PUBLIC SERVICE COMMISSION
STATE OF MONTANA

1701 Prospect Avenue
PO Box 202601
Helena, MT 59620-2601
Voice: 406.444.6199
Fax #: 406.444.7618
http://psc.mt.gov
E-Mail: psc_webmaster@mt.gov

MEMORANDUM

TO: Commissioners, Docket No. D2013.12.85 service list

FROM: Kate Whitney, Regulatory Division Administrator

DATE: March 31, 2014

RE: Essex Partnership's due diligence checklist

The Commission contracted with an engineering consultant, The Essex Partnership, to review NorthWestern's due diligence efforts prior to its proposed acquisition of PPL Montana's hydroelectric facilities in Montana. Essex's first task included developing a checklist for each hydro project that provided Essex's assessment of the completeness and quality of the source documents and of the completeness and adequacy of NorthWestern's due diligence review and projections of capital and O&M expenses. Essex's checklists for the 12 hydro projects have been combined into one document. The public version of the Essex checklist document is attached. The public version contains redactions of Critical Energy Infrastructure Information which is protected by PSC Protective Order No. 7323. The pages containing protected material are filed in the PSC's locked proprietary file cabinet and have been mailed under separate cover to the parties who have signed the appropriate non-disclosure agreement.

Project/Development/FERC ID			Year Built	License Expiration			
Missouri-Madison Project/Black Eagle Development/FERC No. 2188-05			1926-1927	8/31/2040			
No.	**Item**	**Specific Issue**	**Source Document(s)** ***(Explicitly identify that part of the record that would indicate there is a potential problem)***	**Describe the concern**	**Potential Remedy**	**Potential to incur significant costs (> $0.5 million) Yes or No**	**Other Comments**
1	**Water Retaining Structures (Spillways/Nonoverflows/Intakes/Intake-Powerhouses/Embankments)**						
a	Wastegate structure		Exhibit__(WTR-5.1), pp 88, 95; Exhibit__(WTR-6.1), p 6			Yes	
b	Spillway	(PFM 2, Category II)	Exhibit__(WTR-5.1), pp 20,21,24,28,44; Exhibit__(WTR-6.1), p 9; Exhibit__(WTR-2.1, pp 54			Yes	
c	Forebay	(PFM 4B, Category II)	Exhibit__(WTR-5.1), Docket No. D2013.12.85, pp 26, 27; Exhibit__(WTR-6.1), Docket No. D2013.12.85, p 8			Yes	

No.	Item	Specific Issue	Source Document(s) *(Explicitly identify that part of the record that would indicate there is a potential problem)*	Describe the concern	Potential Remedy	Potential to incur significant costs (> $0.5 million) Yes or No	Other Comments
d	Dam	[redacted]	Exhibit__(WTR-5.1), p 133; Exhibit__(WTR-6.1), p 6; Exhibit__(WTR-2.1), p 195	[redacted]	[redacted]	Yes	

	Project/Development/FERC ID		Year Built	License Expiration			
	Missouri-Madison Project/Black Eagle Development/FERC No. 2188-05		1926-1927	8/31/2040			
No.	**Item**	**Specific Issue**	**Source Document(s) *(Explicitly identify that part of the record that would indicate there is a potential problem)***	**Describe the concern**	**Potential Remedy**	**Potential to incur significant costs (> $0.5 million) Yes or No**	**Other Comments**
1	Plant General Arrangement & 1-Line						
a	Back-up and Emergency Power	Back-up sources of electric power required in the event of an emergency or utility outage.	Emergency Action Plan (WTR-8.1)	None anticipated.	N/A	No.	[redacted]
b	Reliability (i.e., n-1 design service loss)	Impact of the loss of any one major component results in the loss of generation of one unit.	Document 7.7.3.41.7.2.1.1 41426-C1-1-0-1-24X36	[redacted]	[redacted]	Yes	
2	Interconnection & Transmission						
a	Power rating - normal configuration	Transmission System capability for evacuation of power from the plant with a normal system configuration.	No information available.	No detailed information from NW due diligence.	Unknown. Insufficient information regarding transmission system constraints.	Yes	System interconnection studies can determine power transfer capabilities under normal and contingency conditions.
b	Power rating - 1st contingency	Transmission System capability for evacuation of power from the plant under a 1st contingency condition.	No information available.	No detailed information from NW due diligence.		Yes	
3	Automation and Controls						
a	Exciter and Governor - WECC Compliance	Exciter and Governors conform to WECC requirements	Shaw Due Diligence Report (WTR-2.1)	None anticipated	N/A	No	Governor and Exciter upgrades performed.
b	Remote Monitoring & Control Capability	Plant operational from remote control center	Shaw Due Diligence Report (WTR-2.1)	None anticipated	N/A	No	Upgrades performed.
c	Automatic Controls and Protection	Control and protection systems designed for automatic operation.	Shaw Due Diligence Report (WTR-2.1)	None anticipated	N/A	No	Upgrades performed.
4	Main Step-up Transformers						
a	Age	Age is an indicator of the remaining useful life of a transformer.	Data Response PSC-179	None anticipated	N/A	No	18.6 MVA 3-phase transformer installed in 2012
b	Loading History	Loading history is an indicator of the remaining useful life of a transformer.	Data Response PSC-179	None anticipated			Three 6 MW units connect to a single 18.6 MVA transformer. At full rated generator output, the transformer can become overloaded for powerfactors off unity.
c	Dissolved Gas Analysis (DGA) Test Data	Regular PM checks of dissolved gasses in the oil are an industry-accepted measure of the condition of a transformer.	Data Response PSC-179	None anticipated			Tests rated "Good" (2012 & 2013)
5	Generators						
a	Stator Winding - Type and Age	The age and type of winding is an indicator of its remaining useful life.	Shaw Due Diligence Report (WTR-2.1)	Generators were originally installed in 1927 and rewound in 1981 (U2), 1982 (U1) and 2001 (U3). Next projected rewinds (per PSC-066/Mustang Evaluation) are 2020 (U1 and U2).	Rewind generator.	Yes. No detailed information from	

No.	Item	Specific Issue	Source Document(s) *(Explicitly identify that part of the record that would indicate there is a potential problem)*	Describe the concern	Potential Remedy	Potential to incur significant costs (> $0.5 million) Yes or No	Other Comments
b	Windings Test Data - PI, Doble, etc.	Routine PM tests can measure the loss of insulation life and be indicators for a rewind.		No detailed information from NW due diligence.		NW due diligence report that machine parts will not need to be replaced before the scheduled date.	
c	Rotor - inspection reports for fatigue & cracks, field windings	Metal fatigue can cause cracking in the rotor components and ultimately lead to a catastrophic failure		No detailed information from NW due diligence.	Replace rotor components.		
d	Vibration data	Vibration monitoring can reveal mechanical problems in the gates, bearings and speed increasers (where applicable) that require repair.		No detailed information from NW due diligence.	Repair/replace bearings, gates.		

	Project/Development/FERC ID		Year Built	License Expiration			
	Missouri-Madison Project/Black Eagle Development/FERC No. 2188-05		1926-1927	8/31/2040			
No.	Item	Specific Issue	Source Document(s) *(Explicitly identify that part of the record that would indicate there is a potential problem)*	Describe the concern	Potential Remedy	Potential to incur significant costs (> $0.5 million) Yes or No	Other Comments
1	Auxillary mechanical systems						
a	Station dewatering	Keep submerged portions of the powerhouse structure and equipment dry.	None	No detailed information from NW due diligence.		Unknown	
b	HVAC	Maintain powerhouse ambient temperature within acceptable range.	None	No detailed information from NW due diligence.		Unknown	
c	Powerhouse crane	Lifting/rigging capability to support maintenace activities.	None	No detailed information from NW due diligence.		Unknown	
d	*Other (list)*						
2	Gates & Valves						
a	Penstock headgate	Means of stopping flow into the penstock and/or turbine.	None	No detailed information from NW due diligence.		Unknown	
b	Unit dewatering gates/valves	Means of dewatering pressure case/draft tube to support maintenance activities.	None	No detailed information from NW due diligence.		Unknown	
c	HPU/accumulator	Hydraulic power to operate gates and valves.	None	No detailed information from NW due diligence.		Unknown	
d	*Other (list)*						
3	Governor System						
a	Full governor/gate actuator	Means of controlling wicket gates and water flow to the turbine runner.	WTR-2.1, page 72.			Unknown	Governor upgrades have been implemented. No other detailed information from NW due diligence.
b	Accumulator/emergency close	Means of closing wicket gates/penstock headgates in the event of loss of station service.	None	No detailed information from NW due diligence.		Unknown	
c	*Other (list)*						
4	Turbines		WTR-2.1, page 72. PSC-066, attached CD, "Hydro Capital" tab.	Three propeller units. 1927 ISD. Original equipment. "Turbine-Generator upgrades planned 2020 - 2022. Insufficient data to confirm the adequacy of the proposed budget and schedule for the turbine overhauls.		Yes	
a	Bearings/alignment	Condition of wear surfaces, clearances,operating temperature, vibration and shaft alignment.	None	No detailed information from NW due diligence.		Unknown	
b	Pressure case	Structural integrity, metalurgical fatigue, ability to safely withstand normal and transient operating conditions.	None	No detailed information from NW due diligence.		Unknown	
c	Stay vanes & wicket gates	Condition, hydraulic profiles, wicket gate linkage and wicket gate pinch.	None	No detailed information from NW due diligence.		Unknown	
d	Runner	Structural integrity, cavitation damage, hydraulic profiles, metalurgical fatigue.	None	No detailed information from NW due diligence.		Unknown	
e	Seal clearances/Headcover pressure	Excessive seal clearances result in decreased performance and increased pressure on headcover.	None	No detailed information from NW due diligence.		Unknown	

No.	Item	Specific Issue	Source Document(s) *(Explicitly identify that part of the record that would indicate there is a potential problem)*	Describe the concern	Potential Remedy	Potential to incur significant costs (> $0.5 million) Yes or No	Other Comments
f	Draft tube	Structural integrity, hydraulic profile, maintain suction head for runners set above tailwater.	WTR-2.1, page 72.			No	Unit 2 draft tube liner repair was planned for 2013.

	Project/Development/FERC ID		Year Built	License Expiration			
	Missouri-Madison Project/Black Eagle Development/FERC No. 2188-05		1926-1927	8/31/2040			
No.	Item	Specific Issue	Source Document(s) *(Explicitly identify that part of the record that would indicate there is a potential problem)*	Describe the concern	Potential Remedy	Potential to incur significant costs (> $0.5 million) Yes or No	Other Comments
1	**Compliance with FERC License Order**						
a	Environmental requirements and management plans (WQ, fish and wildlife, recreation, lands, etc). Are there any outstanding compliance issues?	FERC licenses typicaly include specific environmental protection, mitigation, and enhancement (PM&E) measures.	Exhibit_(WTR-2.1), p 126-128 Exhibit_(WTR-2.3), p 12	None. Filings indicate the project is in compliance with license requirements.	NA	No	
b	Fish passage requirements (capital and operational)	FERC licenses can include specific fish passage requirements.	Exhibit_(WTR-2.1), p 127	None. Filings do not note any specific fish passage requirements.	NA	No	
c	Capital improvements for recreation facilities	FERC licenses frequently include specific recreational enhancement measures.	Exhibit_(WTR-2.1), p 128-130	None. Filings indicate the project is in compliance with license requirements for recreation.	NA	No	
d	Annual operating costs for environmental compliance (monitoring, etc)	Costs for license compliance are included in the annual O&M budget. Projected costs are based on historic costs.	Exhibit_(WTR-2.1), p 162, 168 Exhibit_(WTR-2.3), p 189 Exhibit__(JMS-1) and (JMS-2). Response to MCC-028 (2-4-14)	There is insufficient information to determine if the projected O&M budget is adequate to cover future compliance needs.	Develop line-item budget projections per compliance requirement with a contingency.	Yes	
2	**FERC Relicensing (future exposure)**	Projects must be relicensed every 30-50 years, depending on the terms of the existing license. The Thompson Falls license expires in 2025. Licensing proceedings typically begin at least 5 years prior to licence expiration.	Exhibit_(WTR-2.3), p 9	None. License issued on 9/27/00 and expires on 8/31/40.	NA	No	
3	**Endangered Species Act**						
a	Existing listings and requirements	There may be special requirements for the protection of existing rare, threatened or endangered species affected by the project.	Exhibit_(WTR-2.1), p 127	None. Existing license and MOU include measures intended to protect listed species.	NA	No	
b	Exposure for future listings	Future ESA listings could result in new requirements being imposed on the project to protect rare, threatened or endangered species.	Exhibit_(WTR-2.1), p 127	None. Filings do not note any known potential future ESA listings that would affect the Project.	NA	No	

No.	Item	Specific Issue	Source Document(s) *(Explicitly identify that part of the record that would indicate there is a potential problem)*	Describe the concern	Potential Remedy	Potential to incur significant costs (> $0.5 million) Yes or No	Other Comments
4	**EPA - Contamination and Super Fund Sites (human health and safety)**	Potential for contamination or other environmental health issues.	Exhibit_(WTR-2.1), Docket No. D2013.12.85, p 130 Exhibit_(WTR-2.3), Docket No. D2013.12.85, p 14 Response to PSC-031 Response to PSC-080 Response to MCC-067, 175, 199	Black Eagle has the potential to be within the boundary lines of the Anaconda Copper Mining (ACM) Smelter and Refinery Superfund Site. The full extent of the Superfund boundaries have not been delineated to this date and the potential impact to the Black Eagle dam is unknown until the delineation has been made. NWE included a one-time allowance in 2025 of $375,000 for response costs associated with contaminates sediments at Black Eagle. The Black Eagle site also contains several known areas of asbestos.	Establish contingency funds to address potential superfund issues and asbests management and/or abatement.	Yes	
5	**Historic Preservation and Tribal Issues**	FERC licenses often include specific measures to protect historic and cultural resources.	Exhibit_(WTR-2.1), Docket No. D2013.12.85, p 128	None. Filings indicate the project is in compliance with license requirements.	NA	No	
6	**Water Rights**	Licensees must maintain adequate land and water rights to operate and maintain the project.	Exhibit_(WTR-2.1), Docket No. D2013.12.85, p 125-26	None. Filings list water rights claims.	NA	No	

Project/Development/FERC ID			Year Built	License Expiration			
Missouri-Madison Project/Cochrane Development/FERC No. 2188-03			1958	8/31/2040			
No.	**Item**	**Specific Issue**	**Source Document(s)** ***(Explicitly identify that part of the record that would indicate there is a potential problem)***	**Describe the concern**	**Potential Remedy**	**Potential to incur significant costs (> $0.5 million) Yes or No**	**Other Comments**
1	**Water Retaining Structures (Spillways/Nonoverflows/Intakes/Intake-Powerhouses/Embankments)**						
a	Dam	[redacted] (PFM 1, Category I; PFM 13, Category III)	Exhibit__(WTR-5.2), pp 14,15,34,35,52	[redacted]	[redacted]	Yes	
2	**Appurtenances (Penstocks/Tunnels/Canals/Surge Tanks/Powerhouses/Tailraces)**						
a	Powerhouse	[redacted]	Exhibit__(WTR-5.2), p 74, 77	[redacted]	None anticipated	No	
3	**Safety**	[redacted]	Exhibit__(WTR-6.2), p 15	[redacted]	None anticipated	No	
4	**Security**	[redacted]	Exhibit__(WTR-6.2), p 15	[redacted]	None anticipated	No	

	Project/Development/FERC ID		Year Built	License Expiration			
	Missouri-Madison Project/Cochrane Development/FERC No. 2188-03		**1958**	**8/31/2040**			
No.	**Item**	**Specific Issue**	**Source Document(s)** ***(Explicitly identify that part of the record that would indicate there is a potential problem)***	**Describe the concern**	**Potential Remedy**	**Potential to incur significant costs (> $0.5 million) Yes or No**	**Other Comments**
1	Plant General Arrangement & 1-Line						
a	Back-up and Emergency Power	Back-up sources of electric power required in the event of an emergency or utility outage.	Emergency Action Plan (WTR-8.2)	None anticipated.	N/A	No.	[redacted]
b	Reliability (i.e., n-1 design service loss)	Impact of the loss of any one major component results in the loss of generation of one unit.	Document 7.7.3.41.7.2.2.1 41432-C1-1-0-1-Model and Response to PSC-179	None anticipated.	None. One spare transformer is available that can be used at Cochrane in the event of a failure.	No.	[redacted]
2	Interconnection & Transmission						
a	Power rating - normal configuration	Transmission System capability for evacuation of power from the plant with a normal system configuration.	No information available.	No detailed information from NW due diligence.	Unknown. Insufficient information regarding transmission system constraints.	Yes	System interconnection studies can determine power transfer capabilities under normal and contingency conditions.
b	Power rating - 1st contingency	Transmission System capability for evacuation of power from the plant under a 1st contingency condition.	No information available.	No detailed information from NW due diligence.		Yes	
3	Automation and Controls						
a	Exciter and Governor - WECC Compliance	Exciter and Governors conform to WECC requirements	Shaw Due Diligence Report (WTR-2.1)	No upgrades performed.	Upgrades planned for 2017	Yes	
b	Remote Monitoring & Control Capability	Plant operational from remote control center	Shaw Due Diligence Report (WTR-2.1)	None anticipated.	N/A	No.	Upgrades performed.
c	Automatic Controls and Protection	Control and protection systems designed for automatic operation.	Shaw Due Diligence Report (WTR-2.1)	None anticipated.	N/A	No.	Upgrades performed.
4	Main Step-up Transformers						
a	Age	Age is an indicator of the remaining useful life of a transformer.	Response to PSC-179	None anticipated.	Replacement of GSU.	Yes	100 MVA, 3-phase transformer installed in 2012
b	Loading History	Loading history is an indicator of the remaining useful life of a transformer.	Response to PSC-179	None anticipated.			Max. connected generator load is 60 MVA. Transformer loading within rated capacity.
c	Dissolved Gas Analysis (DGA) Test Data	Regular PM checks of dissolved gasses in the oil are an industry-accepted measure of the condition of a transformer.	Response to PSC-179	DGA meets Condition III, meaning that the TDCG in this range indicates high level of decomposition and needs additional investigation.			
5	Generators						
a	Stator Winding - Type and Age	The age and type of winding is an indicator of its remaining useful life.	Shaw Due Diligence Report (WTR-2.1)	None anticipated.	Unknown. Insufficient information regarding the generator condition.	Yes. No detailed information from NW due diligence report that machine parts will not need to be replaced before the scheduled date.	Generators were originally installed in 1958 and rewound in 2004 (U1) and 2005 (U2).
b	Windings Test Data - PI, Doble, etc.	Routine PM tests can measure the loss of insulation life and be indicators for a rewind.		No detailed information from NW due diligence.			
c	Rotor - inspection reports for fatigue & cracks, field windings	Metal fatigue can cause cracking in the rotor components and ultimately lead to a catastrophic failure		No detailed information from NW due diligence.	Replace rotor components.		

No.	Item	Specific Issue	Source Document(s) *(Explicitly identify that part of the record that would indicate there is a potential problem)*	Describe the concern	Potential Remedy	Potential to incur significant costs (> $0.5 million) Yes or No	Other Comments
d	Vibration data	Vibration monitoring can reveal mechanical problems in the gates, bearings and speed increasers (where applicable) that require repair.		No detailed information from NW due diligence.	Repair/replace bearings, gates.		

	Project/Development/FERC ID		Year Built	License Expiration			
	Missouri-Madison Project/Cochrane Development/FERC No. 2188-03		1958	8/31/2040			
No.	Item	Specific Issue	Source Document(s) *(Explicitly identify that part of the record that would indicate there is a potential problem)*	Describe the concern	Potential Remedy	Potential to incur significant costs (> $0.5 million) Yes or No	Other Comments
1	Auxillary mechanical systems						
a	Station dewatering	Keep submerged portions of the powerhouse structure and equipment dry.	None	No detailed information from NW due diligence.		Unknown	
b	HVAC	Maintain powerhouse ambient temperature within acceptable range.	None	No detailed information from NW due diligence.		Unknown	
c	Powerhouse crane	Lifting/rigging capability to support maintenace activities.	None	No detailed information from NW due diligence.		Unknown	
d	*Other (list)*						
2	Gates & Valves						
a	Penstock headgate	Means of stopping flow into the penstock and/or turbine.	WTR-2.1, page 72.				Headgate and draft tube gate seals planned to be replaced in 2015.
b	Unit dewatering gates/valves	Means of dewatering pressure case/draft tube to support maintenance activities.	None	No detailed information from NW due diligence.		Unknown	
c	HPU/accumulator	Hydraulic power to operate gates and valves.	None	No detailed information from NW due diligence.		Unknown	
d	*Other (list)*						
3	Governor System						
a	Full governor/gate actuator	Means of controlling wicket gates and water flow to the turbine runner.	WTR-2.1, page 72.	Original Equipment.	Governor upgrades planned for 2017.	No	
b	Accumulator/emergency close	Means of closing wicket gates/penstock headgates in the event of loss of station service.	None	No detailed information from NW due diligence.		Unknown	
c	*Other (list)*						
4	Turbines		WTR-2.1, page 72. PSC-066, attached CD, "Hydro Capital" tab.	Two Kaplan units. 1958 ISD. Original Equipment. "Generator-Turbine Upgrades" planned for 2024 & 2025. Insufficient data to confirm the adequacy of the proposed budget and schedule for the turbine overhauls.		Yes	
a	Bearings/alignment	Condition of wear surfaces, clearances,operating temperature, vibration and shaft alignment.	None	No detailed information from NW due diligence.		Unknown	
b	Pressure case	Structural integrity, metalurgical fatigue, ability to safely withstand normal and transient operating conditions.	None	No detailed information from NW due diligence.		Unknown	
c	Stay vanes & wicket gates	Condition, hydraulic profiles, wicket gate linkage and wicket gate pinch.	None	No detailed information from NW due diligence.		Unknown	
d	Runner	Structural integrity, cavitation damage, hydraulic profiles, metalurgical fatigue.	None	No detailed information from NW due diligence.		Unknown	
e	Seal clearances/Headcover pressure	Excessive seal clearances result in decreased performance and increased pressure on headcover.	None	No detailed information from NW due diligence.		Unknown	
f	Draft tube	Structural integrity, hydraulic profile, maintain suction head for runners set above tailwater.	None	No detailed information from NW due diligence.		Unknown	

	Project/Development/FERC ID		Year Built	License Expiration			
	Missouri-Madison Project/Cochrane Development/FERC No. 2188-03		1958	8/31/2040			
No.	Item	Specific Issue	Source Document(s) *(Explicitly identify that part of the record that would indicate there is a potential problem)*	Describe the concern	Potential Remedy	Potential to incur significant costs (> $0.5 million) Yes or No	Other Comments
1	**Compliance with FERC License Order**						
a	Environmental requirements and management plans (WQ, fish and wildlife, recreation, lands, etc). Are there any outstanding compliance issues?	FERC licenses typicaly include specific environmental protection, mitigation, and enhancement (PM&E) measures.	Exhibit_(WTR-2.1), p 141-142 Exhibit_(WTR-2.3), p 12	None. Filings indicate the project is in compliance with license requirements.	NA	No	
b	Fish passage requirements (capital and operational)	FERC licenses can include specific fish passage requirements.	Exhibit_(WTR-2.1), p 141	None. Filings do not note any specific fish passage requirements.	NA	No	
c	Capital improvements for recreation facilities	FERC licenses frequently include specific recreational enhancement measures.	Exhibit_(WTR-2.1), p 143-144	None. Filings indicate the project is in compliance with license requirements for recreation.	NA	No	
d	Annual operating costs for environmental compliance (monitoring, etc)	Costs for license compliance are included in the annual O&M budget. Projected costs are based on historic costs.	Exhibit_(WTR-2.1), p 162, 168 Exhibit_(WTR-2.3), p 189 Exhibit__(JMS-1) and (JMS-2). Response to MCC-028 (2-4-14)	There is insufficient information to determine if the projected O&M budget is adequate to cover future compliance needs.	Develop line-item budget projections per compliance requirement with a contingency.	Yes	
2	**FERC Relicensing (future exposure)**	Projects must be relicensed every 30-50 years, depending on the terms of the existing license. The Thompson Falls license expires in 2025. Licensing proceedings typically begin at least 5 years prior to licence expiration.	Exhibit_(WTR-2.3), p 9	None. License issued on 9/27/00 and expires on 8/31/40.	NA	No	
3	**Endangered Species Act**						
a	Existing listings and requirements	There may be special requirements for the protection of existing rare, threatened or endangered species affected by the project.	Exhibit_(WTR-2.1), p 142	None. Existing license and MOU include measures intended to protect listed species.	NA	No	
b	Exposure for future listings	Future ESA listings could result in new requirements being imposed on the project to protect rare, threatened or endangered species.	Exhibit_(WTR-2.1), p 142	None. Filings do not note any known potential future ESA listings that would affect the Project.	NA	No	
4	**EPA - Contamination and Super Fund Sites (human health and safety)**	Potential for contamination or other environmental health issues.	Exhibit_(WTR-2.1), p 139 - 140 Exhibit_(WTR-2.3), p 15	None. Filings do not indicate any significant known contamination issues.	NA	No	
5	**Historic Preservation and Tribal Issues**	FERC licenses often include specific measures to protect historic and cultural resources.	Exhibit_(WTR-2.1), p 143	None. Filings indicate the project is in compliance with license requirements.	NA	No	
6	**Water Rights**	Licensees must maintain adequate land and water rights to operate and maintain the project.	Exhibit_(WTR-2.1), p 140	None. Filings list water rights claims.	NA	No	

Project/Development/FERC ID			Year Built	License Expiration			
Missouri-Madison Project/Hauser Development/FERC No. 2188-07			1911	8/31/2040			
No.	**Item**	**Specific Issue**	**Source Document(s)** ***(Explicitly identify that part of the record that would indicate there is a potential problem)***	**Describe the concern**	**Potential Remedy**	**Potential to incur significant costs (> $0.5 million) Yes or No**	**Other Comments**
1	**Water Retaining Structures (Spillways/Nonoverflows/Intakes/Intake-Powerhouses/Embankments)**						
a	Spillway	[redacted] (PFM 5, Category II)	Exhibit__(WTR-5.3), pp 19, 29	[redacted]	[redacted]	Yes	
b	Spillway	[redacted] (Category IV PFMs 7, 10)	Exhibit__(WTR-5.3), pp 19, 24, 32, 36, 213	[redacted]	[redacted]	Yes	

No.	Item	Specific Issue	Source Document(s) *(Explicitly identify that part of the record that would indicate there is a potential problem)*	Describe the concern	Potential Remedy	Potential to incur significant costs (> $0.5 million) Yes or No	Other Comments
c	Dam	[redacted]	Exhibit__(WTR-5.3), pp 51,111,186,188; Exhibit__(WTR-6.3), pp 8, 9; Exhibit__(WTR-2.3), p 8	[redacted]	[redacted]	Yes	
2	**Appurtenances (Penstocks/Tunnels/Canals/Surge Tanks/Powerhouses/Tailraces)**						
a	Powerhouse	[redacted]	Exhibit__(WTR-5.3), p 53	[redacted]	None anticipated	No	
3	**Safety**	[redacted]	Exhibit__(WTR-6.3), p 14	[redacted]	None anticipated	No	
4	**Security**	[redacted]	Exhibit__(WTR-6.3), p 14	[redacted]	None anticipated	No	

	Project/Development/FERC ID		Year Built	License Expiration			
	Missouri-Madison Project/Hauser Development/FERC No. 2188-07		**1911**	**8/31/2040**			
No.	**Item**	**Specific Issue**	**Source Document(s)** ***(Explicitly identify that part of the record that would indicate there is a potential problem)***	**Describe the concern**	**Potential Remedy**	**Potential to incur significant costs (> $0.5 million) Yes or No**	**Other Comments**
1	Plant General Arrangement & 1-Line						
a	Back-up and Emergency Power	Back-up sources of electric power required in the event of an emergency or utility outage.	Emergency Action Plan (WTR-8.3)	None anticipated.	N/A	No	[redacted]
b	Reliability (i.e., n-1 design service loss)	Impact of the loss of any one major component results in the loss of generation of one unit.	Document 7.7.3.41.7.2.5.1 and Response to PSC-179.	[redacted]	[redacted]	Yes	
2	Interconnection & Transmission						
a	Power rating - normal configuration	Transmission System capability for evacuation of power from the plant with a normal system configuration.	No information available.	No detailed information from NW due diligence.	Unknown. Insufficient information regarding transmission system constraints.	Yes	System interconnection studies can determine power transfer capabilities under normal and contingency conditions.
b	Power rating - 1st contingency	Transmission System capability for evacuation of power from the plant under a 1st contingency condition.	No information available.	No detailed information from NW due diligence.		Yes	
3	Automation and Controls						
a	Exciter and Governor - WECC Compliance	Exciter and Governors conform to WECC requirements	Shaw Due Diligence Report (WTR-2.1)	None anticipated.	N/A	No	Governor and Exciter upgrades performed.
b	Remote Monitoring & Control Capability	Plant operational from remote control center	Shaw Due Diligence Report (WTR-2.1)	No upgrades performed.	Planned to begin in 2014.	Yes	
c	Automatic Controls and Protection	Control and protection systems designed for automatic operation.	Shaw Due Diligence Report (WTR-2.1)	No upgrades performed.	Planned to begin in 2014.	Yes	
4	Main Step-up Transformers						
a	Age	Age is an indicator of the remaining useful life of a transformer.	Response to PSC-179.	None anticipated	N/A	No	Two 12.5 MVA, 3-phase transformers installed in 2003.
b	Loading History	Loading history is an indicator of the remaining useful life of a transformer.	Response to PSC-179.	None anticipated			Max connected generator load is 9.35 MVA. Transformer loading within rated capacity.
c	Dissolved Gas Analysis (DGA) Test Data	Regular PM checks of dissolved gasses in the oil are an industry-accepted measure of the condition of a transformer.	Response to PSC-179.	None anticipated			DGA analysis rated Condition II per IEEE C57.104 indicating normal combustible gas level.
5	Generators						
a	Stator Winding - Type and Age	The age and type of winding is an indicator of its remaining useful life.	Shaw Due Diligence Report (WTR-2.1)	Generators were originally installed in 1911. Rewinds in 1959 (U1 & U3), 1963 (U2), 1949 (U5), 2006 (U6). Next projected rewinds (per PSC-066/Mustang Evaluation) are 2016-2021, (U1 thru U5).	Rewind generator.	Yes. No detailed information from NW due diligence report that machine parts will not need to be replaced before the scheduled	
b	Windings Test Data - PI, Doble, etc.	Routine PM tests can measure the loss of insulation life and be indicators for a rewind.		No detailed information from NW due diligence.			

No.	Item	Specific Issue	Source Document(s) *(Explicitly identify that part of the record that would indicate there is a potential problem)*	Describe the concern	Potential Remedy	Potential to incur significant costs (> $0.5 million) Yes or No	Other Comments
c	Rotor - inspection reports for fatigue & cracks, field windings	Metal fatigue can cause cracking in the rotor components and ultimately lead to a catastrophic failure		No detailed information from NW due diligence.	Replace rotor components.	date.	
d	Vibration data	Vibration monitoring can reveal mechanical problems in the gates, bearings and speed increasers (where applicable) that require repair.		No detailed information from NW due diligence.	Repair/replace bearings, gates.		

	Project/Development/FERC ID		Year Built	License Expiration			
	Missouri-Madison Project/Hauser Development/FERC No. 2188-07		**1911**	**8/31/2040**			
No.	**Item**	**Specific Issue**	**Source Document(s)** ***(Explicitly identify that part of the record that would indicate there is a potential problem)***	**Describe the concern**	**Potential Remedy**	**Potential to incur significant costs (> $0.5 million) Yes or No**	**Other Comments**
1	Auxillary mechanical systems						
a	Station dewatering	Keep submerged portions of the powerhouse structure and equipment dry.	None	No detailed information from NW due diligence.		Unknown	
b	HVAC	Maintain powerhouse ambient temperature within acceptable range.	None	No detailed information from NW due diligence.		Unknown	
c	Powerhouse crane	Lifting/rigging capability to support maintenace activities.	None	No detailed information from NW due diligence.		Unknown	
d	*Other (list)*						
2	Gates & Valves						
a	Penstock headgate	Means of stopping flow into the penstock and/or turbine.	None	No detailed information from NW due diligence.		Unknown	
b	Unit dewatering gates/valves	Means of dewatering pressure case/draft tube to support maintenance activities.	None	No detailed information from NW due diligence.		Unknown	
c	HPU/accumulator	Hydraulic power to operate gates and valves.	None	No detailed information from NW due diligence.		Unknown	
d	*Other (list)*						
3	Governor System						
a	Full governor/gate actuator	Means of controlling wicket gates and water flow to the turbine runner.	WTR-2.1, page 72.			Unknown	"Upgrades have been implemented." No other information available.
b	Accumulator/emergency close	Means of closing wicket gates/penstock headgates in the event of loss of station service.	None	No detailed information from NW due diligence.		Unknown	
c	*Other (list)*						
4	Turbines		WTR-2.1, page 72.	Six horizontal Francis units, 1911 ISD. Turbine/wicket gate rehabilitation scheduled for 2016 - 2012. Insufficient data to confirm the adequacy of the proposed budget and schedule for the turbine overhauls.		Yes	
a	Bearings/alignment	Condition of wear surfaces, clearances,operating temperature, vibration and shaft alignment.	None	No detailed information from NW due diligence.		Unknown	
b	Pressure case	Structural integrity, metalurgical fatigue, ability to safely withstand normal and transient operating conditions.	None	No detailed information from NW due diligence.		Unknown	
c	Stay vanes & wicket gates	Condition, hydraulic profiles, wicket gate linkage and wicket gate pinch.	WTR-2.1, page 72.	See Turbines, above.		Unknown	
d	Runner	Structural integrity, cavitation damage, hydraulic profiles, metalurgical fatigue.	WTR-2.1, page 72.	See Turbines, above.		Unknown	Unit 4 rear runner replaced. Date unknown.
e	Seal clearances/Headcover pressure	Excessive seal clearances result in decreased performance and increased pressure on headcover.	None	No detailed information from NW due diligence.		Unknown	
f	Draft tube	Structural integrity, hydraulic profile, maintain suction head for runners set above tailwater.	None	No detailed information from NW due diligence.		Unknown	

	Project/Development/FERC ID		Year Built	License Expiration			
	Missouri-Madison Project/Hauser Development/FERC No. 2188-07		**1911**	**8/31/2040**			
No.	**Item**	**Specific Issue**	**Source Document(s)** ***(Explicitly identify that part of the record that would indicate there is a potential problem)***	**Describe the concern**	**Potential Remedy**	**Potential to incur significant costs (> $0.5 million) Yes or No**	**Other Comments**
1	**Compliance with FERC License Order**						
a	Environmental requirements and management plans (WQ, fish and wildlife, recreation, lands, etc). Are there any outstanding compliance issues?	FERC licenses typicaly include specific environmental protection, mitigation, and enhancement (PM&E) measures.	Exhibit_(WTR-2.1), p 115-116 Exhibit_(WTR-2.3), p 12	None. Filings indicate the project is in compliance with license requirements.	NA	No	
b	Fish passage requirements (capital and operational)	FERC licenses can include specific fish passage requirements.	Exhibit_(WTR-2.1), p 115	None. Filings do not note any specific fish passage requirements.	NA	No	
c	Capital improvements for recreation facilities	FERC licenses frequently include specific recreational enhancement measures.	Exhibit_(WTR-2.1), p 117	None. Filings indicate the project is in compliance with license requirements for recreation.	NA	No	
d	Annual operating costs for environmental compliance (monitoring, etc)	Costs for license compliance are included in the annual O&M budget. Projected costs are based on historic costs.	Exhibit_(WTR-2.1), p 162, 168 Exhibit_(WTR-2.3), p 189 Exhibit__(JMS-1) and (JMS-2). Response to MCC-028 (2-4-14)	There is insufficient information to determine if the projected O&M budget is adequate to cover future compliance needs.	Develop line-item budget projections per compliance requirement with a contingency.	Yes	
2	**FERC Relicensing (future exposure)**	Projects must be relicensed every 30-50 years, depending on the terms of the existing license. The Thompson Falls license expires in 2025. Licensing proceedings typically begin at least 5 years prior to licence expiration.	Exhibit_(WTR-2.3), p 9	None. License issued on 9/27/00 and expires on 8/31/40.	None	No	
3	**Endangered Species Act**						
a	Existing listings and requirements	There may be special requirements for the protection of existing rare, threatened or endangered species affected by the project.	Exhibit_(WTR-2.1), p 116	None. Existing license and MOU include measures intended to protect listed species.	NA	No	
b	Exposure for future listings	Future ESA listings could result in new requirements being imposed on the project to protect rare, threatened or endangered species.	Exhibit_(WTR-2.1), p 116	None. Filings do not note any known potential future ESA listings that would affect the Project.	NA	No	
4	**EPA - Contamination and Super Fund Sites (human health and safety)**	Potential for contamination or other environmental health issues.	Exhibit_(WTR-2.1), p 112-113	None. Filings do not note any significant contamination issues.	NA	No	
5	**Historic Preservation and Tribal Issues**	FERC licenses often include specific measures to protect historic and cultural resources.	Exhibit_(WTR-2.1), p 114	None. Filings indicate the project is in compliance with license requirements.	NA	No	
6	**Water Rights**	Licensees must maintain adequate land and water rights to operate and maintain the project.	Exhibit_(WTR-2.1), p 108	None. Filings list water rights claims.	NA	No	

Project/Development/FERC ID			Year Built	License Expiration			
Missouri-Madison Project/Hebgen Development/FERC No. 2188-09			1915	8/31/2040			
No.	**Item**	**Specific Issue**	**Source Document(s) *(Explicitly identify that part of the record that would indicate there is a potential problem)***	**Describe the concern**	**Potential Remedy**	**Potential to incur significant costs (> $0.5 million) Yes or No**	**Other Comments**
Project/Development/FERC ID							
1	**Water Retaining Structures (Spillways/Nonoverflows/Intakes/Intake-Powerhouses/Embankments)**						
a	Spillway	[redacted]	Exh_(WTR-5.4), pp 34, 81, 513; Exhibit__(WTR-2.1), pp 34, 513 Exh_(WTR-6.4), pp 14	[redacted]	[redacted]	Yes	
b	Spillway	[redacted] (PFM 23, Category IV; PFM 45, Category II)	Exhibit__(WTR-5.4), pp 34, 64, 81, 511; Exhibit_(WTR-6.4), p 16	[redacted]	[redacted]	Yes	
2	**Appurtenances (Penstocks/Tunnels/Canals/Surge Tanks/Powerhouses/Tailraces)**						
a	Appurtenances - General	Structural condition, potential for deterioration.	Exhibit__(WTR-2.1), p 35	None. The appurtenant works all appear to be in compliance with FERC requirements. Except for the conduit liner described below.		No	
b	Outlet Conduit	[redacted]	Exhibit_(WTR-6.4), p 16; Exhibit__(WTR-2.1), p 182	[redacted]	[redacted]	NA	
3	**Public Safety**	[redacted]	Exhibit__(WTR-6.4), p 21	[redacted]	None anticipated	No	
4	**Security**	[redacted]	Exhibit__(WTR-6.4), p 21	[redacted]	None anticipated	No	

	Project/Development/FERC ID		Year Built	License Expiration			
	Missouri-Madison Project/Hebgen Development/FERC No. 2188-09		**1915**	**8/31/2040**			
No.	**Item**	**Specific Issue**	**Source Document(s)** ***(Explicitly identify that part of the record that would indicate there is a potential problem)***	**Describe the concern**	**Potential Remedy**	**Potential to incur significant costs (> $0.5 million) Yes or No**	**Other Comments**
1	Plant General Arrangement & 1-Line						
a	Back-up and Emergency Power	The Emergency Action Plan for the plant provides a thorough description of the sources for electrical power in the event of an emergency or utility outage.	Emergency Action Plan (WTR-8.4)	None anticipated.	N/A	No	
b	Reliability (i.e., n-1 design service loss)	-n/a-					
2	Interconnection & Transmission						
a	Power rating - normal configuration	-n/a-					
b	Power rating - 1st contingency	-n/a-					
3	Automation and Controls						
a	Exciter and Governor - WECC Compliance	-n/a-					
b	Remote Monitoring & Control Capability	-n/a-					
c	Automatic Controls and Protection	-n/a-					
4	Main Step-up Transformers						
a	Age	-n/a-					
b	Loading History	-n/a-					
c	Dissolved Gas Analysis (DGA) Test Data	-n/a-					
5	Generators						
a	Stator Winding - Type and Age	-n/a-					
b	Windings Test Data - PI, Doble, etc.	-n/a-					
c	Rotor - inspection reports for fatigue & cracks, field windings	-n/a-					
d	Vibration data	-n/a-					
e	Speed Increasers - age & operating hours	-n/a-					

	Project/Development/FERC ID		Year Built	License Expiration			
	Missouri-Madison Project/Hebgen Development/FERC No. 2188-09		1915	8/31/2040			
No.	Item	Specific Issue	Source Document(s) *(Explicitly identify that part of the record that would indicate there is a potential problem)*	Describe the concern	Potential Remedy	Potential to incur significant costs (> $0.5 million) Yes or No	Other Comments
1	Auxillary mechanical systems						
a	Station dewatering	-n/a-					
b	HVAC	-n/a-					
c	Powerhouse crane	-n/a-					
d	*Other (list)*						
2	Gates & Valves						
a	Penstock headgate	None. See Civil_Part 12, Item 11a		None			No
b	Unit dewatering gates/valves	None. See Civil_Part 12, Item 11a		None			No
c	HPU/accumulator	None. See Civil_Part 12, Item 11a		None			No
d	*Other (list)*						
3	Governor System						
a	Full governor/gate actuator	-n/a-					
b	Accumulator/emergency close	-n/a-					
c	*Other (list)*	-n/a-					
4	Turbines						
a	Bearings/alignment	-n/a-					
b	Pressure case	-n/a-					
c	Stay vanes & wicket gates	-n/a-					
d	Runner	-n/a-					
e	Seal clearances/Headcover pressure	-n/a-					
f	Draft tube	-n/a-					

	Project/Development/FERC ID		Year Built	License Expiration			
	Missouri-Madison Project/Hebgen Development/FERC No. 2188-09		**1915**	**8/31/2040**			
No.	**Item**	**Specific Issue**	**Source Document(s)** ***(Explicitly identify that part of the record that would indicate there is a potential problem)***	**Describe the concern**	**Potential Remedy**	**Potential to incur significant costs (> $0.5 million) Yes or No**	**Other Comments**
1	**Compliance with FERC License Order**						
a	Environmental requirements and management plans (WQ, fish and wildlife, recreation, lands, etc). Are there any outstanding compliance issues?	FERC licenses typicaly include specific environmental protection, mitigation, and enhancement (PM&E) measures.	Exhibit_(WTR-2.1), p 102-103 Exhibit_(WTR-2.3), p 12	None. Filings indicate the project is in compliance with license requirements.	NA	No	
b	Fish passage requirements (capital and operational)	FERC licenses can include specific fish passage requirements.	Exhibit_(WTR-2.1), p 102-103	None. Filings to not note any specific fish passage requirements.	NA	No	
c	Capital improvements for recreation facilities	FERC licenses frequently include specific recreational enhancement measures.	Exhibit_(WTR-2.1), p 89	None. Filings indicate the project is in compliance with license requirements for recreation.	NA	No	
d	Annual operating costs for environmental compliance (monitoring, etc)	Costs for license compliance are included in the annual O&M budget. Projected costs are based on historic costs.	Exhibit_(WTR-2.1), p 162, 168 Exhibit_(WTR-2.3), p 189 Exhibit__(JMS-1) and (JMS-2). Response to MCC-028 (2-4-14)	There is insufficient information to determine if the projected O&M budget is adequate to cover future compliance needs.	Develop line-item budget projections per compliance requirement with a contingency.	Yes	
2	**FERC Relicensing (future exposure)**	Projects must be relicensed every 30-50 years, depending on the terms of the existing license. The Thompson Falls license expires in 2025. Licensing proceedings typically begin at least 5 years prior to licence expiration.	Exhibit_(WTR-2.3), p 9	None. License issued on 9/27/00 and expires on 8/31/40.	NA	No	
3	**Endangered Species Act**						
a	Existing listings and requirements	There may be special requirements for the protection of existing rare, threatened or endangered species affected by the project.	Exhibit_(WTR-2.1), p 103-104	None. Existing license and MOU include measures intended to protect listed species.	NA	No	
b	Exposure for future listings	Future ESA listings could result in new requirements being imposed on the project to protect rare, threatened or endangered species.	Exhibit_(WTR-2.3), p 12 Response to PSC-031, 190, 191 Response to MCC-198	Filings indicate that potetnial future listing of Artic Grayling could result in unexpected costs, however potential listing, timing, and requirements are uncertain.	Establish contingency fund	Yes	
4	**EPA - Contamination and Super Fund Sites (human health and safety)**	Potential for contamination or other environmental health issues.	Exhibit_(WTR-2.1), p 101	None. Filings do not note any known significant contamination issues.	NA	No	
5	**Historic Preservation and Tribal Issues**	FERC licenses often include specific measures to protect historic and cultural resources.	Exhibit_(WTR-2.1), p 102 Exhibit_(WTR-2.3), p 10-11	None. Filings indicate the project is in compliance with license requirements.	NA	No	
6	**Water Rights**	Licensees must maintain adequate land and water rights to operate and maintain the project.	Exhibit_(WTR-2.1), p 102	None. Filings list water rights claims.	NA	No	

Project/Development/FERC ID			Year Built	License Expiration			
Missouri-Madison Project/Holter Development/FERC No. 2188-07			1911	8/31/2040			
No.	**Item**	**Specific Issue**	**Source Document(s)** ***(Explicitly identify that part of the record that would indicate there is a potential problem)***	**Describe the concern**	**Potential Remedy**	**Potential to incur significant costs (> $0.5 million) Yes or No**	**Other Comments**
Project/Development/FERC ID							
1	**Water Retaining Structures (Spillways/Nonoverflows/Intakes/Intake-Powerhouses/Embankments)**						
a	Left Nonoverflow Structure	(PFM 1, Category II)	Exhibit__(WTR-5.5), pp 20, 26-28			Yes	
b	Spillway	(Category II PFMs 7, 9; PFM 11, Categolry III; PFM 13, Category IV)	Exhibit__(WTR-5.5), pp 18, 22, 30-33, 37, 38; Exhibit__(WTR-6.5), pp 5, 6			Yes	
2	**Appurtenances (Penstocks/Tunnels/Canals/Surge Tanks/Powerhouses/Tailraces)**						
a	Powerhouse		Exhibit__(WTR-5.5), pp 55-58		None anticipated	No	
3	**Public Safety**		Exhibit__(WTR-6.5), p 16		None anticipated	No	
4	**Security**		Exhibit__(WTR-6.5), p 17		None anticipated	No	

	Project/Development/FERC ID		Year Built	License Expiration		License Expiration	
	Missouri-Madison Project/Holter Development/FERC No. 2188-07		1911	8/31/2040			
No.	**Item**	**Specific Issue**	**Source Document(s) *(Explicitly identify that part of the record that would indicate there is a potential problem)***	**Describe the concern**	**Potential Remedy**	**Potential to incur significant costs (> $0.5 million) Yes or No**	**Other Comments**
1	Plant General Arrangement & 1-Line						
a	Back-up and Emergency Power	Back-up sources of electric power required in the event of an emergency or utility outage.	Emergency Action Plan (WTR-8.5)	None anticipated.	N/A	No	[redacted]
b	Reliability (i.e., n-1 design service loss)	Impact of the loss of any one major component results in the loss of generation of one unit.	Document 7.7.3.41.7.2.6.1 Appendix G4 and Response to PSC-179	None anticipated.	N/A	No	[redacted]
2	Interconnection & Transmission						
a	Power rating - normal configuration	Transmission System capability for evacuation of power from the plant with a normal system configuration.	No information available.	No detailed information from NW due diligence.	Unknown. Insufficient information regarding transmission system constraints.	Yes	System interconnection studies can determine power transfer capabilities under normal and contingency conditions.
b	Power rating - 1st contingency	Transmission System capability for evacuation of power from the plant under a 1st contingency condition.	No information available.	No detailed information from NW due diligence.		Yes	
3	Automation and Controls						
a	Exciter and Governor - WECC Compliance	Exciter and Governors conform to WECC requirements	Shaw Due Diligence Report (WTR-2.1)	None anticipated.	N/A	No	Governor and Exciter upgrades performed.
b	Remote Monitoring & Control Capability	Plant operational from remote control center	Shaw Due Diligence Report (WTR-2.1)	None anticipated.	N/A	No	Upgrades performed.
c	Automatic Controls and Protection	Control and protection systems designed for automatic operation.	Shaw Due Diligence Report (WTR-2.1)	None anticipated.	N/A	No	Upgrades performed.
4	Main Step-up Transformers						
a	Age	Age is an indicator of the remaining useful life of a transformer.	Response to PSC-179	None anticipated.	Replacement of GSU.	Yes	Four 20 MVA, 3-phase transformers installed in 1990 & 1991
b	Loading History	Loading history is an indicator of the remaining useful life of a transformer.	Response to PSC-179	None anticipated.			Max connected generator load is 12 MVA. Transformer loading within rated capacity.
c	Dissolved Gas Analysis (DGA) Test Data	Regular PM checks of dissolved gasses in the oil are an industry-accepted measure of the condition of a transformer.	Response to PSC-179	Three of four transformer DGA meets Condition III, meaning that the TDCG in this range indicates high level of decomposition and needs additional investigation. Fourth transformer is Normal (Condition II).			

No.	Item	Specific Issue	Source Document(s) *(Explicitly identify that part of the record that would indicate there is a potential problem)*	Describe the concern	Potential Remedy	Potential to incur significant costs (> $0.5 million) Yes or No	Other Comments
5	Generators						
a	Stator Winding - Type and Age	The age and type of winding is an indicator of its remaining useful life.	Shaw Due Diligence Report (WTR-2.1)	Generators were originally installed in 1918 and last rewound in 1962(U2&3) and 1964 (U1 &4). Next projected rewinds (per PSC-066/Mustang Evaluation) are 2023 - 2026 (U1 thru U4).	Rewind generator.	Yes. No detailed information from NW due diligence report that machine parts will not need to be replaced before the scheduled date.	
b	Windings Test Data - PI, Doble, etc.	Routine PM tests can measure the loss of insulation life and be indicators for a rewind.		No detailed information from NW due diligence.			
c	Rotor - inspection reports for fatigue & cracks, field windings	Metal fatigue can cause cracking in the rotor components and ultimately lead to a catastrophic failure		No detailed information from NW due diligence.	Replace rotor components.		
d	Vibration data	Vibration monitoring can reveal mechanical problems in the gates, bearings and speed increasers (where applicable) that require repair.		No detailed information from NW due diligence.	Repair/replace bearings, gates.		

	Project/Development/FERC ID		Year Built	License Expiration			
	Missouri-Madison Project/Holter Development/FERC No. 2188-07		1911	8/31/2040			
No.	Item	Specific Issue	Source Document(s) *(Explicitly identify that part of the record that would indicate there is a potential problem)*	Describe the concern	Potential Remedy	Potential to incur significant costs (> $0.5 million) Yes or No	Other Comments
1	Auxillary mechanical systems						
a	Station dewatering	Keep submerged portions of the powerhouse structure and equipment dry.	None	No detailed information from NW due diligence.		Unknown	
b	HVAC	Maintain powerhouse ambient temperature within acceptable range.	None	No detailed information from NW due diligence.		Unknown	
c	Powerhouse crane	Lifting/rigging capability to support maintenace activities.	None	No detailed information from NW due diligence.		Unknown	
d	*Other (list)*						
2	Gates & Valves						
a	Penstock headgate	Means of stopping flow into the penstock and/or turbine.	None	No detailed information from NW due diligence.		Unknown	
b	Unit dewatering gates/valves	Means of dewatering pressure case/draft tube to support maintenance activities.	None	No detailed information from NW due diligence.		Unknown	
c	HPU/accumulator	Hydraulic power to operate gates and valves.	None	No detailed information from NW due diligence.		Unknown	
d	*Other (list)*						
3	Governor System						
a	Full governor/gate actuator	Means of controlling wicket gates and water flow to the turbine runner.	WTR-2.1, page 72.			Unknown	Governor upgades "have been implemented". No other detailed information available.
b	Accumulator/emergency close	Means of closing wicket gates/penstock headgates in the event of loss of station service.	None	No detailed information from NW due diligence.		Unknown	
c	*Other (list)*						
4	Turbines		WTR-2.1, page 72. PSC-066, attached CD, "Hydro Capital" tab.	Four Francis units. 1918 ISD. Original Equipment. "Turbine-Generator" upgrades planned for 2023-2026. Insufficient data to confirm the adequacy of the proposed budget and schedule for the turbine overhauls.		Yes	
a	Bearings/alignment	Condition of wear surfaces, clearances,operating temperature, vibration and shaft alignment.	None	No detailed information from NW due diligence.		Unknown	
b	Pressure case	Structural integrity, metalurgical fatigue, ability to safely withstand normal and transient operating conditions.	None	No detailed information from NW due diligence.		Unknown	
c	Stay vanes & wicket gates	Condition, hydraulic profiles, wicket gate linkage and wicket gate pinch.	None	No detailed information from NW due diligence.		Unknown	
d	Runner	Structural integrity, cavitation damage, hydraulic profiles, metalurgical fatigue.	None	No detailed information from NW due diligence.		Unknown	
e	Seal clearances/Headcover pressure	Excessive seal clearances result in decreased performance and increased pressure on headcover.	None	No detailed information from NW due diligence.		Unknown	
f	Draft tube	Structural integrity, hydraulic profile, maintain suction head for runners set above tailwater.	None	No detailed information from NW due diligence.		Unknown	

	Project/Development/FERC ID		Year Built	License Expiration			
	Missouri-Madison Project/Holter Development/FERC No. 2188-07		**1911**	**8/31/2040**			
No.	**Item**	**Specific Issue**	**Source Document(s)** ***(Explicitly identify that part of the record that would indicate there is a potential problem)***	**Describe the concern**	**Potential Remedy**	**Potential to incur significant costs (> $0.5 million) Yes or No**	**Other Comments**
1	**Compliance with FERC License Order**						
a	Environmental requirements and management plans (WQ, fish and wildlife, recreation, lands, etc). Are there any outstanding compliance issues?	FERC licenses typicaly include specific environmental protection, mitigation, and enhancement (PM&E) measures.	Exhibit_(WTR-2.1), p 121-122 Exhibit_(WTR-2.3), p 12	None. Filings indicate the project is in compliance with license requirements.	NA	No	
b	Fish passage requirements (capital and operational)	FERC licenses can include specific fish passage requirements.	Exhibit_(WTR-2.1), p 121	None. Filings do not note any specific fish passage requirements.	NA	No	
c	Capital improvements for recreation facilities	FERC licenses frequently include specific recreational enhancement measures.	Exhibit_(WTR-2.1), p 122	None. Filings indicate the project is in compliance with license requirements for recreation.	NA	No	
d	Annual operating costs for environmental compliance (monitoring, etc)	Costs for license compliance are included in the annual O&M budget. Projected costs are based on historic costs.	Exhibit_(WTR-2.1), pp 162, 168, 189; Exhibit__(JMS-1) and (JMS-2); Response to MCC-028 (2-4-14)	There is insufficient information to determine if the projected O&M budget is adequate to cover future compliance needs.	Develop line-item budget projections per compliance requirement with a contingency.	Yes	
2	**FERC Relicensing (future exposure)**	Projects must be relicensed every 30-50 years, depending on the terms of the existing license. The Thompson Falls license expires in 2025. Licensing proceedings typically begin at least 5 years prior to licence expiration.	Exhibit_(WTR-2.3), p 9	None. License issued on 9/27/00 and expires on 8/31/40.	NA	No	
3	**Endangered Species Act**						
a	Existing listings and requirements	There may be special requirements for the protection of existing rare, threatened or endangered species affected by the project.	Exhibit_(WTR-2.1), p 121	None. Existing license and MOU include measures intended to protect listed species.	NA	No	
b	Exposure for future listings	Future ESA listings could result in new requirements being imposed on the project to protect rare, threatened or endangered species.	Exhibit_(WTR-2.1), p 121	None. Filings do not note any known potential future ESA listings that would affect the Project.	NA	No	
4	**EPA - Contamination and Super Fund Sites (human health and safety)**	Potential for contamination or other environmental health issues.	Exhibit_(WTR-2.1), p 112-113 Exhibit_(WTR-2.3), p 14	Filings describe describes potential PCB contaminated oil from at the Holter Project.	Further characterize potential contamination and proposed clean-up.	Yes	
5	**Historic Preservation and Tribal Issues**	FERC licenses often include specific measures to protect historic and cultural resources.	Exhibit_(WTR-2.1), p 122	None. Filings indicate the project is in compliance with license requirements.	NA	No	
6	**Water Rights**	Licensees must maintain adequate land and water rights to operate and maintain the project.	Exhibit_(WTR-2.1), p 120	None. Filings list water rights claims.	NA	No	

Project/Development/FERC ID			Year Built	License Expiration			
	Kerr Project/FERC No. 0005		1938	9/4/2035			
No.	Item	Specific Issue	Source Document(s) *(Explicitly identify that part of the record that would indicate there is a potential problem)*	Describe the concern	Potential Remedy	Potential to incur significant costs (> $0.5 million) Yes or No	Other Comments
1	**Water Retaining Structures (Spillways/Nonoverflows/Intakes/Intake-Powerhouses/Embankments)**						
a	Right Nonoverflow	[redacted] (Category II PFMs 7, 8)	Exhibit__(WTR-5.6), pp 28,115; Exhibit__(WTR-2.1), p 28	[redacted]	[redacted]	Yes	Cost to [redacted] could be less than $0.5 MM; but when combined with similar remedial work on other projects the cost could well exceed $0.5MM.
b	Arch Dam, Right Nonoverflow, Right Embankment	[redacted]	Exhibit__(WTR-5.6), p 7; Exhibit__(WTR-2.3) p 9	[redacted]	[redacted]	Yes	
2	**Appurtenances (Penstocks/Tunnels/Canals/Surge Tanks/Powerhouses/Tailraces)**						
a	Powerhouse	[redacted]	Exhibit__(WTR-5.6), p 42	[redacted]	None anticipated	No	
3	**Public Safety**	[redacted]	Exhibit__(WTR-6.6), p 14	[redacted]	None anticipated	No	
4	**Security**	[redacted]	Exhibit__(WTR-6.6), p 14	[redacted]	None anticipated	No	

	Project/Development/FERC ID		Year Built	License Expiration			
	Kerr Project/FERC No. 0005		1938	09/04/35			
No.	**Item**	**Specific Issue**	**Source Document(s)** ***(Explicitly identify that part of the record that would indicate there is a potential problem)***	**Describe the concern**	**Potential Remedy**	**Potential to incur significant costs (> $0.5 million) Yes or No**	**Other Comments**
1	Plant General Arrangement & 1-Line						
a	Back-up and Emergency Power	Back-up sources of electric power required in the event of an emergency or utility outage.	Emergency Action Plan (WTR-8.6)	None anticipated.	N/A	No	[redacted]
b	Reliability (i.e., n-1 design service loss)	Impact of the loss of any one major component results in the loss of generation of one unit.	Document 7.7.3.41.7.2.7.1 41479-C1-3-0-1 Model and Response to PSC-179	None anticipated.	N/A	No	[redacted]
2	Interconnection & Transmission						
a	Power rating - normal configuration	Transmission System capability for evacuation of power from the plant with a normal system configuration.	Emergency Action Plan (WTR-8.6)	[redacted]	Unknown. Insufficient information regarding transmission system constraints to make a judgement as to its remedy.	None anticipated. Insofar as the project is being transferred, the remedy should be the responsbility of the new owner.	System interconnection studies can determine power transfer capabilities under normal and contingency conditions.
b	Power rating - 1st contingency	Transmission System capability for evacuation of power from the plant under a 1st contingency condition.	No information available.	Ability of the plant to continue operation under utility system contingencies.	Unknown. Insufficient information regarding the constraint to make a judgement as to its remedy.		
3	Automation and Controls						
a	Exciter and Governor - WECC Compliance	Exciter and Governors conform to WECC requirements	Shaw Due Diligence Report (WTR-2.1)	Upgrades not performed.	Perform upgrades.	None anticipated. Insofar as the project is being transferred, the remedy should be the responsbility of the new owner.	
b	Remote Monitoring & Control Capability	Plant operational from remote control center	Shaw Due Diligence Report (WTR-2.1)	Upgrades not performed.			
c	Automatic Controls and Protection	Control and protection systems designed for automatic operation.	Shaw Due Diligence Report (WTR-2.1)	None anticipated.	N/A	Upgrades performed	

No.	Item	Specific Issue	Source Document(s) *(Explicitly identify that part of the record that would indicate there is a potential problem)*	Describe the concern	Potential Remedy	Potential to incur significant costs (> $0.5 million) Yes or No	Other Comments
4	Main Step-up Transformers						
a	Age	Age is an indicator of the remaining useful life of a transformer.	Response to PSC-179	None anticipated	Replacement of No. 3 GSU.	None anticipated. Insofar as the project is being transferred, the remedy should be the responsbility of the new owner.	Three 95.2 MVA, 3-phase transformers installed in 1987 (U1), 1995 (U2) and 1988 (U3)
b	Loading History	Loading history is an indicator of the remaining useful life of a transformer.	Response to PSC-179	None anticipated			Max connected generator load is 80.16 MVA connected to TR3. Transformer loading is within rated capacity.
c	Dissolved Gas Analysis (DGA) Test Data	Regular PM checks of dissolved gasses in the oil are an industry-accepted measure of the condition of a transformer.	Response to PSC-179	Only Transformer 3 DGA meets Condition III, meaning that the TDCG in this range indicates high level of decomposition and needs additional investigation. Transformers 1 and 2 are listed "Good".			
5	Generators						
a	Stator Winding - Type and Age	The age and type of winding is an indicator of its remaining useful life.	Shaw Due Diligence Report (WTR-2.1)	Rewinds performed in 1977 (U2), 1995 (U3), 2003 (U1)	Rewind Generator.	None anticipated. Insofar as the project is being transferred, the remedy should be the responsbility of the new owner.	
b	Windings Test Data - PI, Doble, etc.	Routine PM tests can measure the loss of insulation life and be indicators for a rewind.		No detailed information from NW due diligence.			
c	Rotor - inspection reports for fatigue & cracks, field windings	Metal fatigue can cause cracking in the rotor components and ultimately lead to a catastrophic failure		No detailed information from NW due diligence.	Replace rotor components.		
d	Vibration data	Vibration monitoring can reveal mechanical problems in the gates, bearings and speed increasers (where applicable) that require repair.		No detailed information from NW due diligence.	Repair/replace bearings, gates.		

	Project/Development/FERC ID		Year Built	License Expiration			
	Kerr Project/FERC No. 0005		1938	09/04/35			
No.	Item	Specific Issue	Source Document(s) *(Explicitly identify that part of the record that would indicate there is a potential problem)*	Describe the concern	Potential Remedy	Potential to incur significant costs (> $0.5 million) Yes or No	Other Comments
1	Auxillary mechanical systems						
a	Station dewatering	Keep submerged portions of the powerhouse structure and equipment dry.	None	No detailed information from NW due diligence.		Unknown	
b	HVAC	Maintain powerhouse ambient temperature within acceptable range.	None	No detailed information from NW due diligence.		Unknown	
c	Powerhouse crane	Lifting/rigging capability to support maintenace activities.	None	No detailed information from NW due diligence.		Unknown	
d	*Other (list)*						
2	Gates & Valves						
a	Penstock headgate	Means of stopping flow into the penstock and/or turbine.	None	No detailed information from NW due diligence.		Unknown	
b	Unit dewatering gates/valves	Means of dewatering pressure case/draft tube to support maintenance activities.	None	No detailed information from NW due diligence.		Unknown	
c	HPU/accumulator	Hydraulic power to operate gates and valves.	None	No detailed information from NW due diligence.		Unknown	
d	*Other (list)*						
3	Governor System						
a	Full governor/gate actuator	Means of controlling wicket gates and water flow to the turbine runner.	WTR-2.1, page 75.	Original equipment.		Unknown	
b	Accumulator/emergency close	Means of closing wicket gates/penstock headgates in the event of loss of station service.				Unknown	
c	*Other (list)*						
4	Turbines		WTR-2.1, page 71.	Original equipment.		Unknown	Three vertical Francis units; In-service dates of 1938, 1948 & 1954, respectively.
a	Bearings/alignment	Condition of wear surfaces, clearances,operating temperature, vibration and shaft alignment.	None	No detailed information from NW due diligence.		Unknown	
b	Pressure case	Structural integrity, metalurgical fatigue, ability to safely withstand normal and transient operating conditions.	None	No detailed information from NW due diligence.		Unknown	
c	Stay vanes & wicket gates	Condition, hydraulic profiles, wicket gate linkage and wicket gate pinch.	None	No detailed information from NW due diligence.		Unknown	
d	Runner	Structural integrity, cavitation damage, hydraulic profiles, metalurgical fatigue.	WTR-2.1, page 71	Unit 3 runner, the newest runner was replaced in 2007. No other information on the reason for or the scope of runner replacement. No detailed information on Units 1 & 2.		Unknown	
e	Seal clearances/Headcover pressure	Excessive seal clearances result in decreased performance and increased pressure on headcover.	None	No detailed information from NW due diligence.		Unknown	
f	Draft tube	Structural integrity, hydraulic profile, maintain suction head for runners set above tailwater.	None	No detailed information from NW due diligence.		Unknown	

	Project/Development/FERC ID		Year Built	License Expiration			
	Kerr Project/FERC No. 0005		1938	9/4/2035			
No.	Item	Specific Issue	Source Document(s) *(Explicitly identify that part of the record that would indicate there is a potential problem)*	Describe the concern	Potential Remedy	Potential to incur significant costs (> $0.5 million) Yes or No	Other Comments
1	**Compliance with FERC License Order**						
a	Environmental requirements and management plans (WQ, fish and wildlife, recreation, lands, etc). Are there any outstanding compliance issues?	FERC licenses typically include specific environmental protection, mitigation, and enhancement (PM&E) measures.	Exhibit_(WTR-2.1), p 98 Exhibit_(WTR-2.3), p 12	There is insufficient information to determine if the project is in compliance.	NA	No	
b	Fish passage requirements (capital and operational)	FERC licenses can include specific fish passage requirements.	Exhibit_(WTR-2.1), p 98	None. Filings to not note any specific fish passage requirements.	NA	No	
c	Capital improvements for recreation facilities	FERC licenses frequently include specific recreational enhancement measures.	Exhibit_(WTR-2.1), p 98-99	None. Filings indicate the project is in compliance with license requirements for recreation.	NA	No	
d	Annual operating costs for environmental compliance (monitoring, etc)	Costs for license compliance are included in the annual O&M budget. Projected costs are based on historic costs and the assumption that the Kerr Project will be aquired by CSKT.	Exhibit_(WTR-2.1), p 162, 168 Exhibit_(WTR-2.3), p 189 Exhibit__(JMS-1) and (JMS-2). Response to MCC-028 (2-4-14) Response to PSC-031, 183 Response to MCC-161, 190	There is insufficient information to determine if the projected O&M budget is adequate to cover future compliance needs. If the Kerr project is not sold, annual O&M costs would be higher than projected.	Develop line-item budget projections per compliance requirement with a contingency. Examine scenarios with and withour Kerr sale.	Yes	
2	**FERC Relicensing (future exposure)**	Projects must be relicensed every 30-50 years, depending on the terms of the existing license. The Thompson Falls license expires in 2025. Licensing proceedings typically begin at least 5 years prior to licence expiration.	Exhibit_(WTR-2.3), p 9	None. License issued on 7/17/85 and expires on 9/04/35.	NA	No	
3	**Endangered Species Act**						
a	Existing listings and requirements	There may be special requirements for the protection of existing rare, threatened or endangered species affected by the project.	Exhibit_(WTR-2.1), p 98	Compliance with 2000 USFWS permit for incidental take of Bull trout is required. There is insufficient information to determine if the project is in compliance. It's uncertian if additional measures may be required in the future.	Document status of compliance	Yes	
b	Exposure for future listings	Future ESA listings could result in new requirements being imposed on the project to protect rare, threatened or endangered species.	Exhibit_(WTR-2.1), p 98	None. Filings do not note any known potential future ESA listings that would affect the Project.	NA	No	
4	**EPA - Contamination and Super Fund Sites (human health and safety)**	Potential for contamination or other environmental health issues.	Exhibit_(WTR-2.3), p 13	None. Filings do not note any known significant contamination issues.	NA	No	
5	**Historic Preservation and Tribal Issues**	FERC licenses often include specific measures to protect historic and cultural resources.	Exhibit_(WTR-2.1), p 89	There is insufficient information to determine if the project is in compliance.	Document status of compliance	No	

No.	Item	Specific Issue	Source Document(s) *(Explicitly identify that part of the record that would indicate there is a potential problem)*	Describe the concern	Potential Remedy	Potential to incur significant costs (> $0.5 million) Yes or No	Other Comments
6	**Water Rights**	Licensees must maintain adequate land and water rights to operate and maintain the project.	Exhibit_(WTR-2.1), p 97	None. Filings list water rights claims.	NA	No	

Project/Development/FERC ID			Year Built	License Expiration			
Missouri-Madison Project/Madison Development/FERC No. 2188-08			1905-1906	8/31/2040			
No.	Item	Specific Issue	Source Document(s) *(Explicitly identify that part of the record that would indicate there is a potential problem)*	Describe the concern	Potential Remedy	Potential to incur significant costs (> $0.5 million) Yes or No	Other Comments
Project/Development/FERC ID							
1	Water Retaining Structures (Spillways/Nonoverflows/Intakes/Intake-Powerhouses/Embankments)						
a	Spillway, Right Nonoverflow Structure	[redacted]	Exhibit__(WTR-5.7), p 62	[redacted]	[redacted]	Yes	
b	Spillway	[redacted] (Category IV PFMs 5, 7)	Exhibit__(WTR-5.7), p 25; Exhibit__(WTR-6.7), p 10	[redacted]	[redacted]	Yes	
c	Spillway	[redacted] (PFM 2, Category II)	Exhibit__(WTR-5.7), pp 29, 45, 62; Exhibit__(WTR-6.7), p 5	[redacted]	[redacted]	Yes	

No.	Item	Specific Issue	Source Document(s) *(Explicitly identify that part of the record that would indicate there is a potential problem)*	Describe the concern	Potential Remedy	Potential to incur significant costs (> $0.5 million) Yes or No	Other Comments
2	**Appurtenances (Penstocks/Tunnels/Canals/Surge Tanks/Powerhouses/Tailraces)**						
a	Flowline/Penstocks	Rockfalls	Exhibit__(WTR-2.3), p 20;	About 1-mile long flowline-penstock conveyance	Scaling loose rocks, reinforcing rock	Yes	
3	**Public Safety**	[redacted]	Exhibit__(WTR-6.7), p 16	[redacted]	None anticipated	No	
4	**Security**	[redacted]	Exhibit__(WTR-6.7), p 17	[redacted]	None anticipated	No	

	Project/Development/FERC ID		Year Built	License Expiration		License Expiration	
	Missouri-Madison Project/Madison Development/FERC No. 2188-08		1905-1906	8/31/2040			
No.	Item	Specific Issue	Source Document(s) *(Explicitly identify that part of the record that would indicate there is a potential problem)*	Describe the concern	Potential Remedy	Potential to incur significant costs (> $0.5 million) Yes or No	Other Comments
1	Plant General Arrangement & 1-Line						
a	Back-up and Emergency Power	Back-up sources of electric power required in the event of an emergency or utility outage.	Emergency Action Plan (WTR-8.7)	None anticipated.	N/A	No.	[redacted]
b	Reliability (i.e., n-1 design service loss)	Impact of the loss of any one major component results in the loss of generation of one unit.	Response to PSC-179	None anticipated.	N/A	No.	Four 2.25 MW generators connected to a single 12.5 MVA GSU. Loss of one GSU or HV connection will result in the loss of generation from 4 units.
2	Interconnection & Transmission						
a	Power rating - normal configuration	Transmission System capability for evacuation of power from the plant with a normal system configuration.	No information available.	No detailed information from NW due diligence.	Unknown. Insufficient information regarding transmission system constraints.	Yes	System interconnection studies can determine power transfer capabilities under normal and contingency conditions.
b	Power rating - 1st contingency	Transmission System capability for evacuation of power from the plant under a 1st contingency condition.	No information available.	No detailed information from NW due diligence.		Yes	
3	Automation and Controls						
a	Exciter and Governor - WECC Compliance	Exciter and Governors conform to WECC requirements	Shaw Due Diligence Report (WTR-2.1)	None anticipated.	N/A	No	Governor and Exciter upgrades performed.
b	Remote Monitoring & Control Capability	Plant operational from remote control center	Shaw Due Diligence Report (WTR-2.1)	None anticipated.	N/A	No	Upgrades performed.
c	Automatic Controls and Protection	Control and protection systems designed for automatic operation.	Shaw Due Diligence Report (WTR-2.1)	No upgrades performed.	Planned to begin in 2014.	No	
4	Main Step-up Transformers						
a	Age	Age is an indicator of the remaining useful life of a transformer.	Response to PSC-179	None anticipated.	Replacement of GSU.	Yes	12.5 MVA, 3-phase transformer installed in 1999
b	Loading History	Loading history is an indicator of the remaining useful life of a transformer.	Response to PSC-179	None anticipated.			A total of 9 MW is connected to a single 12.5 MVA transformer. Transformer loading is within rated capacity.
c	Dissolved Gas Analysis (DGA) Test Data	Regular PM checks of dissolved gasses in the oil are an industry-accepted measure of the condition of a transformer.	Response to PSC-179	DGA meets Condition III, meaning that the TDCG in this range indicates high level of decomposition and needs additional investigation.			
5	Generators						
a	Stator Winding - Type and Age	The age and type of winding is an indicator of its remaining useful life.	Shaw Due Diligence Report (WTR-2.1)	Generators were originally installed in 1906. Rewinds in 1938, 1964, 1965 and 2009. Windings on 2 of the machines exceed 50 years. Next projected rewinds (per PSC-066/Mustang Evaluation) are 2020-2023 (U2 thru U4).	Rewinds of Units 2-4.	Yes. No detailed information from NW due diligence report that windings will not need to be replaced before the scheduled	
b	Windings Test Data - PI, Doble, etc.	Routine PM tests can measure the loss of insulation life and be indicators for a rewind.		No detailed information from NW due diligence.			

No.	Item	Specific Issue	Source Document(s) *(Explicitly identify that part of the record that would indicate there is a potential problem)*	Describe the concern	Potential Remedy	Po ential o incur significant cos s (> $0.5 million) Yes or No	Other Comments
c	Rotor - inspection reports for fatigue & cracks, field windings	Metal fatigue can cause cracking in the rotor components and ultimately lead to a catastrophic failure		No detailed information from NW due diligence.	Replace rotor components.	date.	
d	Vibration data	Vibration monitoring can reveal mechanical problems in the gates, bearings and speed increasers (where applicable) that require repair.		No detailed information from NW due diligence.	Repair/replace bearings, gates.		

	Project/Development/FERC ID		Year Built	License Expiration			
	Missouri-Madison Project/Madison Development/FERC No. 2188-08		1905-1906	8/31/2040			
No.	**Item**	**Specific Issue**	**Source Document(s)** ***(Explicitly identify that part of the record that would indicate there is a potential problem)***	**Describe the concern**	**Potential Remedy**	**Potential to incur significant costs (> $0.5 million) Yes or No**	**Other Comments**
1	Auxillary mechanical systems						
a	Station dewatering	Keep submerged portions of the powerhouse structure and equipment dry.	None	No detailed information from NW due diligence.		Unknown	
b	HVAC	Maintain powerhouse ambient temperature within acceptable range.	None	No detailed information from NW due diligence.		Unknown	
c	Powerhouse crane	Lifting/rigging capability to support maintenace activities.	None	No detailed information from NW due diligence.		Unknown	
d	*Other (list)*						
2	Gates & Valves						
a	Penstock headgate	Means of stopping flow into the penstock and/or turbine.	None	No detailed information from NW due diligence.		Unknown	
b	Unit dewatering gates/valves	Means of dewatering pressure case/draft tube to support maintenance activities.	None	No detailed information from NW due diligence.		Unknown	
c	HPU/accumulator	Hydraulic power to operate gates and valves.	None	No detailed information from NW due diligence.		Unknown	
d	*Other (list)*						
3	Governor System						
a	Full governor/gate actuator	Means of controlling wicket gates and water flow to the turbine runner.	WTR-2.1, page 71.			Unknown	Governor upgades "have been implemented". No other detailed information available.
b	Accumulator/emergency close	Means of closing wicket gates/penstock headgates in the event of loss of station service.	None	No detailed information from NW due diligence.		Unknown	
c	*Other (list)*						
4	Turbines		WTR-2.1, page 71. Response to PSC-066, attached CD, "Hydro Capital" tab.	Four horizontal Francis units, ISD 1906. Original equipment.		Yes	"Turbine-Generator Upgrades planned 2020 - 2023. Insufficient data to confirm the adequacy of the proposed budget and schedule for the turbine overhauls.
a	Bearings/alignment	Condition of wear surfaces, clearances,operating temperature, vibration and shaft alignment.	None	No detailed information from NW due diligence.		Unknown	
b	Pressure case	Structural integrity, metalurgical fatigue, ability to safely withstand normal and transient operating conditions.	None	No detailed information from NW due diligence.		Unknown	
c	Stay vanes & wicket gates	Condition, hydraulic profiles, wicket gate linkage and wicket gate pinch.	None	No detailed information from NW due diligence.		Unknown	
d	Runner	Structural integrity, cavitation damage, hydraulic profiles, metalurgical fatigue.	None	No detailed information from NW due diligence.		Unknown	
e	Seal clearances/Headcover pressure	Excessive seal clearances result in decreased performance and increased pressure on headcover.	None	No detailed information from NW due diligence.		Unknown	
f	Draft tube	Structural integrity, hydraulic profile, maintain suction head for runners set above tailwater.	None	No detailed information from NW due diligence.		Unknown	

	Project/Development/FERC ID		Year Built	License Expiration			
	Missouri-Madison Project/Madison Development/FERC No. 2188-08		1905-1906	08/31/40			
No.	Item	Specific Issue	Source Document(s) *(Explicitly identify that part of the record that would indicate there is a potential problem)*	Describe the concern	Potential Remedy	Potential to incur significant costs (> $0.5 million) Yes or No	Other Comments
1	**Compliance with FERC License Order**						
a	Environmental requirements and management plans (WQ, fish and wildlife, recreation, lands, etc). Are there any outstanding compliance issues?	FERC licenses typicaly include specific environmental protection, mitigation, and enhancement (PM&E) measures.	Exhibit_(WTR-2.1), p 109-110 Exhibit_(WTR-2.3), p 10	None. Filings indicate the project is in compliance with license requirements.	NA	No	
b	Fish passage requirements (capital and operational)	FERC licenses can include specific fish passage requirements.	Exhibit_(WTR-2.1), p 109	None. Filings to not note any specific fish passage requirements.	NA	No	
c	Capital improvements for recreation facilities	FERC licenses frequently include specific recreational enhancement measures.	Exhibit_(WTR-2.1), p 110-111	None. Filings indicate the project is in compliance with license requirements for recreation.	NA	No	
d	Annual operating costs for environmental compliance (monitoring, etc)	Costs for license compliance are included in the annual O&M budget. Projected costs are based on historic costs.	Exhibit_(WTR-2.1), p 162, 168 Exhibit_(WTR-2.3), p 189 Exhibit__(JMS-1) and (JMS-2). Response to MCC-028 (2-4-14)	Response to PSC-181 states that costs will be absorbed as part of annual O&M budget. There is insufficient information to determine if the projected O&M budget is adequate to cover future compliance needs.	Develop line-item budget projections per compliance requirement with a contingency.	Yes	
2	**FERC Relicensing (future exposure)**	Projects must be relicensed every 30-50 years, depending on the terms of the existing license. The Thompson Falls license expires in 2025. Licensing proceedings typically begin at least 5 years prior to licence expiration.	Exhibit_(WTR-2.3), p 9	None. License issued on 9/27/00 and expires on 8/31/40.	NA	No	
3	**Endangered Species Act**						
a	Existing listings and requirements	There may be special requirements for the protection of existing rare, threatened or endangered species affected by the project.	Exhibit_(WTR-2.1), p 109-110	None. Existing license and MOU include measures intended to protect listed species.	NA	No	
b	Exposure for future listings	Future ESA listings could result in new requirements being imposed on the project to protect rare, threatened or endangered species.	Exhibit_(WTR-2.3), p 12 Response to PSC-031, 190, 191 Response to MCC-198	Filings indicate that potetnial future listing of Artic Grayling could result in unexpected costs, however potential listing, timing, and requirements are uncertain.	Establish contingency fund	Yes	
4	**EPA - Contamination and Super Fund Sites (human health and safety)**	Potential for contamination or other environmental health issues.	Exhibit_(WTR-2.1), p 106-107	None. Filings do not note any significant contamination issues.	NA	No	
5	**Historic Preservation and Tribal Issues**	FERC licenses often include specific measures to protect historic and cultural resources.	Exhibit_(WTR-2.1), p 110	None. Filings indicate the project is in compliance with license requirements.	NA	No	
6	**Water Rights**	Licensees must maintain adequate land and water rights to operate and maintain the project.	Exhibit_(WTR-2.1), p 108	None. Filings list water rights claims.	NA	No	

Project/Development/FERC ID			Year Built	License Expiration			
Missouri-Madison Project/Morony Development/FERC No. 2188-02			1928-1929	8/31/2040			
No.	**Item**	**Specific Issue**	**Source Document(s)** ***(Explicitly identify that part of the record that would indicate there is a potential problem)***	**Describe the concern**	**Potential Remedy**	**Potential to incur significant costs (> $0.5 million) Yes or No**	**Other Comments**
Project/Development/FERC ID							
1	**Water Retaining Structures (Spillways/Nonoverflows/Intakes/Intake-Powerhouses/Embankments)**						
a	Right Nonoverflow, Spillway, Intake/Powerhouse, Left Nonoverflow	[redacted] (Category II PFMs 2, 6, 7, 10, 12)	Exhibit__(WTR-5.8), pp 25-28, 104)	[redacted]	[redacted]	Yes	
2	**Appurtenances (Penstocks/Tunnels/Canals/Surge Tanks/Powerhouses/Tailraces)**						
a	Powerhouse	[redacted]	Exhibit__(WTR-5.8), pp 51-53	[redacted]	None anticipated	No	
3	**Public Safety**	[redacted]	Exhibit__(WTR-6.8), p 19	[redacted]	None anticipated	No	
4	**Security**	[redacted]	Exhibit__(WTR-6.8), p 20	[redacted]	None anticipated	No	

	Project/Development/FERC ID		Year Built	License Expiration			
	Missouri-Madison Project/Morony Development/FERC No. 2188-02		1928-1929	8/31/2040			
No.	**Item**	**Specific Issue**	**Source Document(s) *(Explicitly identify that part of the record that would indicate there is a potential problem)***	**Describe the concern**	**Potential Remedy**	**Potential to incur significant costs (> $0.5 million) Yes or No**	**Other Comments**
1	Plant General Arrangement & 1-Line						
a	Back-up and Emergency Power	Back-up sources of electric power required in the event of an emergency or utility outage.	Emergency Action Plan (WTR-8.8)	None anticipated.	N/A	No.	[redacted]
b	Reliability (i.e., n-1 design service loss)	Impact of the loss of any one major component results in the loss of generation of one unit.	Document 7.7.3.41.7.2.9.1 and Response to PSC-179	None anticipated.	None. One spare transformer is available that can be used at Morony in the event of a failure.	No.	[redacted]
2	Interconnection & Transmission						
a	Power rating - normal configuration	Transmission System capability for evacuation of power from the plant with a normal system configuration.	No information available.	No detailed information from NW due diligence.	Unknown. Insufficient information regarding transmission system constraints.	Yes	System interconnection studies can determine power transfer capabilities under normal and contingency conditions.
b	Power rating - 1st contingency	Transmission System capability for evacuation of power from the plant under a 1st contingency condition.	No information available.	No detailed information from NW due diligence.		Yes	
3	Automation and Controls						
a	Exciter and Governor - WECC Compliance	Exciter and Governors conform to WECC requirements	Shaw Due Diligence Report (WTR-2.1)	None anticipated.	N/A	No	Governor and Exciter upgrades performed.
b	Remote Monitoring & Control Capability	Plant operational from remote control center	Shaw Due Diligence Report (WTR-2.1)	Upgrades not performed	Upgrades were scheduled for 2013.	Yes	
c	Automatic Controls and Protection	Control and protection systems designed for automatic operation.	Shaw Due Diligence Report (WTR-2.1)	None anticipated.	N/A	No	Upgrades performed.
4	Main Step-up Transformers						
a	Age	Age is an indicator of the remaining useful life of a transformer.	Response to PSC-179	None anticipated.	N/A	No	70 MVA, 3-phase transformer installed in 2011
b	Loading History	Loading history is an indicator of the remaining useful life of a transformer.		None anticipated.			Max. connected generator load is 70 MVA corresponding to the transformer rating of 70 MVA.
c	Dissolved Gas Analysis (DGA) Test Data	Regular PM checks of dissolved gasses in the oil are an industry-accepted measure of the condition of a transformer.	Response to PSC-179	None anticipated.			All tests results are rated "Good".
5	Generators						
a	Stator Winding - Type and Age	The age and type of winding is an indicator of its remaining useful life.	Shaw Due Diligence Report (WTR-2.1)	Generators were originally installed in 1930 and rewound in 1983 and 2011.	Rewind generator.	Yes. No detailed information from NW due diligence report that machine parts will not need to be replaced before the scheduled date.	
b	Windings Test Data - PI, Doble, etc.	Routine PM tests can measure the loss of insulation life and be indicators for a rewind.		No detailed information from NW due diligence.			
c	Rotor - inspection reports for fatigue & cracks, field windings	Metal fatigue can cause cracking in the rotor components and ultimately lead to a catastrophic failure		No detailed information from NW due diligence.	Replace rotor components.		
d	Vibration data	Vibration monitoring can reveal mechanical problems in the gates, bearings and speed increasers (where applicable) that require repair.		No detailed information from NW due diligence.	Repair/replace bearings, gates.		

	Project/Development/FERC ID		Year Built	License Expiration			
	Missouri-Madison Project/Morony Development/FERC No. 2188-02		1928-1929	8/31/2040			
No.	Item	Specific Issue	Source Document(s) *(Explicitly identify that part of the record that would indicate there is a potential problem)*	Describe the concern	Potential Remedy	Potential to incur significant costs (> $0.5 million) Yes or No	Other Comments
1	Auxillary mechanical systems						
a	Station dewatering	Keep submerged portions of the powerhouse structure and equipment dry.	None	No detailed information from NW due diligence.		Unknown	
b	HVAC	Maintain powerhouse ambient temperature within acceptable range.	None	No detailed information from NW due diligence.		Unknown	
c	Powerhouse crane	Lifting/rigging capability to support maintenace activities.	None	No detailed information from NW due diligence.		Unknown	
d	*Other (list)*						
2	Gates & Valves						
a	Penstock headgate	Means of stopping flow into the penstock and/or turbine.	None	No detailed information from NW due diligence.		Unknown	
b	Unit dewatering gates/valves	Means of dewatering pressure case/draft tube to support maintenance activities.	None	No detailed information from NW due diligence.		Unknown	
c	HPU/accumulator	Hydraulic power to operate gates and valves.	None	No detailed information from NW due diligence.		Unknown	
d	*Other (list)*						
3	Governor System						
a	Full governor/gate actuator	Means of controlling wicket gates and water flow to the turbine runner.	WTR-2.1, page 73.			No	"Upgrades have been implemented." Governor replacement is budgeted for 2015.
b	Accumulator/emergency close	Means of closing wicket gates/penstock headgates in the event of loss of station service.	None	No detailed information from NW due diligence.		Unknown	
c	*Other (list)*						
4	Turbines		WTR-2.1, page 73.	Unit 2 went into service in 1930. No information on plans to overhaul the turbine or runner replacements. Reliability and level of performance is unknown.	Turbine overhaul including runner repair or replacement.	Yes	Two vertical Francis units. 1930 ISD. Original equipment. Unit 1 "Generator and Turbine" upgrades were scheduled for 2013. NW has not indicated any plans to overhaul Unit 2. No other detailed information available.
a	Bearings/alignment	Condition of wear surfaces, clearances,operating temperature, vibration and shaft alignment.	None	No detailed information from NW due diligence.		Unknown	
b	Pressure case	Structural integrity, metalurgical fatigue, ability to safely withstand normal and transient operating conditions.	None	No detailed information from NW due diligence.		Unknown	
c	Stay vanes & wicket gates	Condition, hydraulic profiles, wicket gate linkage and wicket gate pinch.	None	No detailed information from NW due diligence.		Unknown	
d	Runner	Structural integrity, cavitation damage, hydraulic profiles, metalurgical fatigue.	None	No detailed information from NW due diligence.		Unknown	
e	Seal clearances/Headcover pressure	Excessive seal clearances result in decreased performance and increased pressure on headcover.	None	No detailed information from NW due diligence.		Unknown	

No.	Item	Specific Issue	Source Document(s) *(Explicitly identify that part of the record that would indicate there is a potential problem)*	Describe the concern	Potential Remedy	Potential to incur significant costs (> $0.5 million) Yes or No	Other Comments
f	Draft tube	Structural integrity, hydraulic profile, maintain suction head for runners set above tailwater.	None	No detailed information from NW due diligence.		Unknown	

	Project/Development/FERC ID		Year Built	License Expiration			
	Missouri-Madison Project/Morony Development/FERC No. 2188-02		**1928-1929**	**8/31/2040**			
No.	**Item**	**Specific Issue**	**Source Document(s)** ***(Explicitly identify that part of the record that would indicate there is a potential problem)***	**Describe the concern**	**Potential Remedy**	**Potential to incur significant costs (> $0.5 million) Yes or No**	**Other Comments**
1	**Compliance with FERC License Order**						
a	Environmental requirements and management plans (WQ, fish and wildlife, recreation, lands, etc). Are there any outstanding compliance issues?	FERC licenses typicaly include specific environmental protection, mitigation, and enhancement (PM&E) measures.	Exhibit_(WTR-2.1), p 155-157 Exhibit_(WTR-2.3), p 12	None. Filings indicate the project is in compliance with license requirements.	NA	No	
b	Fish passage requirements (capital and operational)	FERC licenses can include specific fish passage requirements.	Exhibit_(WTR-2.1), p 156	None. Filings do not note any specific fish passage requirements.	NA	No	
c	Capital improvements for recreation facilities	FERC licenses frequently include specific recreational enhancement measures.	Exhibit_(WTR-2.1), p 157-159	None. Filings indicate the project is in compliance with license requirements for recreation.	NA	No	
d	Annual operating costs for environmental compliance (monitoring, etc)	Costs for license compliance are included in the annual O&M budget. Projected costs are based on historic costs.	Exhibit_(WTR-2.1), p 162, 168 Exhibit_(WTR-2.3), p 189 Exhibit__(JMS-1) and (JMS-2). Response to MCC-028 (2-4-14)	There is insufficient information to determine if the projected O&M budget is adequate to cover future compliance needs.	Develop line-item budget projections per compliance requirement with a contingency.	Yes	
2	**FERC Relicensing (future exposure)**	Projects must be relicensed every 30-50 years, depending on the terms of the existing license. The Thompson Falls license expires in 2025. Licensing proceedings typically begin at least 5 years prior to licence expiration.	Exhibit_(WTR-2.3), p 9	None. License issued on 9/27/00 and expires on 8/31/40.	NA	No	
3	**Endangered Species Act**						
a	Existing listings and requirements	There may be special requirements for the protection of existing rare, threatened or endangered species affected by the project.	Exhibit_(WTR-2.1), p 156	None. Existing license and MOU include measures intended to protect listed species.	NA	No	
b	Exposure for future listings	Future ESA listings could result in new requirements being imposed on the project to protect rare, threatened or endangered species.	Exhibit_(WTR-2.1), p 156	None. Filings do not note any known potential future ESA listings that would affect the Project.	NA	No	
4	**EPA - Contamination and Super Fund Sites (human health and safety)**	Potential for contamination or other environmental health issues.	Exhibit_(WTR-2.1), p 153 Exhibit_(WTR-2.3), p 16	None. Filings do not indicate any significant known contamination issues.	NA	No	
5	**Historic Preservation and Tribal Issues**	FERC licenses often include specific measures to protect historic and cultural resources.	Exhibit_(WTR-2.1), p 157	None. Filings indicate the project is in compliance with license requirements.	NA	No	
6	**Water Rights**	Licensees must maintain adequate land and water rights to operate and maintain the project.	Exhibit_(WTR-2.1), p 154	None. Filings list water rights claims.	NA	No	

Project/Development/FERC ID			Year Built	License Expiration			
Mystic Project/FERC No. 2301			1925	1/1/2050			
No.	**Item**	**Specific Issue**	**Source Document(s)** ***(Explicitly identify that part of the record that would indicate there is a potential problem)***	**Describe the concern**	**Potential Remedy**	**Potential to incur significant costs (> $0.5 million) Yes or No**	**Other Comments**
1	**Water Retaining Structures (Spillways/Nonoverflows/Intakes/Intake-Powerhouses/Embankments)**						
a	Left trust block of arch dam	(Category II PFM 6)	Exhibit__(WTR-5.9), p 39			Yes	
b	Arch dam	(Category II PFMs 18, 23; Category IV PFM 26)	Exhibit__(WTR-5.9), pp 53, 57, 62			Yes	
2	**Appurtenances (Penstocks/Tunnels/Canals/Surge Tanks/Powerhouses/Tailraces)**						
a	Powerhouse		Exhibit__(WTR-5.9), p 86		None anticipated	No	
b	Flowline/Penstocks	(PFM 10, Category II)	Exhibit__(WTR-2.3), pp 18,19; Exhibit__(WTR-5.9), p 21, 45			Yes	
3	**Public Safety**		Exhibit__(WTR-6.9), p 19		None anticipated	No	
4	**Security**		Exhibit__(WTR-6.9), p 19		None anticipated	No	

	Project/Development/FERC ID		Year Built	License Expiration			
	Mystic Project/FERC No. 2301		1925	01/01/50			
No.	Item	Specific Issue	Source Document(s) *(Explicitly identify that part of the record that would indicate there is a potential problem)*	Describe the concern	Potential Remedy	Potential to incur significant costs (> $0.5 million) Yes or No	Other Comments
1	Plant General Arrangement & 1-Line						
a	Back-up and Emergency Power	Back-up sources of electric power required in the event of an emergency or utility outage.	Emergency Action Plan (WTR-8.5)	None anticipated.	N/A	No.	[redacted]
b	Reliability (i.e., n-1 design service loss)	Impact of the loss of any one major component results in the loss of generation of one unit.	Document 7.7.3.41.7.2.10.1 41502-C8-1-03 Model and Response to PSC-179	None anticipated.	N/A	No.	[redacted]
2	Interconnection & Transmission						
a	Power rating - normal configuration	Transmission System capability for evacuation of power from the plant with a normal system configuration.	Shaw Due Diligence Report (WTR-2.1)	Report states that a rebuild of one of the two transmission lines servicing the project is planned for 2015.	Unknown. Insufficient information regarding transmission system constraints to make a judgement as to its remedy.	Yes	System interconnection studies can determine power transfer capabilities under normal and contingency conditions.
b	Power rating - 1st contingency	Transmission System capability for evacuation of power from the plant under a 1st contingency condition.	No information available.	Ability of the plant to continue operation under utility system contingencies.	Unknown. Insufficient information regarding the constraint to make a judgement as to its remedy.	Yes	
3	Automation and Controls						
a	Exciter and Governor - WECC Compliance	Exciter and Governors conform to WECC requirements	Shaw Due Diligence Report (WTR-2.1)	Governor Upgrades performed. No information whether exciter upgrades are planned.	Replacement of voltage regulators and/or exciters to conform to WECC requirements.	Yes	
b	Remote Monitoring & Control Capability	Plant operational from remote control center	Shaw Due Diligence Report (WTR-2.1)	None anticipated.	N/A	No	Upgrades performed
c	Automatic Controls and Protection	Control and protection systems designed for automatic operation.	Shaw Due Diligence Report (WTR-2.1)	None anticipated.	N/A	No	Upgrades performed
4	Main Step-up Transformers						
a	Age	Age is an indicator of the remaining useful life of a transformer.	Response to PSC-179	None anticipated.	Replacement of GSU.	Yes	Two 12.5 MVA, 3-phase transformers installed in 2002.
b	Loading History	Loading history is an indicator of the remaining useful life of a transformer.	Response to PSC-179	None anticipated.			Max. connected generator load is 7.5 MVA. Transformer loading is within rated capacity.
c	Dissolved Gas Analysis (DGA) Test Data	Regular PM checks of dissolved gasses in the oil are an industry-accepted measure of the condition of a transformer.	Response to PSC-179	Both transformer DGAs meet Condition IV, meaning that the TDCG in this range indicates indicates excessive level of decomposition. Continued operation can result in failure of transformer.			
5	Generators						
a	Stator Winding - Type and Age	The age and type of winding is an indicator of its remaining useful life.	Shaw Due Diligence Report (WTR-2.1)	Rewinds performed in 1979 (U1), 1980 (U2)			

No.	Item	Specific Issue	Source Document(s) *(Explicitly identify that part of the record that would indicate there is a potential problem)*	Describe the concern	Potential Remedy	Potential to incur significant costs (> $0.5 million) Yes or No	Other Comments
b	Windings Test Data - PI, Doble, etc.	Routine PM tests can measure the loss of insulation life and be indicators for a rewind.		No detailed information from NW due diligence.	Rewind Generator.	Yes. No detailed information from NW due diligence report that machine parts will not need to be replaced before the scheduled date.	
c	Rotor - inspection reports for fatigue & cracks, field windings	Metal fatigue can cause cracking in the rotor components and ultimately lead to a catastrophic failure		No detailed information from NW due diligence.	Replace rotor components.		
d	Vibration data	Vibration monitoring can reveal mechanical problems in the gates, bearings and speed increasers (where applicable) that require repair.		No detailed information from NW due diligence.	Repair/replace bearings, gates.		

	Project/Development/FERC ID		Year Built	License Expiration			
	Mystic Project/FERC No. 2301		**1925**	**01/01/50**			
No.	**Item**	**Specific Issue**	**Source Document(s) *(Explicitly identify that part of the record that would indicate there is a potential problem)***	**Describe the concern**	**Potential Remedy**	**Potential to incur significant costs (> $0.5 million) Yes or No**	**Other Comments**
1	Auxillary mechanical systems						
a	Station dewatering	Keep submerged portions of the powerhouse structure and equipment dry.	None	No detailed information from NW due diligence.		Unknown	
b	HVAC	Maintain powerhouse ambient temperature within acceptable range.	None	No detailed information from NW due diligence.		Unknown	
c	Powerhouse crane	Lifting/rigging capability to support maintenace activities.	None	No detailed information from NW due diligence.		Unknown	
d	*Other (list)*						
2	Gates & Valves						
a	Penstock headgate	Means of stopping flow into the penstock and/or turbine.	None	No detailed information from NW due diligence.		Unknown	
b	Unit dewatering gates/valves	Means of dewatering pressure case/draft tube to support maintenance activities.	None	No detailed information from NW due diligence.		Unknown	
c	HPU/accumulator	Hydraulic power to operate gates and valves.	None	No detailed information from NW due diligence.		Unknown	
d	*Other (list)*						
3	Governor System						
a	Full governor/gate actuator	Means of controlling wicket gates and water flow to the turbine runner.	WTR-2.1, page 71.			Unknown	Governor upgades "have been implemented". No other detailed information available.
b	Accumulator/emergency close	Means of closing wicket gates/penstock headgates in the event of loss of station service.	None	No detailed information from NW due diligence.		Unknown	
c	*Other (list)*						
4	Turbines		WTR-2.1, page 70				Two Pelton Turbines, 1925 ISD.
a	Bearings/alignment	Condition of wear surfaces, clearances,operating temperature, vibration and shaft alignment.	None	No detailed information from NW due diligence.		Unknown	
b	Pressure case	Structural integrity, metalurgical fatigue, ability to safely withstand normal and transient operating conditions.	None	No detailed information from NW due diligence.		Unknown	
c	Nozzles	Condition, hydraulic profiles, wicket gate linkage and wicket gate pinch.	None	No detailed information from NW due diligence.		Unknown	
d	Runner	Structural integrity, cavitation damage, hydraulic profiles, metalurgical fatigue.	WTR-2.1, page 70			Unlikely	Runners replaced in 2007 & 2008. No other information provided.

	Project/Development/FERC ID		Year Built	License Expiration			
	Mystic Project/FERC No. 2301		**1925**	**1/1/2050**			
No.	**Item**	**Specific Issue**	**Source Document(s)** ***(Explicitly identify that part of the record that would indicate there is a potential problem)***	**Describe the concern**	**Potential Remedy**	**Potential to incur significant costs (> $0.5 million) Yes or No**	**Other Comments**
1	**Compliance with FERC License Order**						
a	Environmental requirements and management plans (WQ, fish and wildlife, recreation, lands, etc). Are there any outstanding compliance issues?	FERC licenses typicaly include specific environmental protection, mitigation, and enhancement (PM&E) measures.	Exhibit_(WTR-2.1), p 93-94 Exhibit_(WTR-2.3), p 11	None. Filings indicate the project is in compliance with license requirements.	NA	No	
b	Fish passage requirements (capital and operational)	FERC licenses can include specific fish passage requirements.	Exhibit_(WTR-2.1), p 93-94	None. Filings to not note any specific fish passage requirements.	NA	No	
c	Capital improvements for recreation facilities	FERC licenses frequently include specific recreational enhancement measures.	Exhibit_(WTR-2.1), p 95	There is insufficient information to determine compliance status.	Document status	No	
d	Annual operating costs for environmental compliance (monitoring, etc)	Costs for license compliance are included in the annual O&M budget. Projected costs are based on historic costs.	Exhibit_(WTR-2.1), p 162, 168 Exhibit_(WTR-2.3), p 189 Exhibit__(JMS-1) and (JMS-2). Response to MCC-028 (2-4-14)	There is insufficient information to determine if the projected O&M budget is adequate to cover future compliance needs.	Develop line-item budget projections per compliance requirement with a contingency.	Yes	
2	**FERC Relicensing (future exposure)**	Projects must be relicensed every 30-50 years, depending on the terms of the existing license.	Exhibit_(WTR-2.3), p 9	None. License issued on 12/17/07 and expires on 12/31/50.	NA	No	
3	**Endangered Species Act**						
a	Existing listings and requirements	There may be special requirements for the protection of existing rare, threatened or endangered species affected by the project.	Exhibit_(WTR-2.1), p 93	None. Filings do not note any listed species issues.	NA	No	
b	Exposure for future listings	Future ESA listings could result in new requirements being imposed on the project to protect rare, threatened or endangered species.	Exhibit_(WTR-2.1), p 93	None. Filings do not note any known potential future ESA listings that would affect the project.	NA	No	
4	**EPA - Contamination and Super Fund Sites (human health and safety)**	Potential for contamination or other environmental health issues.	Exhibit_(WTR-2.1), p 91	None. Filings do not note any known significant contamination issues.	NA	No	
5	**Historic Preservation and Tribal Issues**	FERC licenses often include specific measures to protect historic and cultural resources.	Exhibit_(WTR-2.1), p 96	Data are insuficient to determine compliance.	NA	No	
6	**Water Rights**	Licensees must maintain adequate land and water rights to operate and maintain the project.	Exhibit_(WTR-2.1), p 93	None. Filings list water rights claims.	NA	No	

Project/Development/FERC ID			Year Built	License Expiration			
Missouri-Madison Project/Rainbow Development/FERC No. 2188-04			1908-1910	8/31/2040			
No.	**Item**	**Specific Issue**	**Source Document(s)** ***(Explicitly identify that part of the record that would indicate there is a potential problem)***	**Describe the concern**	**Potential Remedy**	**Potential to incur significant costs (> $0.5 million) Yes or No**	**Other Comments**
1	**Water Retaining Structures (Spillways/Nonoverflows/Intakes/Intake-Powerhouses/Embankments)**						
a	Spillway	(PFM 18, Category I)	Exhibit__(WTR-5.10), pp 25, 51; Exhibit__(WTR-6.10), p 10			Yes	
b	Spillway	(PFM 20, Category II)	Exhibit__(WTR-5.10), pp 20,28,30,54,88; Exhibit__(WTR-6.1), p 8; Exhibit__(WTR-2.1), p 59			Yes	
2	**Appurtenances: Penstocks, Tunnels, Canals, Surge Tanks, Powerhouses, Tailraces**		Exhibit_(WTR-5.10), pp 90, 91		None anticipated	No	
3	**Public Safety**		Exhibit__(WTR-6.10), p 17		None anticipated	No	
4	**Security**		Exhibit__(WTR-6.10), p 18		None anticipated	No	

	Project/Development/FERC ID		Year Built	License Expiration			
	Missouri-Madison Project/Rainbow Development/FERC No. 2188-04		**1908-1910**	**8/31/2040**			
No.	**Item**	**Specific Issue**	**Source Document(s)** ***(Explicitly identify that part of the record that would indicate there is a potential problem)***	**Describe the concern**	**Potential Remedy**	**Potential to incur significant costs (> $0.5 million) Yes or No**	**Other Comments**
1	Plant General Arrangement & 1-Line						
a	Back-up and Emergency Power	Back-up sources of electric power required in the event of an emergency or utility outage.	Emergency Action Plan (WTR-8.10)	None anticipated.	N/A	No.	[redacted]
b	Reliability (i.e., n-1 design service loss)	Impact of the loss of any one major component results in the loss of generation of one unit.	Shaw Due Diligence Report (WTR-2.1) and Response to PSC-179.	None anticipated.	N/A	No.	The original 8 units will be retired after the new 77.5 MVA Kaplan unit goes into service. Only the single 77.5 MVA unit will be connected to a 102 MVA GSU to remain in service.
2	Interconnection & Transmission						
a	Power rating - normal configuration	Transmission System capability for evacuation of power from the plant with a normal system configuration.	No information available.	No detailed information from NW due diligence.	Unknown. Insufficient information regarding transmission system constraints.	Yes	System interconnection studies can determine power transfer capabilities under normal and contingency conditions.
b	Power rating - 1st contingency	Transmission System capability for evacuation of power from the plant under a 1st contingency condition.	No information available.	No detailed information from NW due diligence.		Yes	
3	Automation and Controls						
a	Exciter and Governor - WECC Compliance	Exciter and Governors conform to WECC requirements	Shaw Due Diligence Report (WTR-2.1)	None anticipated.	N/A	No	New governors and exciters for Kaplan unit.
b	Remote Monitoring & Control Capability	Plant operational from remote control center	Shaw Due Diligence Report (WTR-2.1)	None anticipated.	N/A	No	New control system for Kaplan unit.
c	Automatic Controls and Protection	Control and protection systems designed for automatic operation.	Shaw Due Diligence Report (WTR-2.1)	None anticipated.	N/A	No	New relaying and controls for Kaplan unit.
4	Main Step-up Transformers						
a	Age	Age is an indicator of the remaining useful life of a transformer.	Response to PSC-179	None anticipated.	N/A	No.	New 70 MVA, 3-phase transformer installed in 2012.
b	Loading History	Loading history is an indicator of the remaining useful life of a transformer.	Response to PSC-179	None anticipated.			[redacted]
c	Dissolved Gas Analysis (DGA) Test Data	Regular PM checks of dissolved gasses in the oil are an industry-accepted measure of the condition of a transformer.		None anticipated.			Although there are no test data for the new transformer, we consider it unlikely that there would be negative results inside of 2 years operation.

No.	Item	Specific Issue	Source Document(s) *(Explicitly identify that part of the record that would indicate there is a potential problem)*	Describe the concern	Potential Remedy	Potential to incur significant costs (> $0.5 million) Yes or No	Other Comments
5	Generators						
a	Stator Winding - Type and Age	The age and type of winding is an indicator of its remaining useful life.	Shaw Due Diligence Report (WTR-2.1)	None anticipated	N/A	No	New Kaplan-driven generator being installed. Original 8 units being retired. Although there is no test data for the new generator, we consider it unlikely that there would be negative results inside of 2 years operation.
b	Windings Test Data - PI, Doble, etc.	Routine PM tests can measure the loss of insulation life and be indicators for a rewind.		None anticipated		No	
c	Rotor - inspection reports for fatigue & cracks, field windings	Metal fatigue can cause cracking in the rotor components and ultimately lead to a catastrophic failure		None anticipated	None anticipated	No	
d	Vibration data	Vibration monitoring can reveal mechanical problems in the gates, bearings and speed increasers (where applicable) that require repair.		None anticipated	None anticipated	No	

	Project/Development/FERC ID		Year Built	License Expiration			
	Missouri-Madison Project/Rainbow Development/FERC No. 2188-04		1908-1910	8/31/2040			
No.	Item	Specific Issue	Source Document(s) *(Explicitly identify that part of the record that would indicate there is a potential problem)*	Describe the concern	Potential Remedy	Potential to incur significant costs (> $0.5 million) Yes or No	Other Comments
1	Auxillary mechanical systems					Unlikely	New, 2012.
a	Station dewatering	Keep submerged portions of the powerhouse structure and equipment dry.	None				
b	HVAC	Maintain powerhouse ambient temperature within acceptable range.	None				
c	Powerhouse crane	Lifting/rigging capability to support maintenace activities.	None				
d	*Other (list)*						
2	Gates & Valves					Unlikely	New, 2012.
a	Penstock headgate	Means of stopping flow into the penstock and/or turbine.	None				
b	Unit dewatering gates/valves	Means of dewatering pressure case/draft tube to support maintenance activities.	None				
c	HPU/accumulator	Hydraulic power to operate gates and valves.	None				
d	*Other (list)*						
3	Governor System					Unlikely	New, 2012.
a	Full governor/gate actuator	Means of controlling wicket gates and water flow to the turbine runner.	None				
b	Accumulator/emergency close	Means of closing wicket gates/penstock headgates in the event of loss of station service.	None				
c	*Other (list)*						
4	Turbines		WTR-2.1, page 72.			Unlikely	One, new vertical Kaplan unit installed in 2012. Start-up problems have been encountered. Once the unit goes into commercial operation the original units will be retired.
a	Bearings/alignment	Condition of wear surfaces, clearances,operating temperature, vibration and shaft alignment.	None				
b	Pressure case	Structural integrity, metalurgical fatigue, ability to safely withstand normal and transient operating conditions.	None				
c	Stay vanes & wicket gates	Condition, hydraulic profiles, wicket gate linkage and wicket gate pinch.	None				
d	Runner	Structural integrity, cavitation damage, hydraulic profiles, metalurgical fatigue.	None				
e	Seal clearances/Headcover pressure	Excessive seal clearances result in decreased performance and increased pressure on headcover.	None				
f	Draft tube	Structural integrity, hydraulic profile, maintain suction head for runners set above tailwater.	None				

	Project/Development/FERC ID		Year Built	License Expiration			
	Missouri-Madison Project/Rainbow Development/FERC No. 2188-04		**1908-1910**	**8/31/2040**			
No.	**Item**	**Specific Issue**	**Source Document(s)** ***(Explicitly identify that part of the record that would indicate there is a potential problem)***	**Describe the concern**	**Potential Remedy**	**Potential to incur significant costs (> $0.5 million) Yes or No**	**Other Comments**
1	**Compliance with FERC License Order**						
a	Environmental requirements and management plans (WQ, fish and wildlife, recreation, lands, etc). Are there any outstanding compliance issues?	FERC licenses typicaly include specific environmental protection, mitigation, and enhancement (PM&E) measures.	Exhibit_(WTR-2.1), p 134-136 Exhibit_(WTR-2.3), p 12	None. Filings indicate the project is in compliance with license requirements.	NA	No	
b	Fish passage requirements (capital and operational)	FERC licenses can include specific fish passage requirements.	Exhibit_(WTR-2.1), p 134	None. Filings do not note any specific fish passage requirements.	NA	No	
c	Capital improvements for recreation facilities	FERC licenses frequently include specific recreational enhancement measures.	Exhibit_(WTR-2.1), p 136-138	None. Filings indicate the project is in compliance with license requirements for recreation.	NA	No	
d	Annual operating costs for environmental compliance (monitoring, etc)	Costs for license compliance are included in the annual O&M budget. Projected costs are based on historic costs.	Exhibit_(WTR-2.1), p 162, 168 Exhibit_(WTR-2.3), p 189 Exhibit__(JMS-1) and (JMS-2). Response to MCC-028 (2-4-14)	There is insufficient information to determine if the projected O&M budget is adequate to cover future compliance needs.	Develop line-item budget projections per compliance requirement with a contingency.	Yes	
2	**FERC Relicensing (future exposure)**	Projects must be relicensed every 30-50 years, depending on the terms of the existing license. The Thompson Falls license expires in 2025. Licensing proceedings typically begin at least 5 years prior to licence expiration.	Exhibit_(WTR-2.3), p 9	None. License issued on 9/27/00 and expires on 8/31/40.	NA	No	
3	**Endangered Species Act**						
a	Existing listings and requirements	There may be special requirements for the protection of existing rare, threatened or endangered species affected by the project.	Exhibit_(WTR-2.1), p 134-135	None. Existing license and MOU include measures intended to protect listed species.	NA	No	
b	Exposure for future listings	Future ESA listings could result in new requirements being imposed on the project to protect rare, threatened or endangered species.	Exhibit_(WTR-2.1), p 134-135	None. Filings do not note any known potential future ESA listings that would affect the Project.	NA	No	

No.	Item	Specific Issue	Source Document(s) *(Explicitly identify that part of the record that would indicate there is a potential problem)*	Describe the concern	Potential Remedy	Potential to incur significant costs (> $0.5 million) Yes or No	Other Comments
4	**EPA - Contamination and Super Fund Sites (human health and safety)**	Potential for contamination or other environmental health issues.	Exhibit_(WTR-2.1), p 131-132 Exhibit_(WTR-2.3), p 15 Response to PSC-031; Response to PSC-080; Response to MCC-200	Filings indicate that there are several potential environmental clean-up issues associated with demolition of the old Rainbow powerhouse that are not included in current contractor estimates. Filings state that NWE has included $1,000,000 in the capital budget forecast for 2015 for demolition of the old powerhouse. There is insufficent information to determine if this includes adequate funds for environmental remediation. Filings state that NWE does not expect soil remediation costs associated with demolition to exceed the above noted allowance.	Provide detailed cost estimate for demolition and environmental clean-up.	Yes	
5	**Historic Preservation and Tribal Issues**	FERC licenses often include specific measures to protect historic and cultural resources.	Exhibit_(WTR-2.1), p 136	None. Filings indicate the project is in compliance with license requirements.	NA	No	
6	**Water Rights**	Licensees must maintain adequate land and water rights to operate and maintain the project.	Exhibit_(WTR-2.1), p 133	None. Filings list water rights claims.	NA	No	

Project/Development/FERC ID			Year Built	License Expiration			
Missouri-Madison Project/Ryan Development/FERC No. 2188-02			1915	8/31/2040			
No.	**Item**	**Specific Issue**	**Source Document(s)** ***(Explicitly identify that part of the record that would indicate there is a potential problem)***	**Describe the concern**	**Potential Remedy**	**Potential to incur significant costs (> $0.5 million) Yes or No**	**Other Comments**
1	**Water Retaining Structures (Spillways/Nonoverflows/Intakes/Intake-Powerhouses/Embankments)**						
a	Right Nonoverflow, Wastegate Structure, Intake	[redacted] (Category II PFMs 3, 5, 6, 9)	Exhibit__(WTR-5.11), pp 21-26, 48)	[redacted]	[redacted]	Yes	
b	Spillway	[redacted] (PFM-Other Considerations)	Exhibit__(WTR-5.11), pp 18, 28,29; Exhibit__(WTR-6.11), pp 8, 11	[redacted]	[redacted]	Yes	
2	**Appurtenances (Penstocks/Tunnels/Canals/Surge Tanks/Powerhouses/Tailraces)**						
a	Powerhouse	[redacted]	Exhibit__(WTR-5.11), pp 45, 46	[redacted]	None anticipated	No	
3	**Public Safety**	[redacted]	Exhibit__(WTR-6.11), Docket No. D2013.12.85, p 18	[redacted]	None anticipated	No	
4	**Security**	[redacted]	Exhibit__(WTR-6.11), p 19	[redacted]	None anticipated	No	

	Project/Development/FERC ID		Year Built	License Expiration			
	Missouri-Madison Project/Ryan Development/FERC No. 2188-02		**1915**	**8/31/2040**			
No.	**Item**	**Specific Issue**	**Source Document(s) *(Explicitly identify that part of the record that would indicate there is a potential problem)***	**Describe the concern**	**Potential Remedy**	**Potential to incur significant costs (> $0.5 million) Yes or No**	**Other Comments**
1	Plant General Arrangement & 1-Line						
a	Back-up and Emergency Power	Back-up sources of electric power required in the event of an emergency or utility outage.	Emergency Action Plan (WTR-8.11)	None anticipated.	N/A	No	[redacted]
b	Reliability (i.e., n-1 design service loss)	Impact of the loss of any one major component results in the loss of generation of one unit.	Response to PSC-179.	None anticipated.	N/A	No	[redacted]
2	Interconnection & Transmission						
a	Power rating - normal configuration	Transmission System capability for evacuation of power from the plant with a normal system configuration.	No information available.	No detailed information from NW due diligence.	Unknown. Insufficient information regarding transmission system constraints.	Yes	System interconnection studies can determine power transfer capabilities under normal and contingency conditions.
b	Power rating - 1st contingency	Transmission System capability for evacuation of power from the plant under a 1st contingency condition.	No information available.	No detailed information from NW due diligence.		Yes	
3	Automation and Controls						
a	Exciter and Governor - WECC Compliance	Exciter and Governors conform to WECC requirements	Shaw Due Diligence Report (WTR-2.1)	None anticipated.	N/A	No	Governor and Exciter upgrades performed.
b	Remote Monitoring & Control Capability	Plant operational from remote control center	Shaw Due Diligence Report (WTR-2.1)	None anticipated.	N/A	No	Upgrades performed.
c	Automatic Controls and Protection	Control and protection systems designed for automatic operation.	Shaw Due Diligence Report (WTR-2.1)	None anticipated.	N/A	No	Upgrades performed.
4	Main Step-up Transformers						
a	Age	Age is an indicator of the remaining useful life of a transformer.	Response to PSC-179	None anticipated.	Replacement of GSU.	Yes	Two 85 MVA, 3-phase transformers installed in 2007 and 2008
b	Loading History	Loading history is an indicator of the remaining useful life of a transformer.	Response to PSC-179	None anticipated.			Normally, each transformer is loaded below 50% of its rated capacity.
c	Dissolved Gas Analysis (DGA) Test Data	Regular PM checks of dissolved gasses in the oil are an industry-accepted measure of the condition of a transformer.	Response to PSC-179	Transformer 2 DGA meets Condition III, meaning that the TDCG in this range indicates high level of decomposition and needs additional investigation. Transformer 1 is Normal (Condition II).			

No.	Item	Specific Issue	Source Document(s) *(Explicitly identify that part of the record that would indicate there is a potential problem)*	Describe the concern	Potential Remedy	Potential to incur significant costs (> $0.5 million) Yes or No	Other Comments
5	Generators						
a	Stator Winding - Type and Age	The age and type of winding is an indicator of its remaining useful life.	Shaw Due Diligence Report (WTR-2.1)	Generators were originally installed in 1915. Rewinds in 2009 (U4) and 2010 (U2). No information that the other 4 units were rewound since installation. Next projected rewinds (per PSC-066/Mustang Evaluation) are 2019-2022 (U1, U3, U5, U6).	Rewinds of Units 1, 3, 5 and 6.	Yes. No detailed information from NW due diligence report that machine parts will not need to be replaced before the scheduled date.	
b	Windings Test Data - PI, Doble, etc.	Routine PM tests can measure the loss of insulation life and be indicators for a rewind.		No detailed information from NW due diligence.			
c	Rotor - inspection reports for fatigue & cracks, field windings	Metal fatigue can cause cracking in the rotor components and ultimately lead to a catastrophic failure		No detailed information from NW due diligence.	Replace rotor components.		
d	Vibration data	Vibration monitoring can reveal mechanical problems in the gates, bearings and speed increasers (where applicable) that require repair.		No detailed information from NW due diligence.	Repair/replace bearings, gates.		

	Project/Development/FERC ID		Year Built	License Expiration			
	Missouri-Madison Project/Ryan Development/FERC No. 2188-02		**1915**	**8/31/2040**			
No.	**Item**	**Specific Issue**	**Source Document(s)** ***(Explicitly identify that part of the record that would indicate there is a potential problem)***	**Describe the concern**	**Potential Remedy**	**Potential to incur significant costs (> $0.5 million) Yes or No**	**Other Comments**
1	Auxillary mechanical systems						
a	Station dewatering	Keep submerged portions of the powerhouse structure and equipment dry.	None	No detailed information from NW due diligence.		Unknown	
b	HVAC	Maintain powerhouse ambient temperature within acceptable range.	None	No detailed information from NW due diligence.		Unknown	
c	Powerhouse crane	Lifting/rigging capability to support maintenace activities.	None	No detailed information from NW due diligence.		Unknown	
d	*Other (list)*						
2	Gates & Valves						
a	Penstock headgate	Means of stopping flow into the penstock and/or turbine.	None	No detailed information from NW due diligence.		Unknown	
b	Unit dewatering gates/valves	Means of dewatering pressure case/draft tube to support maintenance activities.	None	No detailed information from NW due diligence.		Unknown	
c	HPU	Hydraulic power to operate gates and valves.	None	No detailed information from NW due diligence.		Unknown	
d	*Other (list)*						
3	Governor System						
a	Full governor/gate actuator	Means of controlling wicket gates and water flow to the turbine runner.	WTR-2.1, page 73.			Unknown	Governor upgades "have been implemented". No other detailed information available.
b	Accumulator/emergency close	Means of closing wicket gates/penstock headgates in the event of loss of station service.	None	No detailed information from NW due diligence.		Unknown	
c	*Other (list)*						
4	Turbines						
a	Bearings/alignment	Condition of wear surfaces, clearances,operating temperature, vibration and shaft alignment.	None	No detailed information from NW due diligence.		Unknown	
b	Pressure case	Structural integrity, metalurgical fatigue, ability to safely withstand normal and transient operating conditions.	None	No detailed information from NW due diligence.		Unknown	
c	Stay vanes & wicket gates	Condition, hydraulic profiles, wicket gate linkage and wicket gate pinch.	None	No detailed information from NW due diligence.		Unknown	
d	Runner	Structural integrity, cavitation damage, hydraulic profiles, metalurgical fatigue.	WTR-2.1, page 73. PSC-066, attached CD, "Hydro Capital" tab.	Six vertical Francis units. 1915 ISD. Units 1, 3 & 6 are original Equipment. "Turbine-Generator Upgrades" planned for 2019, 2012 & 2022. Insufficient data to confirm the adequacy of the proposed budget and schedule for the turbine overhauls		Yes	Unit 4 runner replaced 2011 Unit 2 runner replaced 2012 Unit 5 runner replacement planned for 2013.
e	Seal clearances/Headcover pressure	Excessive seal clearances result in decreased performance and increased pressure on headcover.	None	No detailed information from NW due diligence.		Unknown	

No.	Item	Specific Issue	Source Document(s) *(Explicitly identify that part of the record that would indicate there is a potential problem)*	Describe the concern	Potential Remedy	Potential to incur significant costs (> $0.5 million) Yes or No	Other Comments
f	Draft tube	Structural integrity, hydraulic profile, maintain suction head for runners set above tailwater.	None	No detailed information from NW due diligence.		Unknown	

	Project/Development/FERC ID		Year Built	License Expiration			
	Missouri-Madison Project/Ryan Development/FERC No. 2188-02		**1915**	**8/31/2040**			
No.	**Item**	**Specific Issue**	**Source Document(s)** ***(Explicitly identify that part of the record that would indicate there is a potential problem)***	**Describe the concern**	**Potential Remedy**	**Potential to incur significant costs (> $0.5 million) Yes or No**	
1	**Compliance with FERC License Order**						
a	Environmental requirements and management plans (WQ, fish and wildlife, recreation, lands, etc). Are there any outstanding compliance issues?	FERC licenses typicaly include specific environmental protection, mitigation, and enhancement (PM&E) measures.	Exhibit_(WTR-2.1), p 148-149 Exhibit_(WTR-2.3), p 12	None. Filings indicate the project is in compliance with license requirements.	NA	No	
b	Fish passage requirements (capital and operational)	FERC licenses can include specific fish passage requirements.	Exhibit_(WTR-2.1), p 149	None. Filings do not note any specific fish passage requirements.	NA	No	
c	Capital improvements for recreation facilities	FERC licenses frequently include specific recreational enhancement measures.	Exhibit_(WTR-2.1), p 150-152	None. Filings indicate the project is in compliance with license requirements for recreation.	NA	No	
d	Annual operating costs for environmental compliance (monitoring, etc)	Costs for license compliance are included in the annual O&M budget. Projected costs are based on historic costs.	Exhibit_(WTR-2.1), p 162, 168 Exhibit_(WTR-2.3), p 189 Exhibit__(JMS-1) and (JMS-2). Response to MCC-028 (2-4-14)	There is insufficient information to determine if the projected O&M budget is adequate to cover future compliance needs.	Develop line-item budget projections per compliance requirement with a contingency.	Yes	
2	**FERC Relicensing (future exposure)**	Projects must be relicensed every 30-50 years, depending on the terms of the existing license. The Thompson Falls license expires in 2025. Licensing proceedings typically begin at least 5 years prior to licence expiration.	Exhibit_(WTR-2.3), p 9	None. License issued on 9/27/00 and expires on 8/31/40.	NA	No	
3	**Endangered Species Act**						
a	Existing listings and requirements	There may be special requirements for the protection of existing rare, threatened or endangered species affected by the project.	Exhibit_(WTR-2.1), p 149	None. Existing license and MOU include measures intended to protect listed species.	NA	No	
b	Exposure for future listings	Future ESA listings could result in new requirements being imposed on the project to protect rare, threatened or endangered species.	Exhibit_(WTR-2.1), p 149	None. Filings do not note any known potential future ESA listings that would affect the Project.	NA	No	
4	**EPA - Contamination and Super Fund Sites (human health and safety)**	Potential for contamination or other environmental health issues.	Exhibit_(WTR-2.1), p 146 -147 Exhibit_(WTR-2.3), p 15	None. Filings do not indicate any significant known contamination issues.	NA	No	
5	**Historic Preservation and Tribal Issues**	FERC licenses often include specific measures to protect historic and cultural resources.	Exhibit_(WTR-2.1), p 150	None. Filings indicate the project is in compliance with license requirements.	NA	No	
6	**Water Rights**	Licensees must maintain adequate land and water rights to operate and maintain the project.	Exhibit_(WTR-2.1), p 148	None. Filings list water rights claims.	NA	No	

Project/Development/FERC ID			Year Built	License Expiration			
Thompson Falls Project/FERC No. 1869			1913-1916	12/3/2025			
No.	Item	Specific Issue	Source Document(s) *(Explicitly identify that part of the record that would indicate there is a potential problem)*	Describe the concern	Potential Remedy	Potential to incur significant costs (> $0.5 million) Yes or No	Other Comments
1	**Water Retaining Structures (Spillways/Nonoverflows/Intakes/Intake-Powerhouses/Embankments)**						
a	Main Dam Spillway, Dry Channel Dam Spillway	[redacted] (Category II PFMs 4, 20)	Exhibit__(WTR-5.12), pp 5, 8	[redacted]	[redacted]	Yes	
b	Main Dam Spillway, Dry Channel Dam Spillway	[redacted] (PFM 2, Category II; PFM 10, Category IV)	Exhibit_(WTR-5.12), pp 5, 16, 21, 43, 112; Exhibit_(WTR-2.3), p 18	[redacted]	[redacted]	Yes	
2	**Appurtenances: Penstocks, Tunnels, Canals, Surge Tanks, Powerhouses, Tailraces)**	[redacted]	Exhibit_(WTR-2.1), pp 13-18	[redacted]	None anticipated	No	
3	**Public Safety**	[redacted]	Exhibit__(WTR-6.12), p 11	[redacted]	None anticipated	No	
4	**Security**	[redacted]	Exhibit__(WTR-6.12), p 12	[redacted]	None anticipated	No	

	Project/Development/FERC ID		Year Built	License Expiration			
	Thompson Falls Project/FERC No. 1869		**1913-1916**	**12/3/2025**			
No.	**Item**	**Specific Issue**	**Source Document(s) *(Explicitly identify that part of the record that would indicate there is a potential problem)***	**Describe the concern**	**Potential Remedy**	**Potential to incur significant costs (> $0.5 million) Yes or No**	**Other Comments**
1	Plant General Arrangement & 1-Line						
a	Back-up and Emergency Power	Back-up sources of electric power required in the event of an emergency or utility outage.	Emergency Action Plan (WTR-8.12)	None anticipated.	N/A	No	[redacted]
b	Reliability (i.e., n-1 design service loss)	Impact of the loss of any one major component results in the loss of generation of one unit.	Document 7.7.3.41.7.2.12.1 Appendix G11	None anticipated.	None. One spare transformer is available that can be used at Thompson Falls in the event of a failure.	No	[redacted]
2	Interconnection & Transmission						
a	Power rating - normal configuration	Transmission System capability for evacuation of power from the plant with a normal system configuration.	No information available.	No detailed information from NW due diligence.	Unknown. Insufficient information regarding transmission system constraints.	Yes	System interconnection studies can determine power transfer capabilities under normal and contingency conditions.
b	Power rating - 1st contingency	Transmission System capability for evacuation of power from the plant under a 1st contingency condition.	No information available.	No detailed information from NW due diligence.		Yes	
3	Automation and Controls						
a	Exciter and Governor - WECC Compliance	Exciter and Governors conform to WECC requirements	Shaw Due Diligence Report (WTR-2.1)	None anticipated	N/A	No	Governor and Exciter upgrades performed.
b	Remote Monitoring & Control Capability	Plant operational from remote control center	Shaw Due Diligence Report (WTR-2.1)	No upgrades performed.	Upgrades planned for Y2013. Unknown if upgrades were performed.	Yes	
c	Automatic Controls and Protection	Control and protection systems designed for automatic operation.	Shaw Due Diligence Report (WTR-2.1)	No upgrades performed.	Upgrades planned for Y2018.	Yes	
4	Main Step-up Transformers						
a	Age	Age is an indicator of the remaining useful life of a transformer.	Response to PSC-179	None anticipated.	N/A	No	Two 30 MVA, 3-phase transformers for Units 1-6 and one 63 MVA, 3-phase transformer for Unit 7.
b	Loading History	Loading history is an indicator of the remaining useful life of a transformer.	Response to PSC-179	None anticipated.			Max. connected load to a 30 MVA transformer is 18.75 MVA. Max. connected load to the 63 MVA transformer is 52.5 MW. Transformer loading within rated capacity.
c	Dissolved Gas Analysis (DGA) Test Data	Regular PM checks of dissolved gasses in the oil are an industry-accepted measure of the condition of a transformer.	Response to PSC-179	None anticipated.			DGA analysis for TR-1 and 2 rated Condition II per IEEE C57.104 indicating normal combustible gas level. TR-3 listed as "Good".

No.	Item	Specific Issue	Source Document(s) *(Explicitly identify that part of the record that would indicate there is a potential problem)*	Describe the concern	Potential Remedy	Potential to incur significant costs (> $0.5 million) Yes or No	Other Comments
5	Generators						
a	Stator Winding - Type and Age	The age and type of winding is an indicator of its remaining useful life.	Shaw Due Diligence Report (WTR-2.1)	Rewinds on Units 1-6 installed in 1915 were performed in 1979, 83, 80, 58, 81 and 82. Unit 4 winding is more than 50 years old. Unit 7 installed in 1995.	Rewind Generator.	Yes. No detailed information from NW due diligence report that machine parts will not need to be replaced before the scheduled date.	
b	Windings Test Data - PI, Doble, etc.	Routine PM tests can measure the loss of insulation life and be indicators for a rewind.		No detailed information from NW due diligence.			
c	Rotor - inspection reports for fatigue & cracks, field windings	Metal fatigue can cause cracking in the rotor components and ultimately lead to a catastrophic failure		No detailed information from NW due diligence.	Replace rotor components.		
d	Vibration data	Vibration monitoring can reveal mechanical problems in the gates, bearings and speed increasers (where applicable) that require repair.		No detailed information from NW due diligence.	Repair/replace bearings, gates.		

	Project/Development/FERC ID		Year Built	License Expiration			
	Thompson Falls Project/FERC No. 1869		1913-1916	12/3/2025			
No.	Item	Specific Issue	Source Document(s) *(Explicitly identify that part of the record that would indicate there is a potential problem)*	Describe the concern	Potential Remedy	Potential to incur significant costs (> $0.5 million) Yes or No	Other Comments
1	Auxillary mechanical systems						
a	Station dewatering	Keep submerged portions of the powerhouse structure and equipment dry.	None	No detailed information from NW due diligence.		Unknown	
b	HVAC	Maintain powerhouse ambient temperature within acceptable range.	None	No detailed information from NW due diligence.		Unknown	
c	Powerhouse crane	Lifting/rigging capability to support maintenace activities.	None	No detailed information from NW due diligence.		Unknown	
d	*Other (list)*						
2	Gates & Valves						
a	Penstock headgate	Means of stopping flow into the penstock and/or turbine.	None	No detailed information from NW due diligence.		Unknown	
b	Unit dewatering gates/valves	Means of dewatering pressure case/draft tube to support maintenance activities.	None	No detailed information from NW due diligence.		Unknown	
c	HPU/accumulator	Hydraulic power to operate gates and valves.	None	No detailed information from NW due diligence.		Unknown	
d	*Other (list)*						
3	Governor System						
a	Full governor/gate actuator	Means of controlling wicket gates and water flow to the turbine runner.	WTR-2.1, page 71.			Unknown	Governor upgades "have been implemented". No other detailed information available.
b	Accumulator/emergency close	Means of closing wicket gates/penstock headgates in the event of loss of station service.	None	No detailed information from NW due diligence.		Unknown	
c	*Other (list)*						
4	Turbines		WTR-2.1, page 71.	Units went into service in 1915. No information on turbine overhauls or runner replacements. Reliability and level of performance is unknown.	Turbine overhauls including runner repair or replacement.	Yes	Six vertical Francis units , 1925 ISD. One vertical Kaplan (U7), 1995 ISD.
a	Bearings/alignment	Condition of wear surfaces, clearances,operating temperature, vibration and shaft alignment.	None	No detailed information from NW due diligence.		Unknown	
b	Pressure case	Structural integrity, metalurgical fatigue, ability to safely withstand normal and transient operating conditions.	None	No detailed information from NW due diligence.		Unknown	
c	Stay vanes & wicket gates	Condition, hydraulic profiles, wicket gate linkage and wicket gate pinch.	None	No detailed information from NW due diligence.		Unknown	
d	Runner	Structural integrity, cavitation damage, hydraulic profiles, metalurgical fatigue.	WTR-2.1, page 70.				U1 & U3 runners were replaced, date unknown.
e	Seal clearances/Headcover pressure	Excessive seal clearances result in decreased performance and increased pressure on headcover.	None	No detailed information from NW due diligence.		Unknown	
f	Draft tube	Structural integrity, hydraulic profile, maintain suction head for runners set above tailwater.	None	No detailed information from NW due diligence.		Unknown	

	Project/Development/FERC ID		Year Built	License Expiration			
	Thompson Falls Project/FERC No. 1869		1913-1916	12/3/2025			
No.	Item	Specific Issue	Source Document(s) *(Explicitly identify that part of the record that would indicate there is a potential problem)*	Describe the concern	Potential Remedy	Potential to incur significant costs (> $0.5 million) Yes or No	Other Comments
1	**Compliance with FERC License Order**						
a	Environmental requirements and management plans (WQ, fish and wildlife, recreation, lands, etc). Are there any outstanding compliance issues?	FERC licenses typicaly include specific environmental protection, mitigation, and enhancement (PM&E) measures.	Exhibit_(WTR-2.1), p 86-91 Exhibit_(WTR-2.3), p 12	None. Filings indicate the project is in compliance with license requirements.	NA	No	
b	Fish passage requirements (capital and operational)	The FERC license for Thompson Falls includes a specific requirement for construction and operation of a fish ladder.	Exhibit_(WTR-2.1), p 87-89	None. Filings state that the fish ladder has been constructed and is operating as designed.	NA	No	
c	Capital improvements for recreation facilities	FERC licenses frequently include specific recreational enhancement measures.	Exhibit_(WTR-2.1), p 89	None. Filings indicate the project is in compliance with license requirements for recreation.	NA	No	
d	Annual operating costs for environmental compliance (monitoring, etc)	Costs for license compliance are included in the annual O&M budget. Projected costs are based on historic costs.	Exhibit_(WTR-2.1), p 162, 168; Exhibit_(WTR-2.3), p 189; Exhibit__(JMS-1) and (JMS-2); Response to MCC-028; Response to PSC-181	There is insufficient information to determine if the projected O&M budget is adequate to cover future compliance needs.	Develop line-item budget projections per compliance requirement with a contingency.	Yes	
2	**FERC Relicensing (future exposure)**	Projects must be relicensed every 30-50 years, depending on the terms of the existing license. The Thompson Falls license expires in 2025. Licensing proceedings typically begin at least 5 years prior to licence expiration.	Exhibit_(WTR-2.3), p 12; Exhibit__(JMS-1) and (JMS-2); Response to PSC-181	Response to PSC-181 states that relicensing costs will be absorbed as part of annual O&M budget. There is insufficient information to determine if the projected O&M budget is adequate to cover future relicensing needs.	Budget additoinal resources in anticipation of relicensing costs.	Yes	
3	**Endangered Species Act**						
a	Existing listings and requirements	There may be special requirements for the protection of existing rare, threatened or endangered species affected by the project.	Exhibit_(WTR-2.1), p 87-89	None. Existing license and MOU include measures intended to protect listed Bull Trout and avoid jeapordy. It's uncertian if additional measures may be required in the future.	NA	No	
b	Exposure for future listings	Future ESA listings could result in new requirements being imposed on the project to protect rare, threatened or endangered species.	Exhibit_(WTR-2.1), p 87-90	None. Filings do not note any known potential future ESA listings that would affect the Thompson Falls Project.	NA	No	

No.	Item	Specific Issue	Source Document(s) *(Explicitly identify that part of the record that would indicate there is a potential problem)*	Describe the concern	Potential Remedy	Potential to incur significant costs (> $0.5 million) Yes or No	Other Comments
4	**EPA - Contamination and Super Fund Sites (human health and safety)**	Potential for contamination or other environmental health issues.	Exhibit_(WTR-2.3), p 13 Response to PSC-031 to PSC-080 Response	Filings describes ongoing washout from the Milltown Dam removal that accumulates and is annually dredged from the Unit 7 intake at Thompson Falls. They further indicate that dredge materials are stockpiled on site and that no information is available regarding sampling of this material. There is insuficent information to determine if the sediment and dredge material may present a human health risk or a cost exposure related to remediation and disposal. Future CapEx projections include $187,500 annually from 2021-2030 for this item.	Test material and develop a remediation plan as needed.	Yes	
5	**Historic Preservation and Tribal Issues**	FERC licenses often include specific measures to protect historic and cultural resources.	Exhibit_(WTR-2.1), p 89	None. Filings indicate the project is in compliance with license requirements.	NA	No	
6	**Water Rights**	Licensees must maintain adequate land and water rights to operate and maintain the project.	Exhibit_(WTR-2.1), p 88-87	None. Filings list water rights claims.	NA	No	