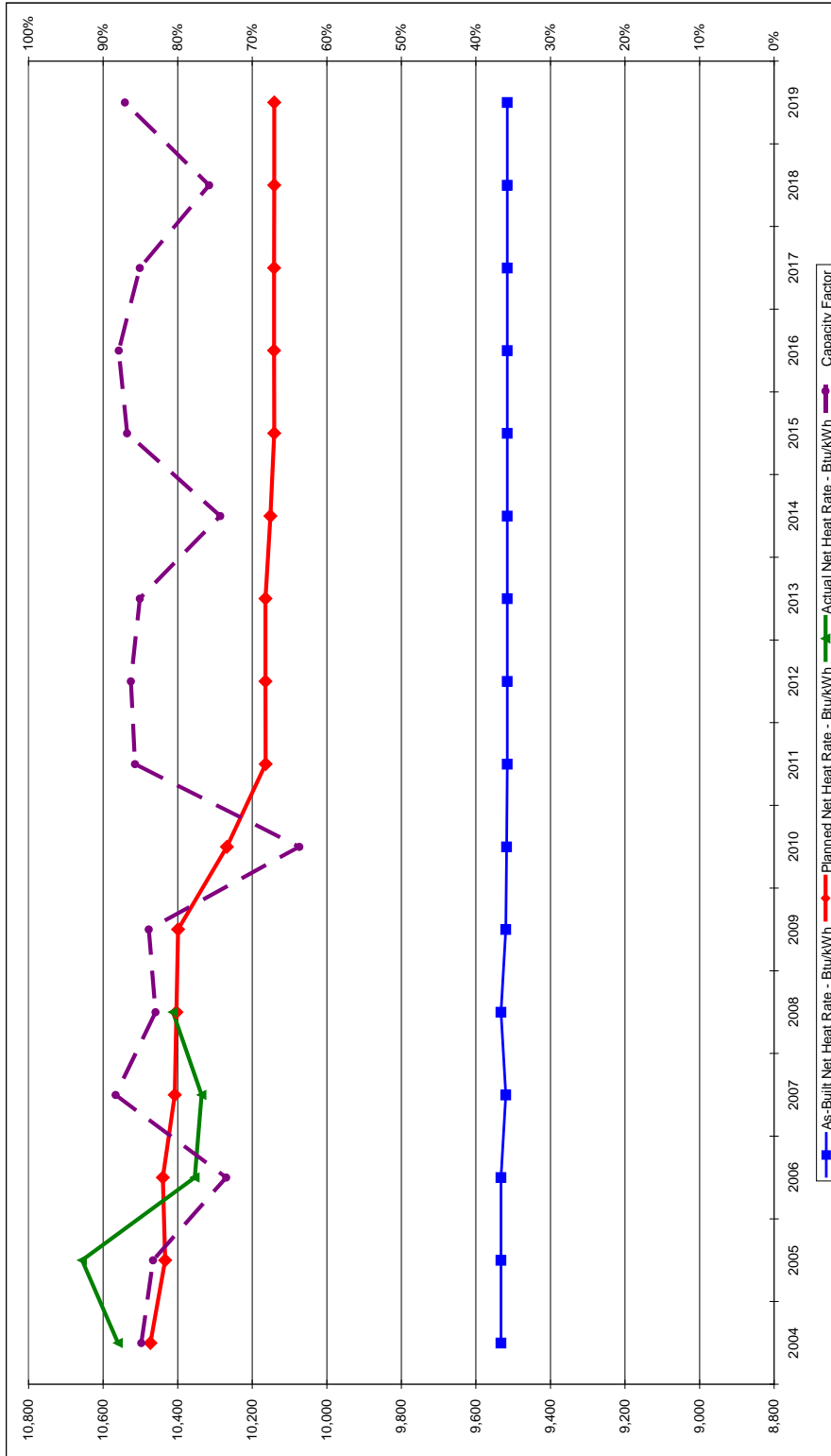


Figure 2
Jim Bridger Unit 2
10-year Plan Heat Rate Goals

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
As-Built Net Heat Rate - Btu/kWh	9,535	9,535	9,535	9,525	9,535	9,533	9,538	9,538	9,538	9,527	9,520	9,520	9,535	9,535	9,535	9,535
Planned Net Heat Rate - Btu/kWh	10,472	10,294	10,460	10,473	10,528	10,423	10,487	10,486	10,483	10,328	10,158	10,153	10,147	10,143	10,143	10,142
Actual Net Heat Rate - Btu/kWh	10,672	10,536	10,342	10,425	10,352											
Capacity Factor	78%	70%	86%	86%	86%	71%	87%	87%	86%	76%	89%	89%	87%	77%	88%	89%
Annual Deviation from Plan - %	1.91%	2.35%	-1.13%	-0.46%	-1.67%											
Four-year Average Deviation from Plan - %	1.91%	2.13%	1.04%	0.67%	-0.23%											

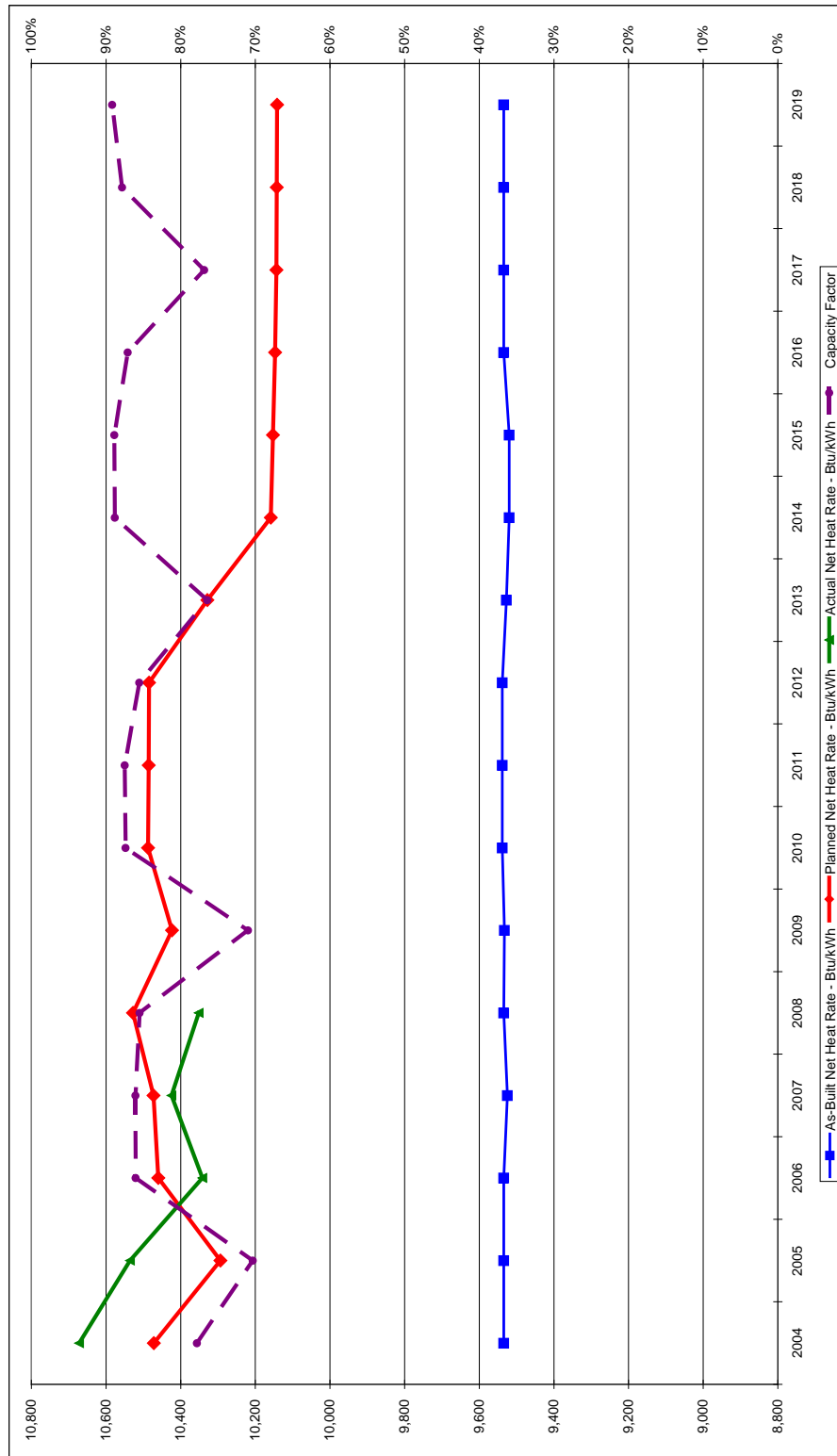


Figure 3
Jim Bridger Unit 3
10-year Plan Heat Rate Goals

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
As-Built Net Heat Rate - Btu/kWh	9,521	9,521	9,521	9,521	9,521	9,521	9,521	9,518	9,516	9,511	9,516	9,511	9,516	9,516	9,516	9,516
Planned Net Heat Rate - Btu/kWh	10,470	10,230	10,590	10,513	10,479	10,391	10,388	10,258	10,150	10,147	10,142	10,198	10,257	10,256	10,254	10,169
Actual Net Heat Rate - Btu/kWh	10,588	10,646	10,491	10,496	10,300											
Capacity Factor	80%	84%	83%	73%	89%	87%	85%	72%	87%	89%	87%	65%	88%	87%	87%	77%
Annual Deviation from Plan - %	1.13%	4.07%	-0.94%	-0.16%	-1.70%											
Four-year Average Deviation from Plan - %	1.13%	2.60%	1.42%	1.02%	0.52%											

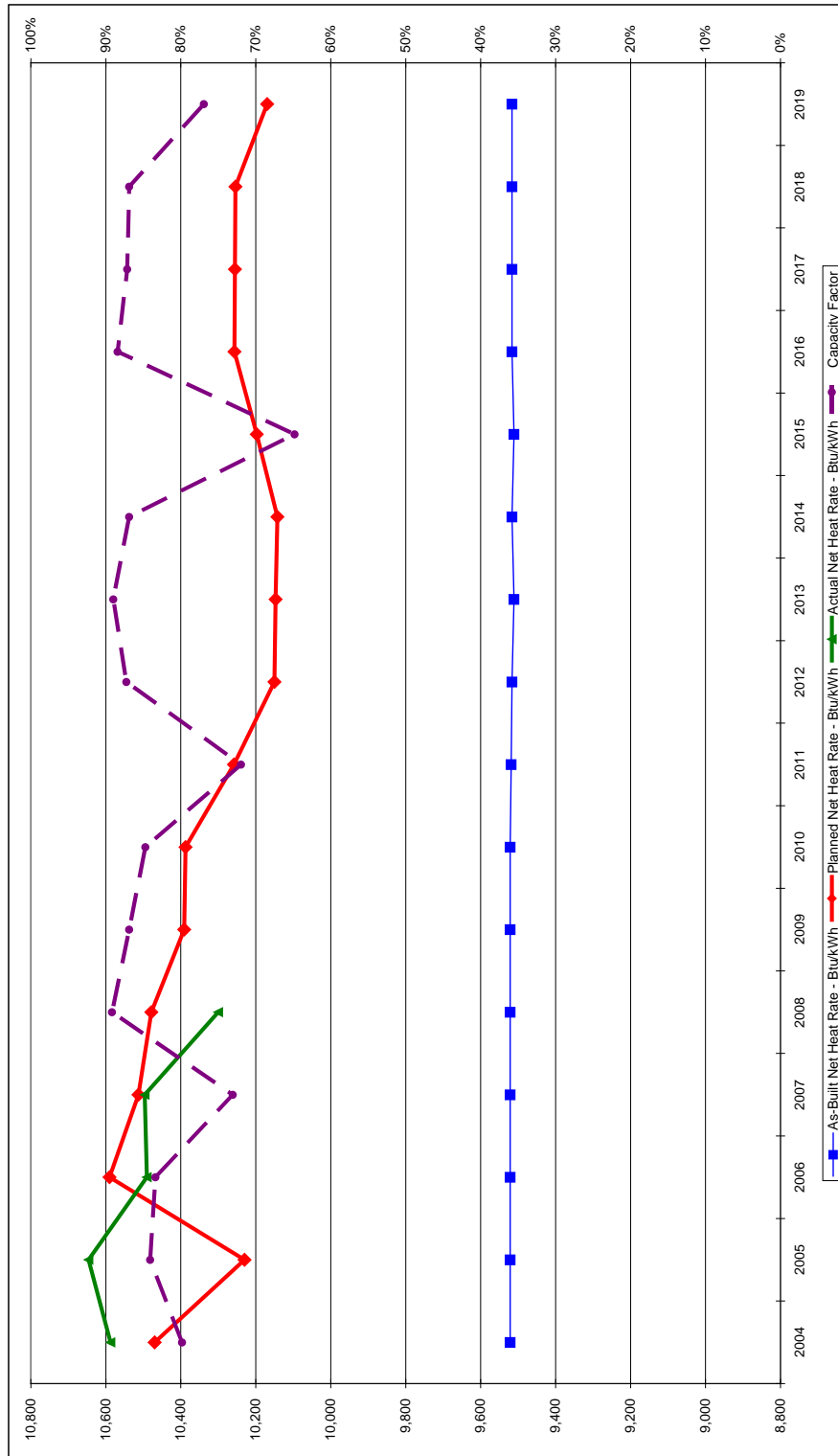


Figure 4
Jim Bridger Unit 4
10-year Plan Heat Rate Goals

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
As-Built Net Heat Rate - Btu/kWh	9,516	9,516	9,516	9,515	9,516	9,526	9,526	9,526	9,514	9,507	9,507	9,507	9,507	9,507	9,507	9,507
Planned Net Heat Rate - Btu/kWh	10,470	10,382	10,468	10,539	10,473	10,399	10,395	10,391	10,252	10,066	10,060	10,055	10,109	10,169	10,168	10,181
Actual Net Heat Rate - Btu/kWh	10,378	10,470	10,530	10,571	10,319											
Capacity Factor	71%	81%	81%	85%	71%	86%	85%	84%	72%	87%	87%	88%	65%	87%	85%	89%
Annual Deviation from Plan - %	-0.88%	0.85%	0.59%	0.30%	-1.47%											
Four-year Average Deviation from Plan - %	-0.88%	-0.01%	0.19%	0.22%	0.07%											

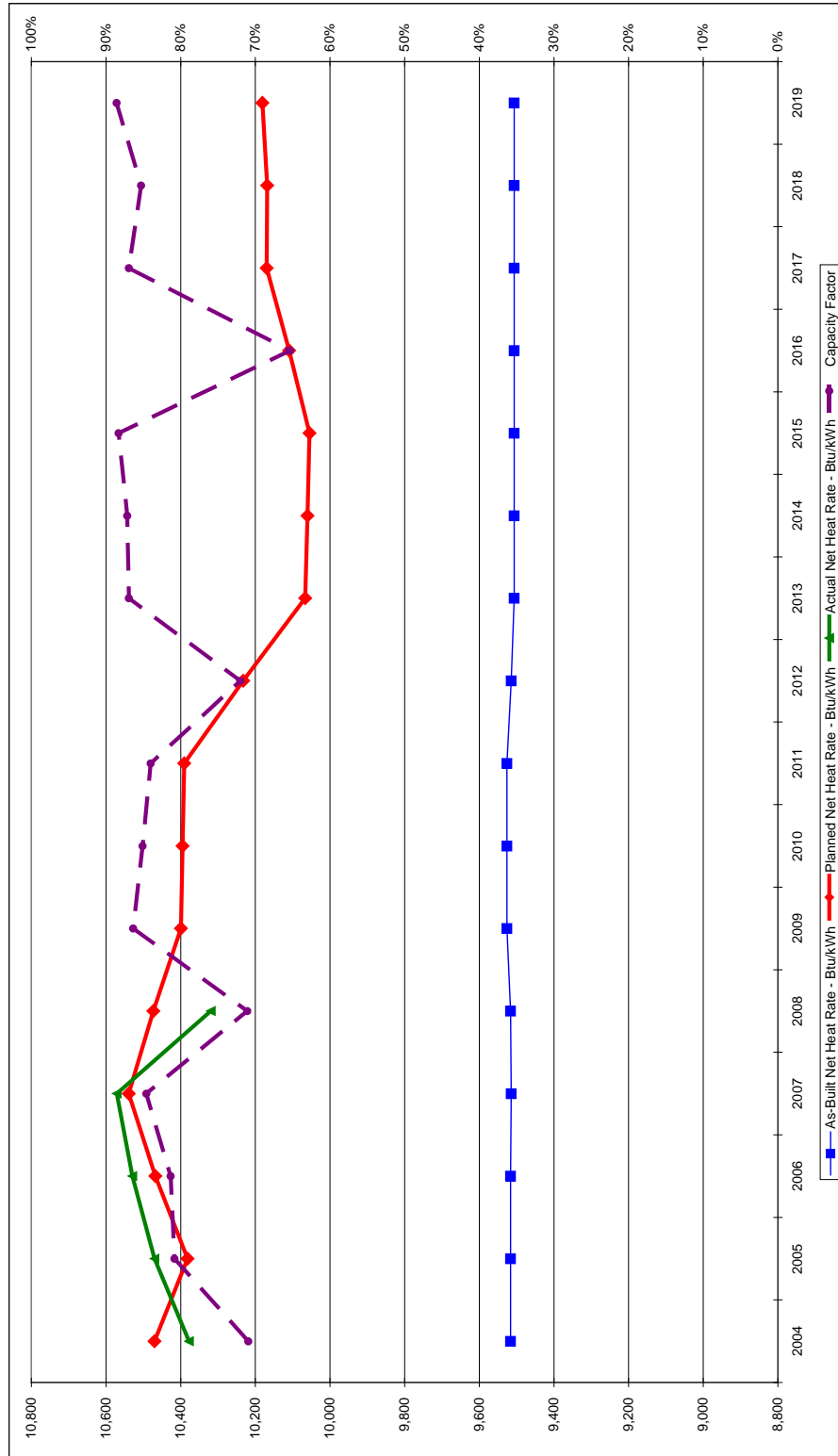


Table 1
Jim Bridger Unit 1
10-year Plan Heat Rate Improvement Projects

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Budgeted / Planned Heat Rate Changes, Net basis (Improvements are negative)											
Controls Upgrade		-70	-70	-70	-70	-70	-70	-70	-70	-70	-70
Turbine Upgrade Dense Pack (+21MWn 2014)		-212	-363	-363	-363	-363	-363	-363	-363	-363	-363
Total adjustments related to Capital Projects	-70	-282	-433	-433	-433	-433	-433	-433	-433	-433	-433
Budgeted / Planned Auxiliary Load Changes											
Reduced auxiliary load benefit of Budgeted / Planned	KW	-204	-204	-204	-204	-204	-204	-204	-204	-204	-204
Drag Chain conveyor	KW	-553	-553	-553	-553	-553	-553	-553	-553	-553	-553
Clean Air Initiative - WFGD (90%) LNB	KW	464	795	795	795	795	795	795	795	795	795
Total Auxiliary Load Changes	KW	-757	-293	38	38	38	38	38	38	38	38
Budgeted / Planned Net Dependable Rating Changes, (Net Basis)											
Turbine Upgrade Dense Pack (+18MWn 2010 12h)	MW	11	18	18	18	18	18	18	18	18	18
Scrubber Upgrade	MW	-3	-5	-5	-5	-5	-5	-5	-5	-5	-5
Total Capacity Changes	MW	0	8	14	14	14	14	14	14	14	14

Table 2
Jim Bridger Unit 2
10-year Plan Heat Rate Improvement Projects

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Budgeted / Planned Heat Rate Changes, Net basis (Improvements are negative)											
Controls Upgrade		-18	-18	-18	-18	-18	-18	-18	-18	-18	-18
Turbine Upgrade Dense Pack (+21MWn 2013)					-212	-363	-363	-363	-363	-363	-363
Total adjustments related to Capital Projects		-18	-18	-18	-229	-381	-381	-381	-381	-381	-381
Budgeted / Planned Auxiliary Load Changes											
Reduced auxiliary load benefit of Budgeted / Plann		-53	-53	-53	-53	-53	-53	-53	-53	-53	-53
Drag Chain Conveyor		-530	-530	-530	-530	-530	-530	-530	-530	-530	-530
Clean Air Initiative - WFGD (90%) LNB		464	795	795	795	795	795	795	795	795	795
Total Auxiliary Load Changes		-120	211	211	211	211	211	211	211	211	211
Budgeted / Planned Net Dependable Rating Changes, (Net Basis)											
Turbine Upgrade Dense Pack (+18MWn 2013)					11	18	18	18	18	18	18
Scrubber Upgrade		-2	-5	-5	-5	-5	-5	-5	-5	-5	-5
Total Capacity Changes		-2	-5	-5	6	14	14	14	14	14	14

**Table 3
Jim Bridger Unit 3
10-year Plan Heat Rate Improvement Projects**

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Budgeted / Planned Heat Rate Changes, Net basis (Improvements are negative)											
Turbine Upgrade Dense Pack (+21MWn 2011)			-212	-363	-363	-363	-363	-363	-363	-363	-363
Total adjustments related to Capital Projects	0	0	-212	-363	-363	-363	-363	-363	-363	-363	-363
Budgeted / Planned Auxiliary Load Changes											
Clean Air Initiative - WFGD (90%) LNB			464	795	464	795	464	795	795	795	795
Total Auxiliary Load Changes	0	0	464	795	464	795	464	795	795	795	795
Budgeted / Planned Net Dependable Rating Changes, (Net Basis)											
Turbine Upgrade Dense Pack (+21MWn 2011)			11	18	18	18	18	18	18	18	18
SCR addition (2015 -6MWn)							-4	-6	-6	-6	-6
Total Capacity Changes	0	0	8	14	14	14	10	8	8	8	8

Table 4
Jim Bridger Unit 4
10-year Plan Heat Rate Improvement Projects

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Budgeted / Planned Heat Rate Changes, Net basis (Improvements are negative)											
41 Feedwater heater replacement	-70	-70	-70	-70	-70	-70	-70	-70	-70	-70	-70
Turbine Upgrade Dense Pack (+18MW/n 2012)			-212	-363	-363	-363	-363	-363	-363	-363	-363
Total adjustments related to Capital Projects	-70	-70	-70	-282	-433	-433	-433	-433	-433	-433	-433
Budgeted / Planned Auxiliary Load Changes											
Reduced auxiliary load benefit of Budgeted / Plann	-223	-223	-223	-223	-223	-223	-223	-223	-223	-223	-223
Clean Air Initiative - WFGD (90%) LNB	795	795	795	795	795	795	795	795	795	795	795
Total Auxiliary Load Changes	572	572	572	572	572	572	572	572	572	572	572
Budgeted / Planned Net Dependable Rating Changes, (Net Basis)											
Turbine Upgrade Dense Pack (+18MW/n 2012)				11	18	18	18	18	18	18	18
Total Capacity Changes	0	0	0	11	18	18	18	14	12	12	12

10. Required Signatures

Performance Engineer – Jim Bridger Plant		Bernie Caulfield	
Signature:	(on file)	Date:	27 March 2009

Engineering Manager – Jim Bridger Plant		Paul Fahlsing	
Signature:	(on file)	Date:	27 March 2009

Managing Director – Jim Bridger Plant		Bob Arambel	
Signature:	(on file)	Date:	27 March 2009