|  |  |
| --- | --- |
| **Section 1 – Executive Summary** | Page # |
|          Purpose | 1-2 |
|          IRP Process and stakeholder involvement | 1-2 |
|          Responding to the 2014 IRP issues | 1-3 |
|          Narrative of highlights from each section | 1-5 |
|          Table of two-year action items | 1-16 |
|          Use and Relevance of the Integrated Resource Plan | 1-17 |
|  |  |
| **Section 2 – Company Overview** |  |
|          Overview | 2-2 |
| o   Number of customers, areas served, differences in climate and customer density and geo spread | 2-2 |
| o   Therms served, etc. | 2-2 |
|          Pipelines and basin locations | 2-4 |
|          Core v. Non-Core (bundled vs unbundled) | 2-4 |
|          Company Organization (re district offices, gas supply, headquarters, etc.) | 2-5 |
|  |  |
| **Section 3 – Demand Forecasting** |  |
|          Overview | 3-2 |
|          Demand Areas | 3-2 |
|          Weather | 3-4 |
|          Methodology | 3-5 |
| o   Annual growth | 3-5 |
| o   Use per customer | 3-5 |
| o   Peak Day | 3-5 |
|          Sensitivity Analysis | 3-6 |
|          Results | 3-7 |
| o   Geography | 3-8 |
| o   High and Low Scenarios | 3-9 |
|          Alternative Forecasting Methodologies | 3-10 |
|          Uncertainties | 3-11 |
|  |  |
| **Section 4 – Supply-Side Resources** |  |
|          Overview | 4-2 |
|          Gas supply resource | 4-2 |
|          Firm Supply Contracts | 4-3 |
|          Storage resources | 4-5 |
|          Capacity resources | 4-7 |
|          Natural gas price forecast | 4-8 |
|          Development of the Basis Differential for Sumas, AECO and Rockies | 4-10 |
|          Incremental supply-side resource options | 4-10 |
|          Supply side uncertainties | 4-15 |
|          Financial derivatives and risk management | 4-16 |
|          Portfolio purchasing strategy | 4-18 |
|          Conclusions | 4-19 |
| **Section 5 – Environmental Considerations** |  |
|          Overview | 5-1 |
|          Purpose | 5-2 |
|          Context | 5-3 |
| o   National focus | 5-3 |
| o   Regional focus | 5-3 |
| o   Washington | 5-3 |
| o   Oregon | 5-4 |
|          Types of CO2 Adders | 5-5 |
|          Fugitive Methane Emissions | 5-8 |
|          Current Efforts by Cascade re Greenhouse Gas Reduction | 5-9 |
|          Proposed Direction | 5-10 |
|  |  |
| **Section 6 – Avoided Costs** |  |
|          Overview | 6-2 |
|          Costs incorporated | 6-2 |
|          Price Elasticity | 6-2 |
|          Incorporation of Carbon Adder | 6-5 |
|          Application | 6-5 |
|          Results | 6-5 |
|  |  |
| **Section 7 – Demand Side Management** |  |
|          Overview | 7-2 |
|          Conservation Potential | 7-13 |
|          Assessing Future Potential | 7-16 |
|          Conservation Two Year Action Plan | 7-18 |
|          Importance of Outreach and Increased Messaging | 7-21 |
|  |  |
| **Section 8 – Resource Integration** |  |
|          Overview | 8-2 |
|          Planning and modeling | 8-3 |
|          Tools used | 8-4 |
|          Resource optimization output and analysis reports | 8-5 |
|        Key inputs | 8-7 |
|          Results | 8-12 |
|          Alternatives resources selected | 8-13 |
|          Alternatives resources not selected | 8-13 |
|          Portfolio evaluation | 8-14 |
|          Stochastic analyses | 8-19 |
|          Stochastic results | 8-19 |
|          Alternative forecasting methodologies: scenario planning | 8-22 |
|          Conclusions | 8-23 |
|  |  |
| **Section 9 – Distribution System Planning** |  |
|          Overview | 9-1 |
|          Network Design Fundamentals | 9-1 |
|          Computer Modeling | 9-2 |
|          Distribution System Planning | 9-3 |
|          Distribution System Enhancements | 9-3 |
|          Pipelines | 9-3 |
|          Regulators | 9-4 |
|          Compression | 9-5 |
|          Conservation Resources | 9-5 |
|          Distribution Scenario Decision-Making Process | 9-6 |
|          Planning Results | 9-7 |
|          Conclusion | 9-8 |
|  |  |
| **Section 10 – Stakeholder Engagement** |  |
| <Agenda and minutes to be included in appendices> |  |
|          Overview | 10-2 |
|          Approach to meetings and workshops | 10-2 |
|          List of stakeholders | 10-2 |
|          Number and dates of TAG meetings | 10-3 |
|          Opportunity for public participation | 10-4 |
|  |  |
| **Section 11 – Regulatory Compliance** |  |
|          Approach to regulations, policies, and stakeholder comments | 11-2 |
|          Short history about compressed time schedule | 11-2 |
|          Resources provided and commitment throughout company | 11-2 |
|          Internal IRP Team | 11-3 |
|          IRP guidelines | 11-3 |
|          Compliance matrices | 11-3 |
|          Statement that the 2016 IRP fully complies with all regulations, orders, and comments | 11-3 |
|  |  |
| **Section12 – Two year Action Plan** |  |
|          2016 Action Plan | 12-2 |
|          Demand Side Resources (Conservation) | 12-2 |
|          Supply Side Resources | 12-3 |
|          Distribution System | 12-4 |
|          Integration | 12-4 |
|          2 Year action plan table | 12-5 |
|  |  |
| **Section 13 – Glossary and Miscellaneous References** |  |
|          Glossary | 13-2 |
|          Citygate/Zone Cross reference | 13-13 |
|          Additional Pipeline System Maps | 13-15 |
|  |  |
|  |  |
|  |  |
| **Appendices** |  |
| Appendix A - IRP Process |  |
| Appendix B - Demand Forecast |  |
| Appendix C - Guideline Compliance |  |
| Appendix D - Demand Side Management |  |
| Appendix E - Current and Alternative Supply Resources |  |
| Appendix F - Capacity Requirements & Peak Day Planning |  |
| Appendix G - Weather & Price Uncertainty Analyses |  |
| Appendix H - Avoided Cost Calculations |  |