



**Public Utility District No. 1 of Okanogan County**

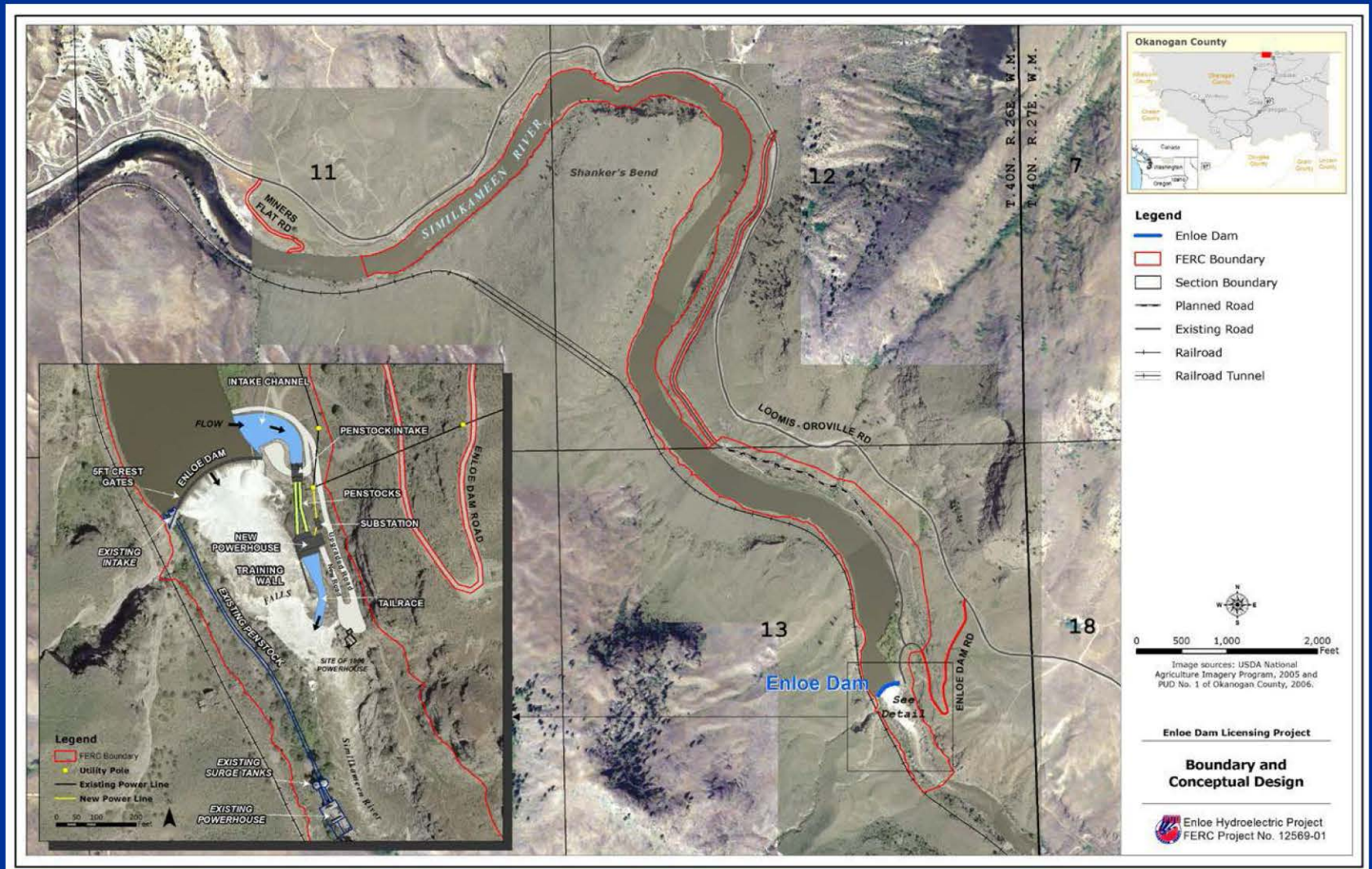
# **Board of Commissioners Meeting Enloe Hydroelectric Project**

**November 17, 2014**

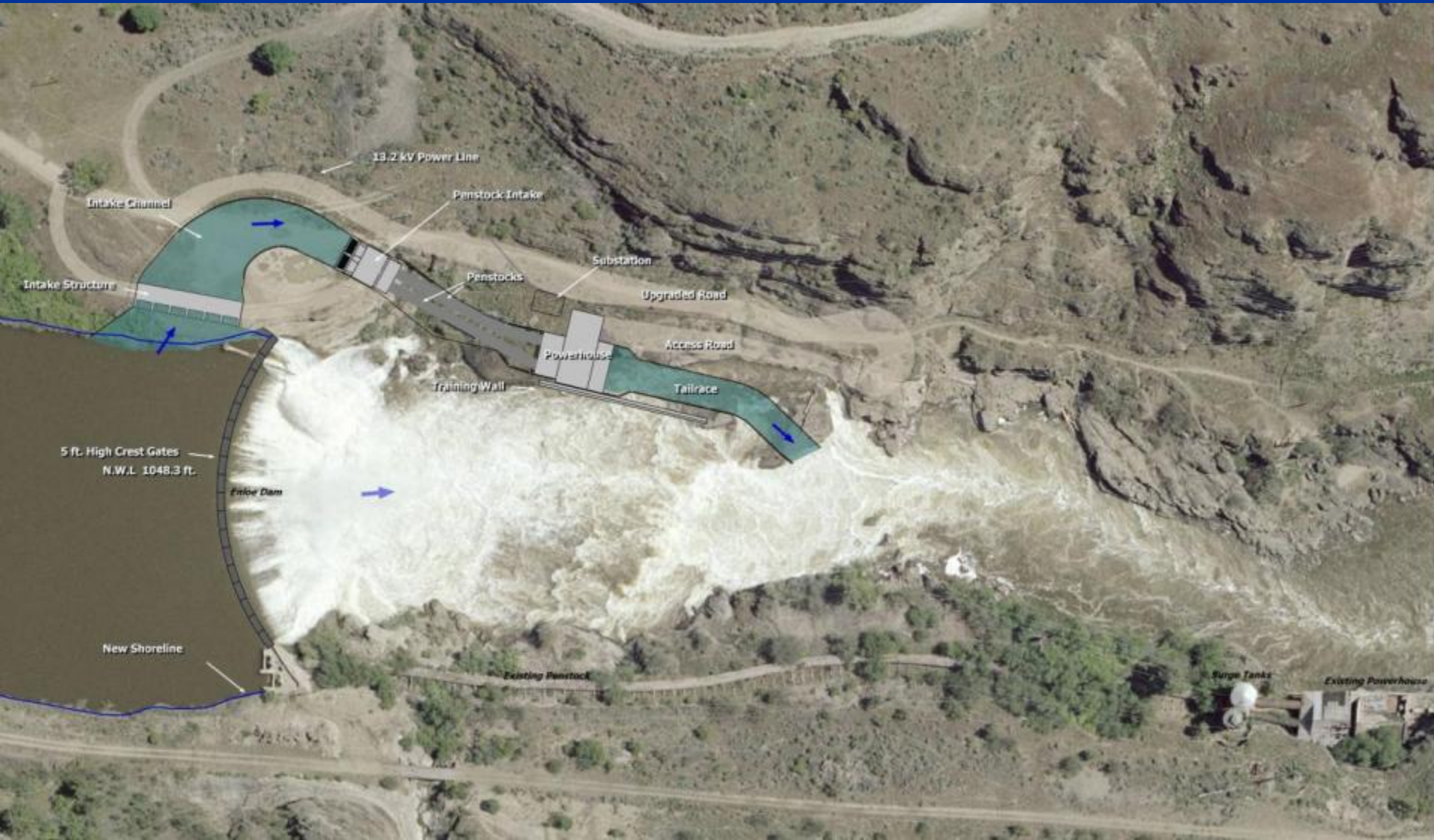
# Project Location



# Project Vicinity and Boundary Map



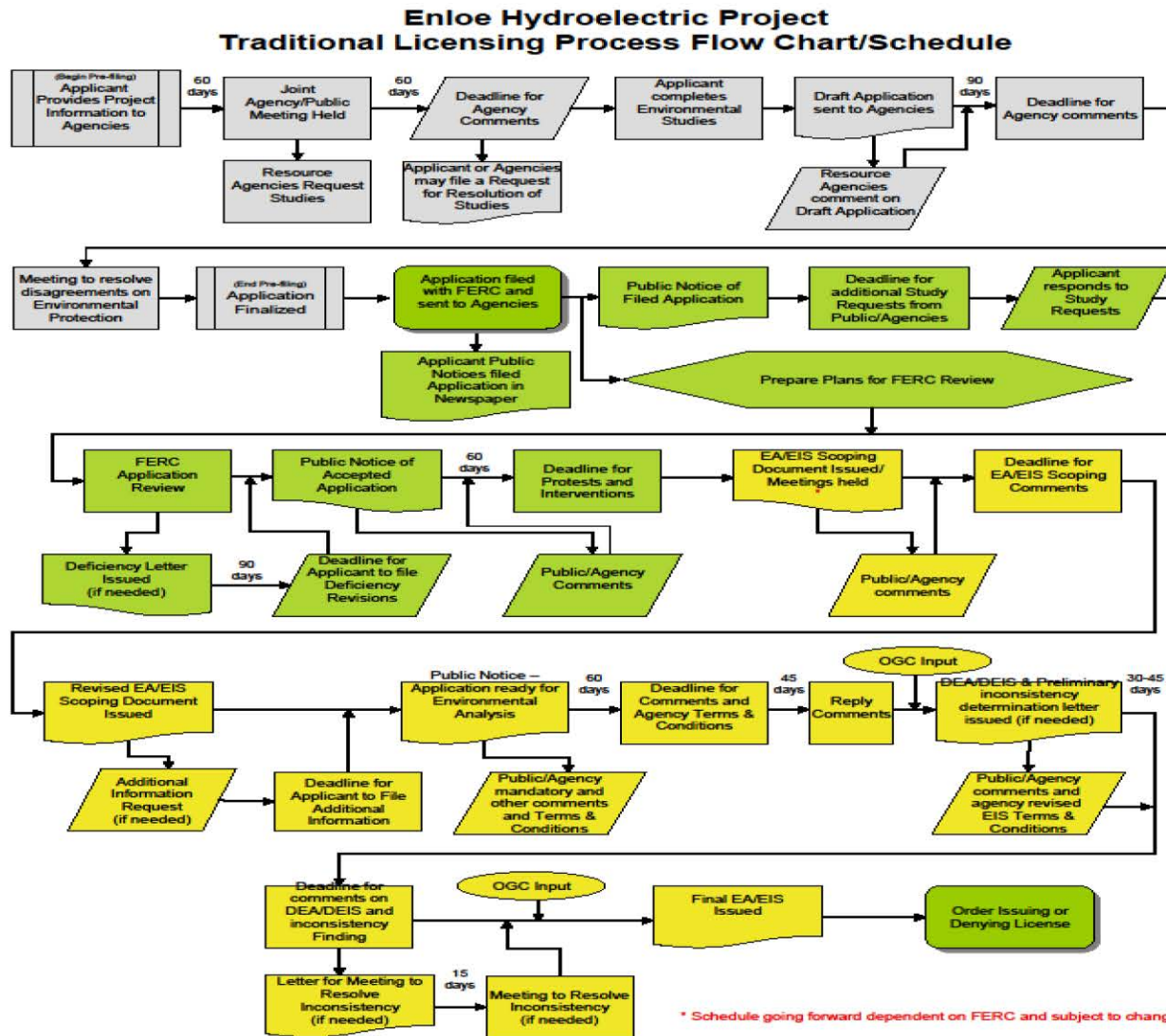
# New Powerhouse, Intake and Tailrace



# Comparison of Old and New Power Plants

<b>Power Plant</b>	<b>Old</b>	<b>New</b>
<b>Year Completed</b>	1923	2018
<b>No of Units</b>	2	2
<b>Type of Unit</b>	Francis	Kaplan
<b>Axis</b>	Horizontal	Vertical
<b>Generating Capacity (MW)</b>	3.2	9
<b>Rated Net Head (ft)</b>	78	77
<b>Annual Generation (GWh)</b>	22.5	45

# FERC Licensing Process



# FERC Process By Year - Major Highlights

- Traditional Licensing Process
- Initial Consultation Meeting
  - November 2005
- Studies Performed
  - Entire year 2006
- Draft License Application
  - November 2007
- Revise and File License Application with FERC
  - August 2008
- FERC Initiates NEPA Scoping and AIR's
  - Entire Year 2009

# FERC Process By Year - Major Highlights

- Submittals – 401, BLM R/W, Water Rights, etc.
  - Entire Year 2010
- Draft and Final EA's Published
  - May and August 2011
- Issuance of Permits and Certifications – 401, Bi-op, Programmatic Agreement & 401 Appeal
  - Entire Year 2012
- Final FERC License
  - July 2013
- FERC License Implementation and Compliance
  - Entire Year 2014



# Regulatory Compliance

- **FERC License – 97 Pages**
  - ▶ Issued - July 9, 2013
  - ▶ Effective - July 1, 2013
  - ▶ Expires - June 30, 2062
- **Terms and Conditions – Called Articles**
  - ▶ 202-206
    - Finalize Exhibits F & G, Headwater Benefits, Land Rights, Financing
  - ▶ 301-307
    - Construction, Dam Safety, Public Safety Plans, etc.
  - ▶ 400-416
    - Update Ecology Plans, Spoils Plans, Revegetation, Recreation Plans, Fire , Aesthetics Plans, Programmatic Agreement, etc.
  - ▶ Form L-2 General Articles 1 – 32
  - ▶ Appendix A – 401 Water Quality Certificate Conditions
  - ▶ Appendix B – NOAA Fisheries Terms and Conditions

# License Articles and Conditions

- The FERC license contains 61 Articles.
- Currently we have identified approximately 350 tasks for the life of the project (50 years).
- Approximately 120 tasks have been identified that have compliance deadlines between July 2013 and July 2015.
- The 350 and 120 tasks identified above do not include tasks associated with the BLM R/W, 401 rulings, ACOE 404 conditions, HPA conditions or any pre, during or post Engineering or Operations assignments.
- It's anticipated that there will be at a minimum 1000 tasks associated with construction, operations, maintenance and environmental.

# Revised Cost Figure - Summary

The estimated Capital Cost of implementing a 9-MW small hydropower plant at Enloe Dam has been updated to **mid-2014 price levels**. A summary of the updated cost estimate is shown on Table 1.

*Table 1 – Updated Capital Cost Estimates*

Cost Item	Cost Scenario	
	Probable (\$Million)	Adverse (\$Million)
■ Direct Costs	\$28.1	\$32.2
■ Indirect Costs	\$22.1	\$24.3
■ Total Capital Cost	\$50.2	\$56.5
■ Cost to Complete	\$39.1	\$45.5

Two cost estimate scenarios are provided. The “Probable” case represents the most likely capital cost scenario based on the project configuration in the FERC license, the present level of knowledge regarding site conditions, license terms and conditions, other permitting requirements and includes typical cost allowances for contingencies. The “Adverse” case includes larger, more conservative cost allowances for contingencies and shows the sensitivity of the capital cost estimate to allowances provided to account for residual uncertainties and cost risks.



# Revised Cost Figure – D-1

FERC Electric Plant Account		SCENARIO	
		Probable (2014\$)	Adverse (2014\$)
<b>DIRECT COSTS</b>			
<b>PRODUCTION PLANT</b>			
Hydraulic Production			
330	Land and Land Rights	\$0	\$0
331	Structures and Improvements	\$3,649,775	\$4,311,077
332	Reservoirs Dams and Waterways	\$9,493,349	\$11,074,282
333	Waterwheels Turbines and Generators	\$9,674,444	\$10,553,939
334	Accessory Electrical Equipment	\$767,811	\$897,820
335	Miscellaneous Powerplant Equipment	\$279,204	\$326,480
336	Roads Railroads and Bridges	\$451,871	\$554,873
<i>Sub total - Hydraulic Production Plant</i>		<i>\$24,316,454</i>	<i>\$27,718,472</i>
<b>TRANSMISSION PLANT</b>			
352	Transmission Structures and Improvements	\$125,642	\$156,456
353	Station Equipment	\$0	\$0
<i>Sub total - Transmission Plant</i>		<i>\$125,642</i>	<i>\$156,456</i>
<b>OTHER COSTS</b>			
Environmental Protection, Mitigation and Enhancement (PM&E) measures		\$1,877,609	\$2,438,109
Removal of Existing Power Facilities		\$1,760,448	\$1,907,152
<i>Sub total - Other Costs</i>		<i>\$3,638,057</i>	<i>\$4,345,261</i>
<b>SUBTOTAL - DIRECT COSTS</b>		<b>\$28,080,153</b>	<b>\$32,220,189</b>
<b>INDIRECT COSTS (To Complete)</b>			
<b>ENGINEERING, ENVIRONMENTAL, LEGAL AND ADMINISTRATIVE COSTS</b>			
Sunk Costs			
Sunk Project Licensing Costs - Excluding AFUDC (Through 9/2014)		\$11,058,637	\$11,058,637
Final Engineering Design & Construction Management (2015-2018)		\$5,272,591	\$5,960,320
Environmental Studies and Compliance (2015 - 2018)		\$2,902,371	\$3,482,846
Owners Administrative, Legal and Other Costs (2015-2018)		\$906,250	\$1,650,000
Allowance for Interest During Construction Period		\$1,936,515	\$2,183,579
<b>SUBTOTAL - INDIRECT COSTS</b>		<b>\$22,076,364</b>	<b>\$24,335,382</b>
<b>ESTIMATED CAPITAL COST (rounded)</b>		<b>\$50,160,000</b>	<b>\$56,560,000</b>
<b>ESTIMATED COST TO COMPLETE (excluding sunk costs - rounded)</b>		<b>\$39,100,000</b>	<b>\$45,500,000</b>



# Cost Figure – 2007 D-2

Item		Qty	Cost		
			(\$)	(\$/kW)	(\$/kWh)
<b>Generation Data</b>					
	Plant Capacity (MW)	9			
	Net Average Annual Generation (GWh)	45			
	Capacity Factor (%)	57.0%			
<b>Plant Investment</b>					
	Plant Investment Cost		\$30,980,000	\$3,442	
<b>Annual Cost</b>					
I. Capital Costs					
	a. Interest on Capital	4.50%	\$1,394,100	\$155	\$0.0310
	b. Capital recovery cost (40yr, 4.5%)	0.93%	\$289,451	\$32	\$0.0064
	Total Capital Costs		\$1,683,551	\$187	\$0.0374
	II. Insurance	0.20%	\$61,960	\$7	\$0.0014
	III. Taxes - Privilege Tax (% of first 4 mills/kWh)	5.35%	\$9,630	\$1	\$0.0002
	IV. Operation and Maintenance		\$600,000	\$67	\$0.0133
	V. Environmental Measures (40yr, 4.5%)		\$34,624	\$4	\$0.0008
	VI. Administrative and General/Contingency	35%	\$222,118	\$25	\$0.0049
	<b>Total Generation Cost</b>		<b>\$2,611,883</b>	<b>\$290</b>	<b>\$0.0580</b>



# Revised Cost Figure – 2014 D-2 (including sunk costs)

Item	SCENARIO							
	Qty	Probable			Qty	Adverse		
		Cost (\$2014)				Cost (\$2014)		
		(\$K)	(\$/kW)	(\$/kWh)		(\$K)	(\$/kW)	(\$/kWh)
<b>Generation Data</b>								
Plant Capacity (MW)	9.0				9.0			
Net Average Annual Generation (GWh)	45.0				45.0			
Capacity Factor (%)	57%				57%			
<b>Plant Investment</b>								
Plant Investment Cost		\$50,160	\$5,573			\$56,560	\$6,284	
<b>Annual Cost</b>								
I. Capital Costs								
a. Interest on capital	4.00%	\$2,006	\$223	\$0.045	4.00%	\$2,262	\$251	\$0.050
b. Amortization of capital	1.78%	\$582	\$65	\$0.013	1.78%	\$656	\$73	\$0.015
Capital Costs		\$2,589	\$288	\$0.058		\$2,919	\$324	\$0.065
Insurance	0.20%	\$100	\$11	\$0.002	0.20%	\$113	\$13	\$0.003
Privilege Tax	5.35%	\$10	\$1	\$0.000	5.35%	\$10	\$1	\$0.000
Operation and Maintenance (levelized)		\$985	\$109	\$0.022		\$1,182	\$131	\$0.026
Environmental Measures (levelized)		\$223	\$25	\$0.005		\$406	\$45	\$0.009
Administrative/Contingency (levelized)	35%	\$423	\$47	\$0.009	35%	\$556	\$62	\$0.012
Operating Expenses		\$1,741	\$193	\$0.039		\$2,267	\$252	\$0.050
<b>Total Cost</b>		<b>\$4,330</b>	<b>\$769</b>	<b>\$0.096</b>		<b>\$5,186</b>	<b>\$901</b>	<b>\$0.115</b>
<b>Levelized Cost of Energy</b>				<b>\$0.088</b>				<b>\$0.106</b>



# Revised Cost Figure – 2014 D-2 (excluding sunk costs)

Item	SCENARIO							
	Qty	Probable			Qty	Adverse		
		Cost (\$2014)				Cost (\$2014)		
		(\$K)	(\$/kW)	(\$/kWh)		(\$K)	(\$/kW)	(\$/kWh)
<b>Generation Data</b>								
Plant Capacity (MW)	9.0				9.0			
Net Average Annual Generation (GWh)	45.0				45.0			
Capacity Factor (%)	57%				57%			
<b>Plant Investment</b>								
Plant Investment Cost		\$39,100	\$4,344			\$45,500	\$5,056	
<b>Annual Cost</b>								
<b>I. Capital Costs</b>								
a. Interest on capital	4.00%	\$1,564	\$174	\$0.035	4.00%	\$1,820	\$202	\$0.040
b. Amortization of capital	1.78%	\$454	\$50	\$0.010	1.78%	\$528	\$59	\$0.012
Capital Costs		\$2,018	\$224	\$0.045		\$2,348	\$261	\$0.052
Insurance	0.20%	\$78	\$9	\$0.002	0.20%	\$91	\$10	\$0.002
Privilege Tax	5.35%	\$10	\$1	\$0.000	5.35%	\$10	\$1	\$0.000
Operation and Maintenance (levelized)		\$985	\$109	\$0.022		\$1,182	\$131	\$0.026
Environmental Measures (levelized)		\$223	\$25	\$0.005		\$406	\$45	\$0.009
Administrative/Contingency (levelized)	35%	\$423	\$47	\$0.009	35%	\$556	\$62	\$0.012
Operating Expenses		\$1,719	\$191	\$0.038		\$2,245	\$249	\$0.050
<b>Total Cost</b>		<b>\$3,737</b>	<b>\$639</b>	<b>\$0.083</b>		<b>\$4,593</b>	<b>\$771</b>	<b>\$0.102</b>
<b>Levelized Cost of Energy</b>				<b>\$0.077</b>				<b>\$0.094</b>



*Questions?*