



Upper Reservoir

PROPOSED BIG RUN PUMP STORAGE HYDROPOWER PROJECT

FERC P-14889

Presentation to USFS Monongahela National Forest Supervisor

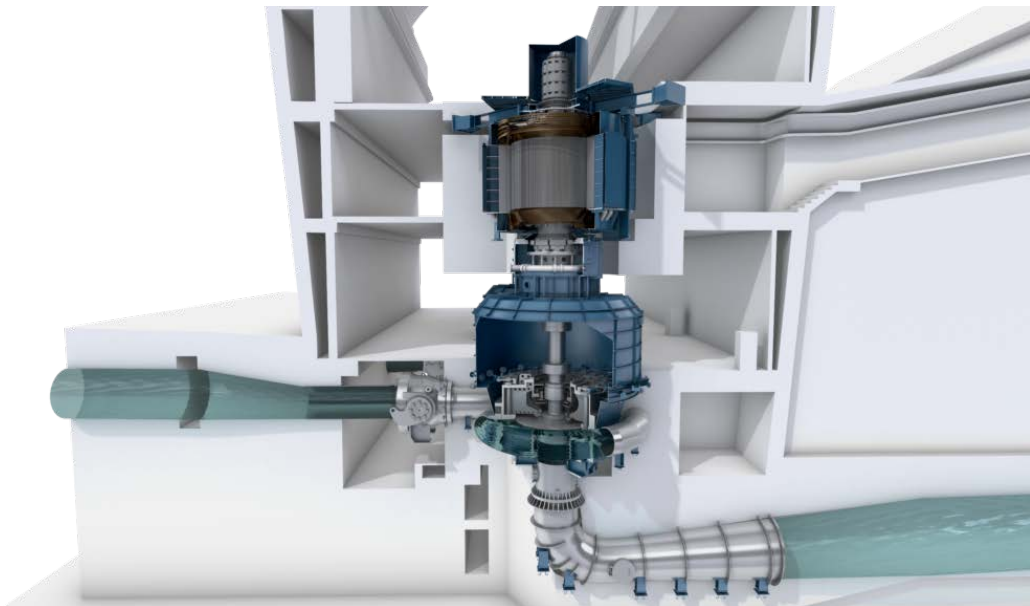


Lower Reservoir

WHAT IS PROPOSED BIG RUN PSH 100% RE PROJECT?

Proposed Big Run PSH is the next iteration in the evolution of 1 GW Pump Storage Hydropower Plants: Linthal, Nant-de-Drance (both Switzerland); and Tehri (India)

- 1: [What is Pump Storage Hydropower?](#)
- 2: [Linthal PSH Project Animation](#)
- 3: [Linthal PSH Project Overview Report](#)



BIG RUN PSH 100% RE – Executive Summary

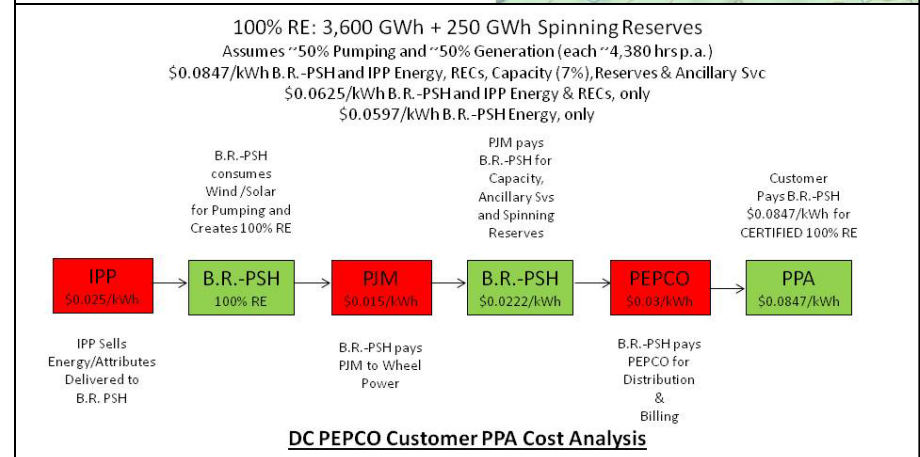
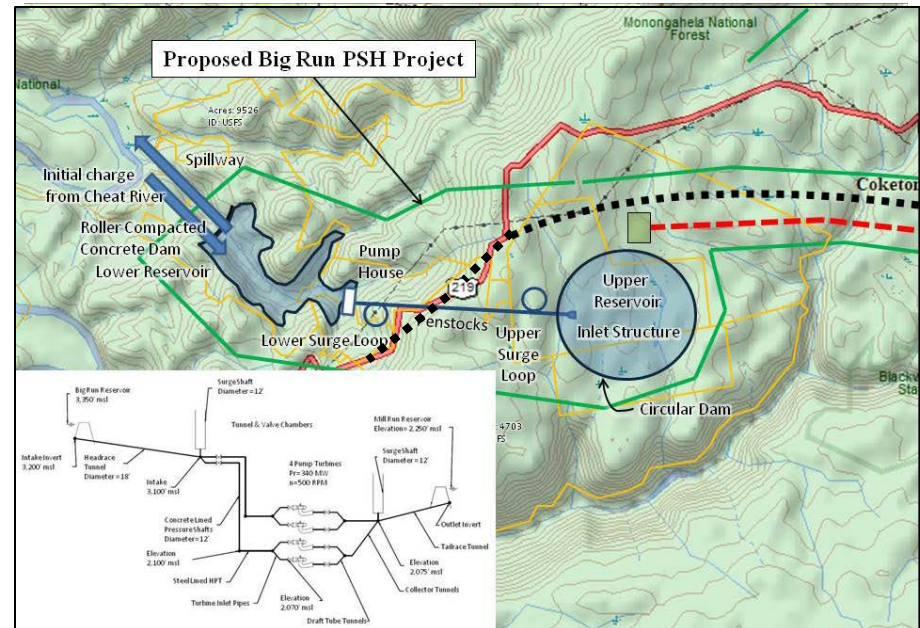
MATCHING BIG RUN PUMP-STORAGE HYDRO CAPABILITIES WITH THE HIGHEST VALUE PROJECTS

Technology Summary

- A lower-cost of energy when compared to existing
- A closed-loop PSH project that does not require FERC license
- A PSH system designed to generate 100% RE
- Extensive use of forecasting and IoT to plan and operate both storage and generation resources.
- Renewable Energy Storage available 24/365 p.a.
- Coordinated long-term wind and solar renewable energy supply, delivery and transmission contracts that provide shaped, firm, balanced, and dynamically scheduled energy built-in with ancillary services direct to Big Run PSH project customers

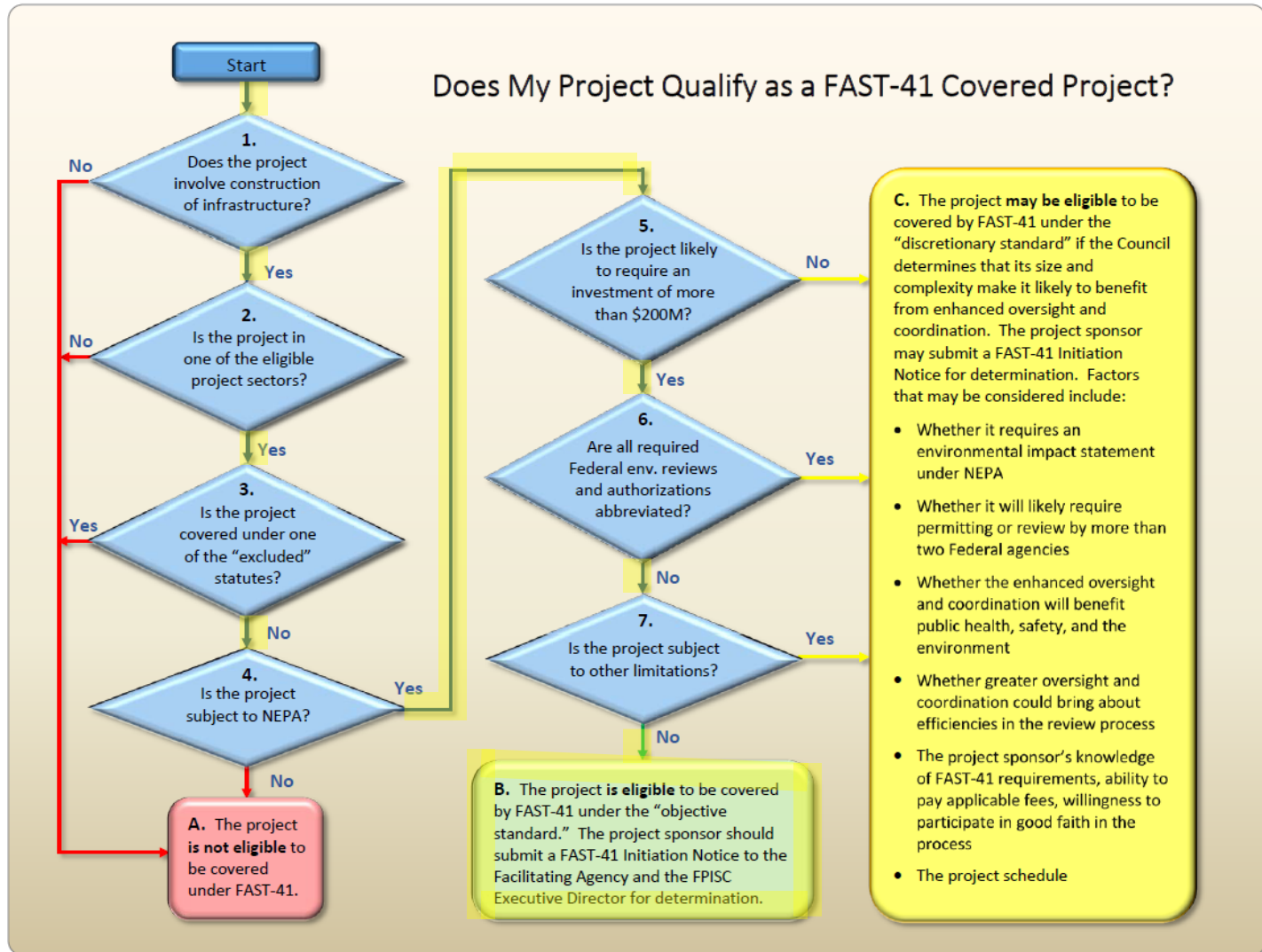
Proposed Targets (system or component)

Metric	State of the Art	Proposed
1. TBM costs	14' = \$250 M/mi	12' = \$100 M/mi
2. PSH Licensing	5-8 Years	3 Years
3. PSH Reservoirs	10 Hrs Storage	40 Hrs Storage
4. 100% RE	Offset Contract with Energy & REC	Renewable Energy, Capacity, Reserves & Ancillary Services
5. Master Supply Contract	vPPA	Coordinated Supply and Delivery
6. 100% RE REC	Renewable Energy, only	Renewable Energy, Capacity, Reserves & Ancillary Services



BIG RUN PSH 100% RE – FIN APPLICATION TO FAST41 PROGRAM

BIG RUN PSH PROJECT MEETS DEFINITION PER [42 U.S.C. §4370m\(6\)\(A\)](#) OF THE FAST ACT



Box 2: FAST-41 Eligible Sectors:

- Renewable Energy and Conventional Energy Production
- Electric Transmission
- Others sectors, including new sectors by a majority vote of the Federal Permitting Improvement Steering Council

BIG RUN PSH 100% RE – BUSINESS PLAN

MATCHING BIG RUN PUMP-STORAGE HYDRO CAPABILITIES WITH THE HIGHEST VALUE PROJECTS

Expressions of Interest in Supply/Off-Take: \$0

Utilities – Dominion & Exelon

IPPs & Corporate Customers

GSA under an SSPC Contract

Preliminary Studies – Working Capital \$0-\$1 million

EIS

Feasibility Studies

Letters of Support

Major Studies – Grants and Loans \$1-25 million

Engineering Design

Interconnection

Power Agreements

Tunneling Boring Machine (TBM)

Financial Close- \$1.2 Billion

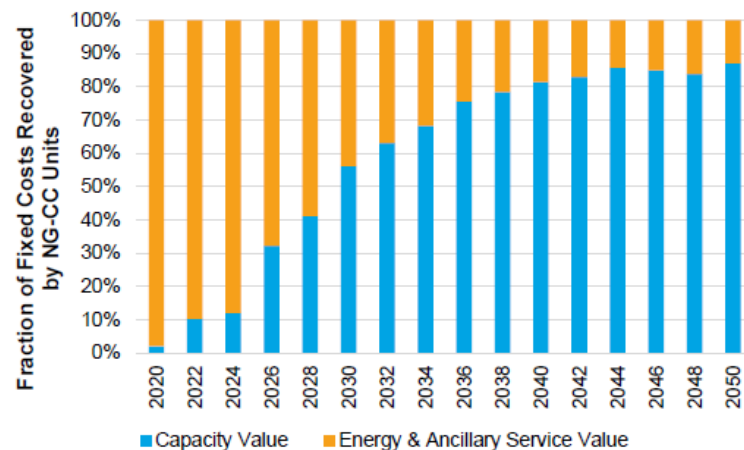
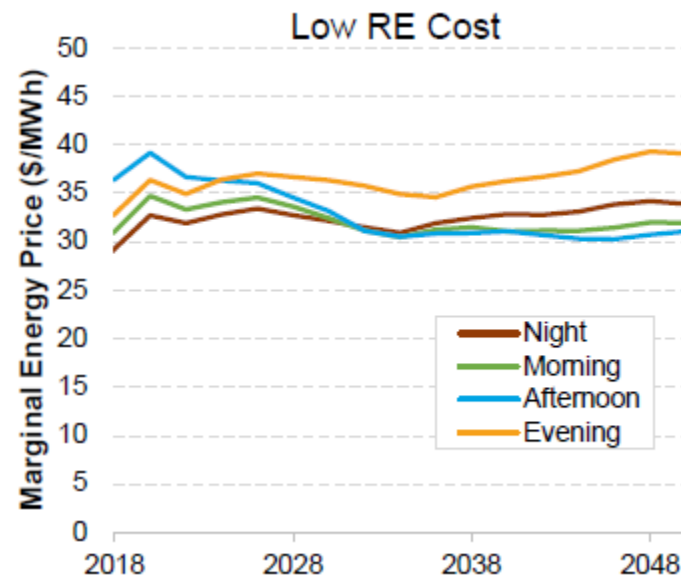
Fabrication

Transportation

Installation

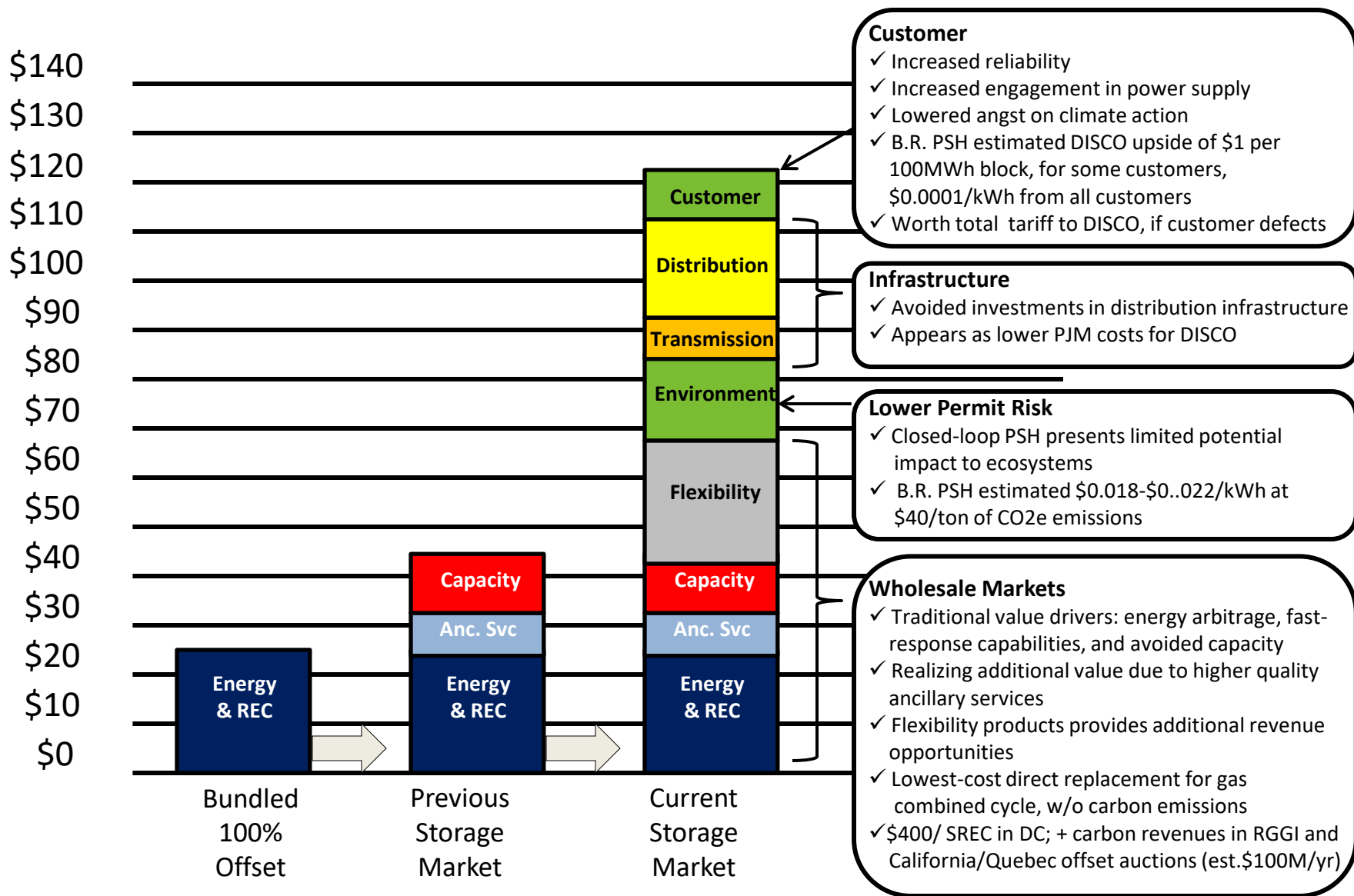
Commissioning

COD



BIG RUN PSH 100% RE - VALUE STREAMS

MATCHING BIG RUN PUMP-STORAGE HYDRO CAPABILITIES WITH THE HIGHEST VALUE PROJECTS

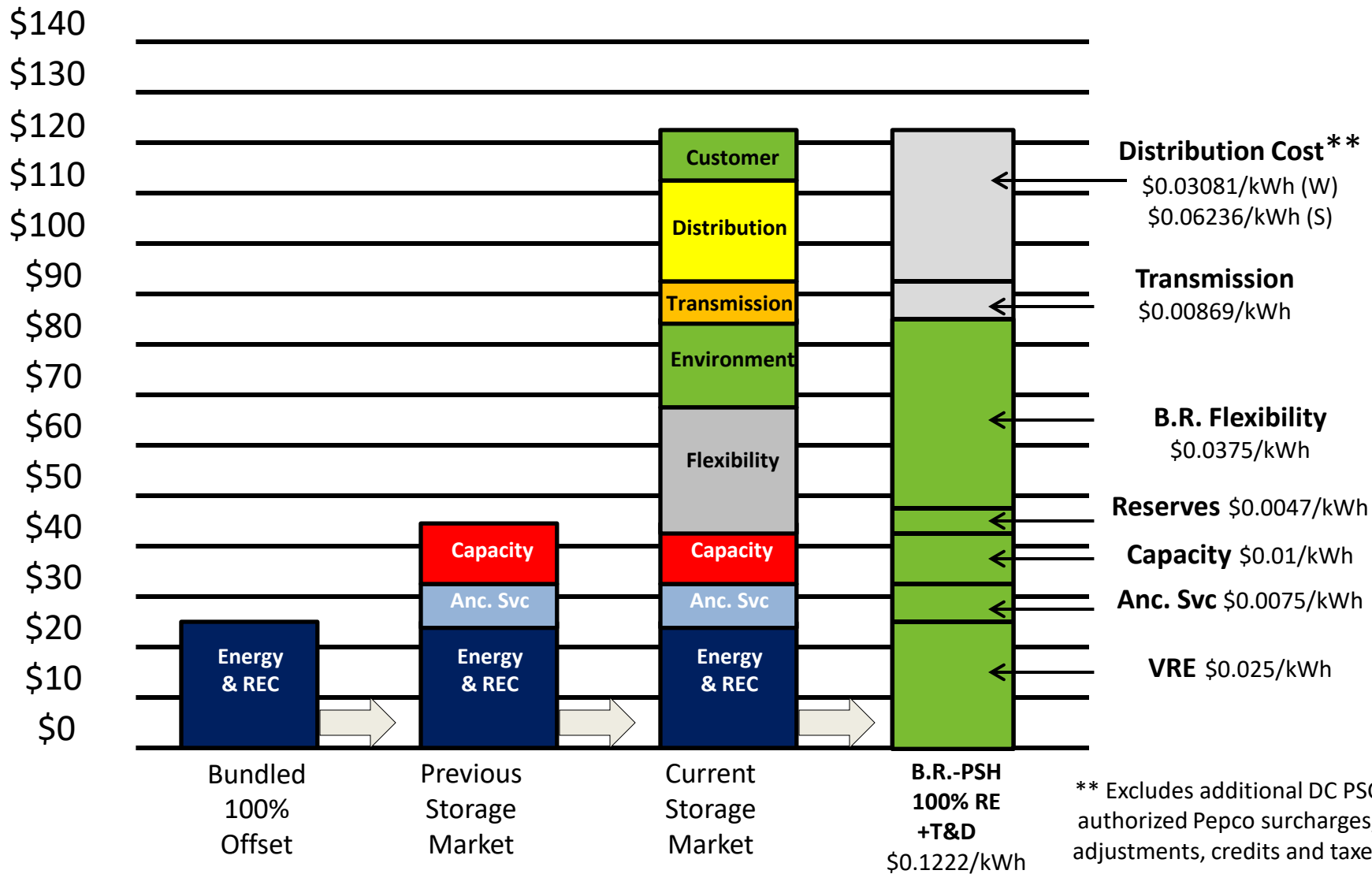


DC PEPCO Customer PPA Value Analysis

BIG RUN PSH 100% RE - VALUE STREAMS

THE HIGHEST VALUE RENEWABLES ENERGY PROJECTS & BIG RUN PUMP-STORAGE HYDROPOWER
IN PERFECT COMBINATION

MATCHING SUPPLY TO HOW DEMAND IS SHAPED ON THE GRID



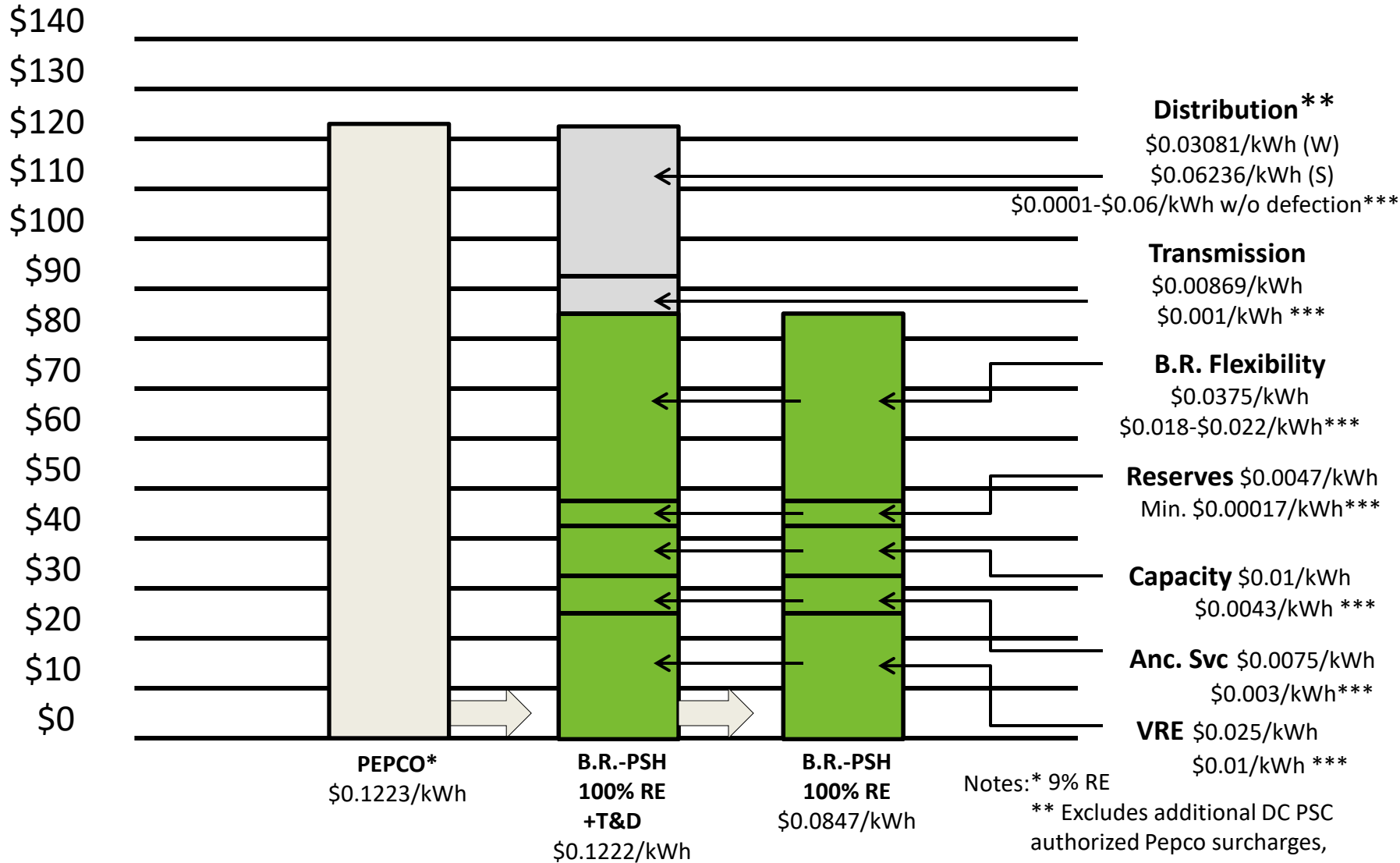
** Excludes additional DC PSC authorized Pepco surcharges, adjustments, credits and taxes

DC PEPCO Customer PPA Value-to-Cost Analysis

BIG RUN PSH 100% RE: 3,600 GWh/yr + 250 GWh Spinning Reserves

Assumes ~50% Pumping and ~50% Generation (each ~4,380 hrs p.a.)

\$0.0847/kWh B.R.-PSH Energy, RECs, Capacity (7%), Reserves & Ancillary Svc



DC PEPCO Customer PPA Cost Analysis

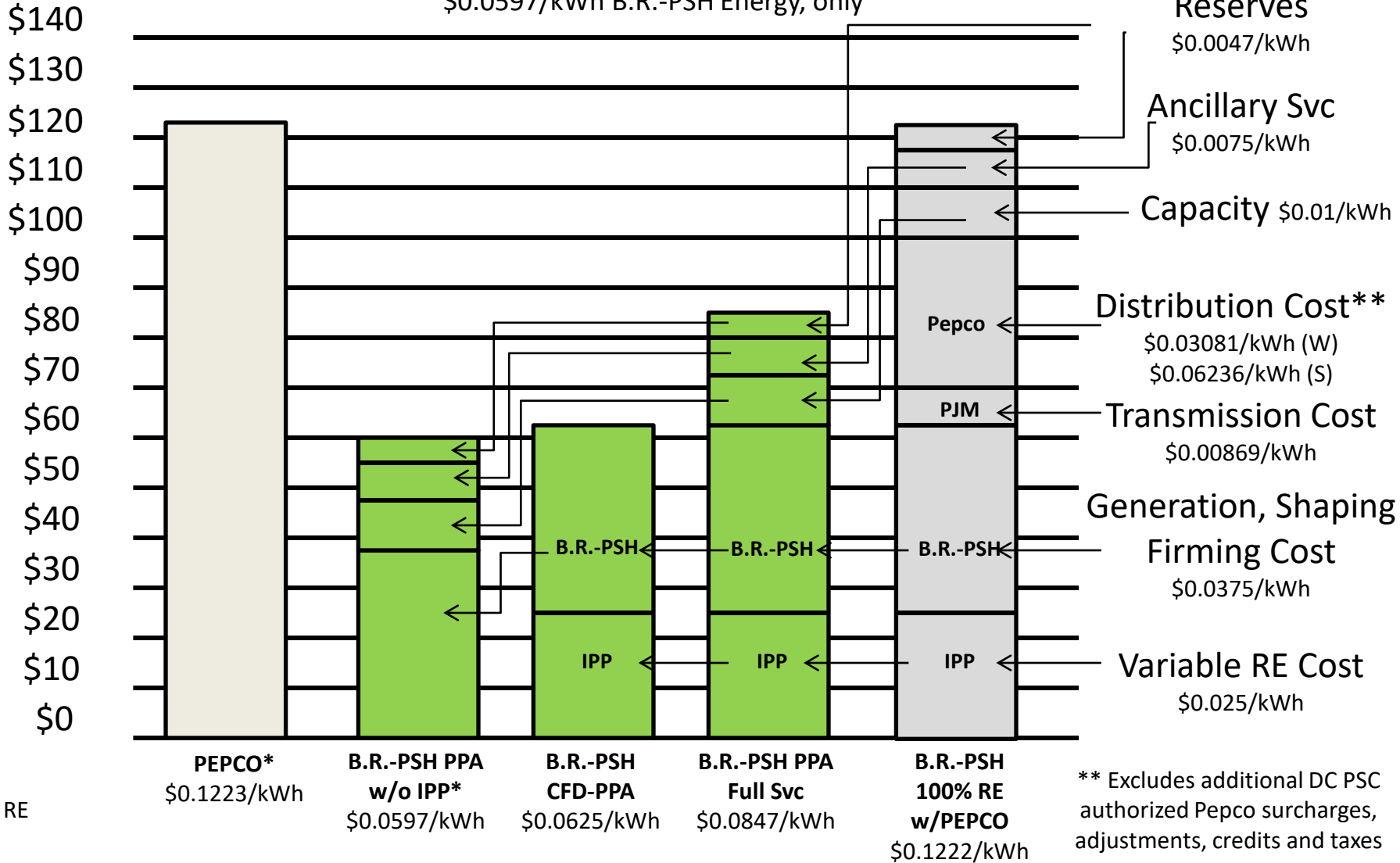
100% RE: 3,600 GWh + 250 GWh Spinning Reserves

Assumes ~50% Pumping and ~50% Generation (each ~4,380 hrs p.a.)

\$0.0847/kWh B.R.-PSH & IPP Energy, RECs, Capacity (7%), Reserves & Ancillary Svc

\$0.0625/kWh B.R.-PSH and IPP Energy & RECs, only

\$0.0597/kWh B.R.-PSH Energy, only



* 9% RE

** Excludes additional DC PSC authorized Pepco surcharges, adjustments, credits and taxes

DC PEPCO Customer PPA Cost Analysis

BIG RUN PSH 100% RE – SPECIAL USE PERMIT STUDY PLAN

U.S. Fish & Wildlife Service

Preliminary Species of Concern:

1. Running Buffalo Clover - *Trifolium stoloniferum*
2. Small Whorled Pogonia - *Isotria medeoloides*

Potential Species of Concern:

3. Cheat Mountain Salamander - *Plethodon nettingi*
4. Indiana Bat - *Myotis sodalis*
5. Northern Long-eared Bat - *Myotis septentrionalis*
6. Virginia Big-eared Bat - *Corynorhinus (=Plecotus) townsendii virginianus*
7. Others?

FreedomWorks' Study Plan insurance limits/capacity:

E. & O.:	<u>\$3,000,000</u>
Auto:	<u>\$1,000,000</u>
General Liability:	<u>\$1,000,000/\$2,000,000</u>
Excess Liability:	<u>\$10,000,000</u>

Big Run Pump Storage Hydro

Species Survey Guidelines (2 Species)

Generated November 11, 2018 08:16 AM MST, IPaC v unspecified

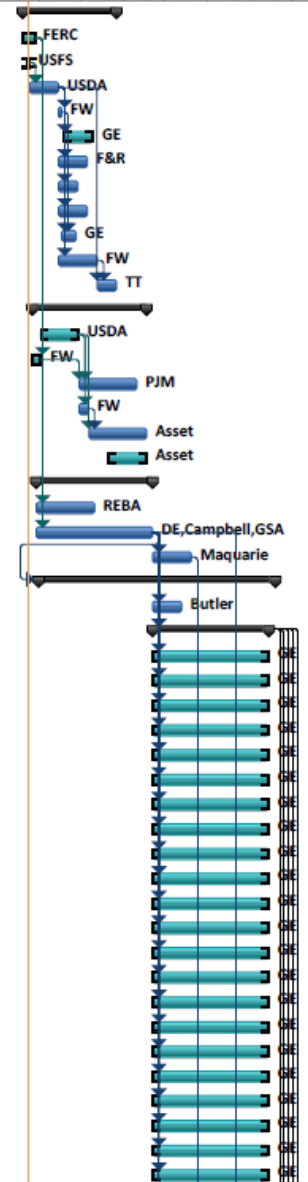


IPaC - Information for Planning and Consultation (<https://ecos.fws.gov/ipac/>): A project planning tool to help streamline the U.S. Fish and Wildlife Service environmental review process.

Big Run Special Use permit Study Plans shall include USFS intervention comments dated November, 16, 2018. All MNF Study Plans are contingent upon USFS approvals

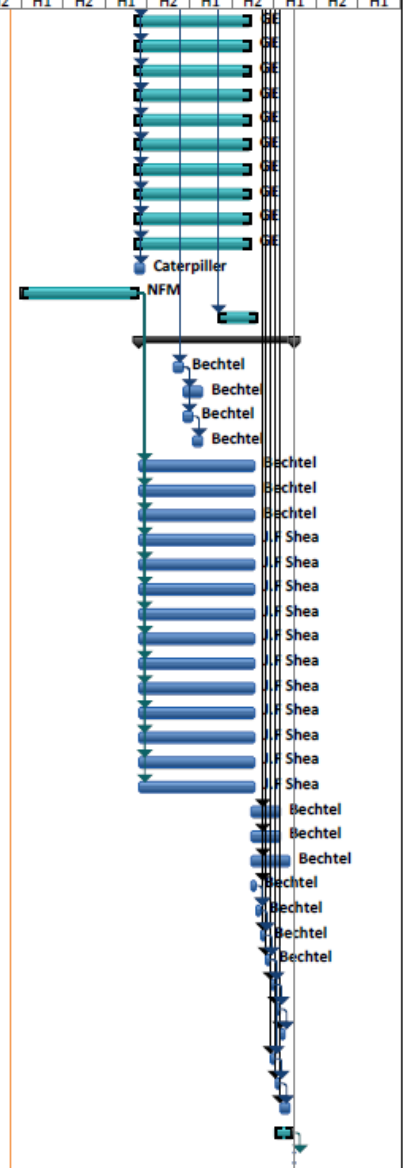
BIG RUN PSH 100% RE – CONSTRUCTION PLAN

Preliminary Big Run Pump Storage Hydropower Project Schedule											2018					2019				2020		2021		2022		2023
ID	Task Name	Duration	Start	Finish	Predecessors	Resource Names	Baseline1 Cost	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1						
1	Pre-development PH1	291 days	Mon 10/22/18	Mon 12/2/19			\$228,500.00																			
2	FERC Preliminary Permit	43 days	Mon 10/22/18	Wed 12/19/18		FERC	\$0.00																			
3	USFS Initial Scoping Meeting	1 day	Mon 11/19/18	Mon 11/19/18		USFS	\$0.00																			
4	Preliminary Funding for Project Feasibility	90 days	Tue 11/20/18	Mon 3/25/19	3	USDA	\$228,500.00																			
5	General Plan	10 days	Tue 3/26/19	Mon 4/8/19	4	FW	\$10,000.00																			
6	Engineering Optimization Studies	90 days	Fri 4/19/19	Thu 8/22/19	4	GE	\$0.00																			
7	Geotechnical Studies	90 days	Tue 3/26/19	Mon 7/29/19	4	F&R	\$90,000.00																			
8	Water Quality Studies	60 days	Tue 3/26/19	Mon 6/17/19	4		\$1,000.00																			
9	Recreation Studies	90 days	Tue 3/26/19	Mon 7/29/19	4		\$7,500.00																			
10	Preliminary Design Studies	45 days	Tue 4/9/19	Mon 6/10/19	4,5	GE	\$35,000.00																			
11	Economic and Market Analysis	120 days	Tue 3/26/19	Mon 9/9/19	4	FW	\$35,000.00																			
12	Project Feasibility Report	60 days	Tue 9/10/19	Mon 12/2/19	4,11	TT	\$50,000.00																			
13	Pre-development PH2	355 days	Mon 12/3/18	Fri 4/10/20			\$0.00																			
14	Funding for Exploration and Design	120 days	Mon 1/7/19	Fri 6/21/19		USDA	\$25,000,000.00																			
15	LGIP Interconnection Request	30 days	Mon 12/3/18	Fri 1/11/19	2	FW	\$20,000.00																			
16	Facility and System Impact Studies	180 days	Mon 6/24/19	Fri 2/28/20	15,14	PJM	\$300,000.00																			
17	Exploration	30 days	Mon 6/24/19	Fri 8/2/19	14	FW	\$10,000.00																			
18	Facilities Design, Engineering, and Approvals	180 days	Mon 8/5/19	Fri 4/10/20	14,17	Asset	\$3,000,000.00																			
19	Cost Estimating and Financial Planning	120 days	Mon 10/28/19	Fri 4/10/20		Asset	\$70,000.00																			
20	PPA Power Marketing Supply/Off-take Sales	360 days	Thu 12/20/18	Wed 5/6/20			\$0.00																			
21	Wind and Solar Supply Contracts	180 days	Thu 12/20/18	Wed 8/28/19	2	REBA	\$350,000.00																			
22	Big Run-PSH Off-take Contracts	360 days	Thu 12/20/18	Wed 5/6/20	2	DE,Campbell,GSA	\$350,000.00																			
23	Financial Close on Construction Funding	120 days	Thu 5/7/20	Wed 10/21/20	22	Maquarie	\$800,000,000.00																			
24	BOP Procurement	733 days	Mon 12/31/18	Wed 10/20/21	22		\$0.00																			
25	Facility Building	90 days	Thu 5/7/20	Wed 9/9/20	22	Butler	\$300,000.00																			
26	Mechanical-Electrical Equipment	360 days	Thu 5/7/20	Wed 9/22/21	22		\$0.00																			
27	Butterfly Valves, Accessories and Aux. Equipment	360 days	Thu 5/7/20	Wed 9/22/21	22	GE	\$0.00																			
28	Pump Turbines (4 ea- 340/250 MW, 500 rpm)	360 days	Thu 5/7/20	Wed 9/22/21	22	GE	\$0.00																			
29	Electronic Speed Governors	360 days	Thu 5/7/20	Wed 9/22/21	22	GE	\$0.00																			
30	Main Inlet Spherical Valves	360 days	Thu 5/7/20	Wed 9/22/21	22	GE	\$0.00																			
31	Unit Cooling Water System	360 days	Thu 5/7/20	Wed 9/22/21	22	GE	\$0.00																			
32	Compressed Air System for Powerhouse	360 days	Thu 5/7/20	Wed 9/22/21	22	GE	\$0.00																			
33	Dewatering and Drainage System for Powerhouse	360 days	Thu 5/7/20	Wed 9/22/21	22	GE	\$0.00																			
34	Fire Detection & Fire Protection Equipment	360 days	Thu 5/7/20	Wed 9/22/21	22	GE	\$0.00																			
35	HVAC System incl. Smoke Evacuation	360 days	Thu 5/7/20	Wed 9/22/21	22	GE	\$0.00																			
36	Oil Handling System	360 days	Thu 5/7/20	Wed 9/22/21	22	GE	\$0.00																			
37	Powerhouse Gantry Cranes	360 days	Thu 5/7/20	Wed 9/22/21	22	GE	\$0.00																			
38	Butterfly Valve Gantry Cranes	360 days	Thu 5/7/20	Wed 9/22/21	22	GE	\$0.00																			
39	Elevators	360 days	Thu 5/7/20	Wed 9/22/21	22	GE	\$0.00																			
40	Material Handling Equipment	360 days	Thu 5/7/20	Wed 9/22/21	22	GE	\$0.00																			
41	VA Dbl. Fed Asynchronous VS Generators w/SC Mode	360 days	Thu 5/7/20	Wed 9/22/21	22	GE	\$0.00																			
42	Excitation System & Static Voltage Source Inverter	360 days	Thu 5/7/20	Wed 9/22/21	22	GE	\$0.00																			
43	Isolated Phase Bus Duct	360 days	Thu 5/7/20	Wed 9/22/21	22	GE	\$0.00																			
44	Generator Circuit Breakers	360 days	Thu 5/7/20	Wed 9/22/21	22	GE	\$0.00																			
45	3-Phase GSU Transformers (? MVA-500 MVA)	360 days	Thu 5/7/20	Wed 9/22/21	22	GE	\$0.00																			
46	Connections & T-line from GSU Transformers & Mt. Storm S	360 days	Thu 5/7/20	Wed 9/22/21	22	GE	\$0.00																			
47	500 kV Bus Duct	360 days	Thu 5/7/20	Wed 9/22/21	22	GE	\$0.00																			
48	230 kV GSU Transformers and Connectors (Option)	360 days	Thu 5/7/20	Wed 9/22/21	22	GE	\$0.00																			

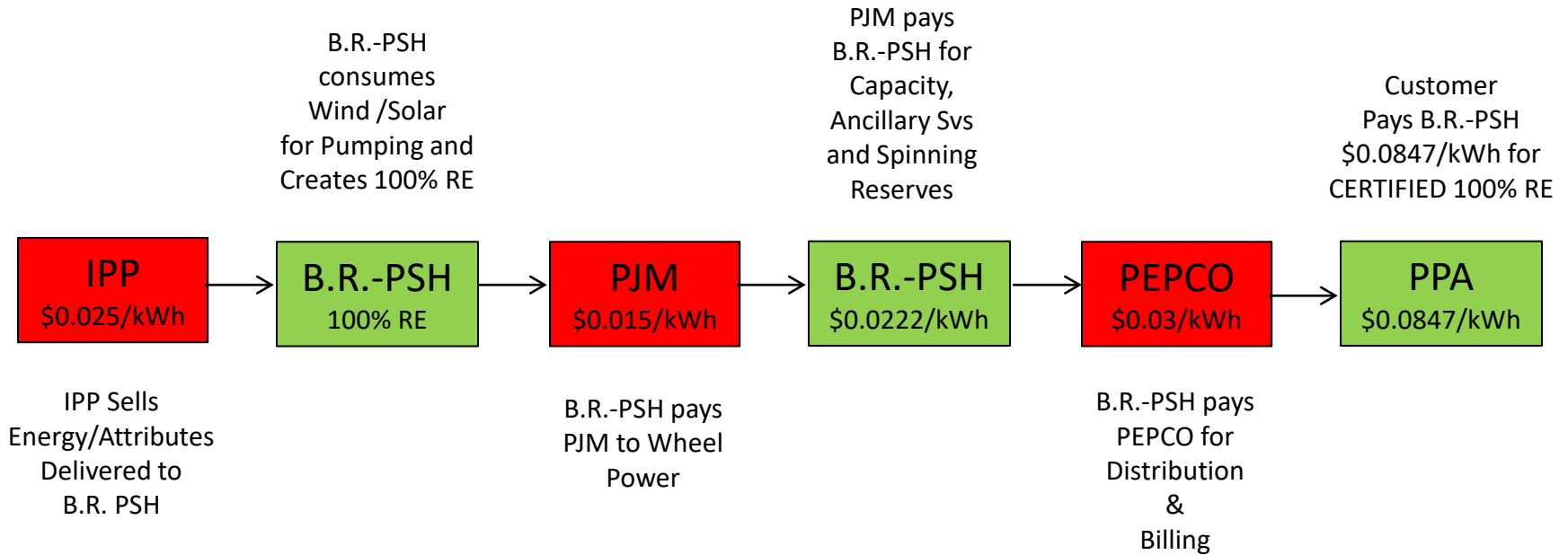


BIG RUN PSH 100% RE – CONSTRUCTION PLAN

Preliminary Big Run Pump Storage Hydropower Project Schedule																		
ID	Task Name	Duration	Start	Finish	Predecessors	Resource Names	Baseline1 Cost	2018		2019		2020		2021		2022		2023
								H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1
49	MV and LV Panels	360 days	Thu 5/7/20	Wed 9/22/21	22	GE	\$0.00											
50	DC Auxiliaries and UPS	360 days	Thu 5/7/20	Wed 9/22/21	22	GE	\$0.00											
51	Communications Systems	360 days	Thu 5/7/20	Wed 9/22/21	22	GE	\$0.00											
52	Network Protection System	360 days	Thu 5/7/20	Wed 9/22/21	22	GE	\$0.00											
53	Auxiliary Control & Protection System	360 days	Thu 5/7/20	Wed 9/22/21	22	GE	\$0.00											
54	Plant Computer Control & SCADA System	360 days	Thu 5/7/20	Wed 9/22/21	22	GE	\$0.00											
55	Indoor and Outdoor Lighting and Load Bank	360 days	Thu 5/7/20	Wed 9/22/21	22	GE	\$0.00											
56	Power and Control Network Cabling	360 days	Thu 5/7/20	Wed 9/22/21	22	GE	\$0.00											
57	Lightning Protection and Grounding System	360 days	Thu 5/7/20	Wed 9/22/21	22	GE	\$0.00											
58	Spare GSU Transformers	360 days	Thu 5/7/20	Wed 9/22/21	22	GE	\$0.00											
59	Civil Equipment	30 days	Thu 5/7/20	Wed 6/17/20	22	Caterpillar	\$0.00											
60	TBM procurement	365 days	Mon 12/31/18	Fri 5/22/20		NFM	\$0.00											
61	Transportation Services Contract	120 days	Thu 5/6/21	Wed 10/20/21	22FS+260 days		\$7,000,000.00											
62	Construction	481 days	Mon 5/25/20	Mon 3/28/22			\$0.00											
63	Access Road Upgrades	30 days	Thu 10/22/20	Wed 12/2/20	23	Bechtel	\$0.00											
64	Shaft Construction	60 days	Thu 12/3/20	Wed 2/24/21	63	Bechtel	\$0.00											
65	Access Road 2	30 days	Thu 12/3/20	Wed 1/13/21	63	Bechtel	\$0.00											
66	Access Road 3	30 days	Thu 1/14/21	Wed 2/24/21	65	Bechtel	\$0.00											
67	Emergency Egress and Ventilation Tunnels	360 days	Mon 5/25/20	Fri 10/8/21	60	Bechtel	\$0.00											
68	Upper Intakes	360 days	Mon 5/25/20	Fri 10/8/21	60	Bechtel	\$0.00											
69	Lower Intakes	360 days	Mon 5/25/20	Fri 10/8/21	60	Bechtel	\$0.00											
70	Tailrace Tunnels (TBM)	360 days	Mon 5/25/20	Fri 10/8/21	60	J.F Shea	\$0.00											
71	Headrace Tunnels (TBM)	360 days	Mon 5/25/20	Fri 10/8/21	60	J.F Shea	\$0.00											
72	Headrace Surge Loops (TBM)	360 days	Mon 5/25/20	Fri 10/8/21	60	J.F Shea	\$0.00											
73	Headrace Distributer Tunnels (TBM)	360 days	Mon 5/25/20	Fri 10/8/21	60	J.F Shea	\$0.00											
74	Headrace valve chamber (TBM)	360 days	Mon 5/25/20	Fri 10/8/21	60	J.F Shea	\$0.00											
75	Pressure Shafts (TBM)	360 days	Mon 5/25/20	Fri 10/8/21	60	J.F Shea	\$0.00											
76	Pressure Tunnels (TBM)	360 days	Mon 5/25/20	Fri 10/8/21	60	J.F Shea	\$0.00											
77	Penstock Tunnels (TBM)	360 days	Mon 5/25/20	Fri 10/8/21	60	J.F Shea	\$0.00											
78	Draft Tube Tunnels (TBM)	360 days	Mon 5/25/20	Fri 10/8/21	60	J.F Shea	\$0.00											
79	Collector Tunnels (TBM)	360 days	Mon 5/25/20	Fri 10/8/21	60	J.F Shea	\$0.00											
80	Tailrace Surge Loops (TBM)	360 days	Mon 5/25/20	Fri 10/8/21	60	J.F Shea	\$0.00											
81	Machine Hall Construction	90 days	Thu 9/23/21	Wed 1/26/22	26	Bechtel	\$0.00											
82	Substation Yard Construction	90 days	Thu 9/23/21	Wed 1/26/22	26	Bechtel	\$0.00											
83	Electrical and Mechanical Installations	120 days	Thu 9/23/21	Wed 3/9/22	26	Bechtel	\$0.00											
84	Pump Turbine One Installation	15 days	Thu 9/23/21	Wed 10/13/21	26	Bechtel	\$0.00											
85	Pump Turbine Two Installation	15 days	Thu 10/14/21	Wed 11/3/21	26,84	Bechtel	\$0.00											
86	Pump Turbine Three Installation	15 days	Thu 11/4/21	Wed 11/24/21	26,85	Bechtel	\$0.00											
87	Pump Turbine Four Installation	15 days	Thu 11/25/21	Wed 12/15/21	26,86	Bechtel	\$0.00											
88	Pump Turbine Five Installation (Option)	15 days	Thu 12/16/21	Wed 1/5/22	26,87		\$0.00											
89	Pump Turbine Six Installation (Option)	15 days	Thu 1/6/22	Wed 1/26/22	26,88		\$0.00											
90	Pump Turbine Seven Installation (Option)	15 days	Thu 1/27/22	Wed 2/16/22	26,89		\$0.00											
91	Pump Turbine Eight Installation (Option)	15 days	Thu 12/16/21	Wed 1/5/22	26,87		\$0.00											
92	Main Inlet Valves	15 days	Thu 1/6/22	Wed 1/26/22	26,91		\$0.00											
93	BOP Equipment Installation	30 days	Thu 1/27/22	Wed 3/9/22	26,92		\$0.00											
94	Testing and Commissioning	60 days	Mon 1/3/22	Fri 3/25/22			\$0.00											
95	COD	1 day	Mon 3/28/22	Mon 3/28/22	94		\$0.00											

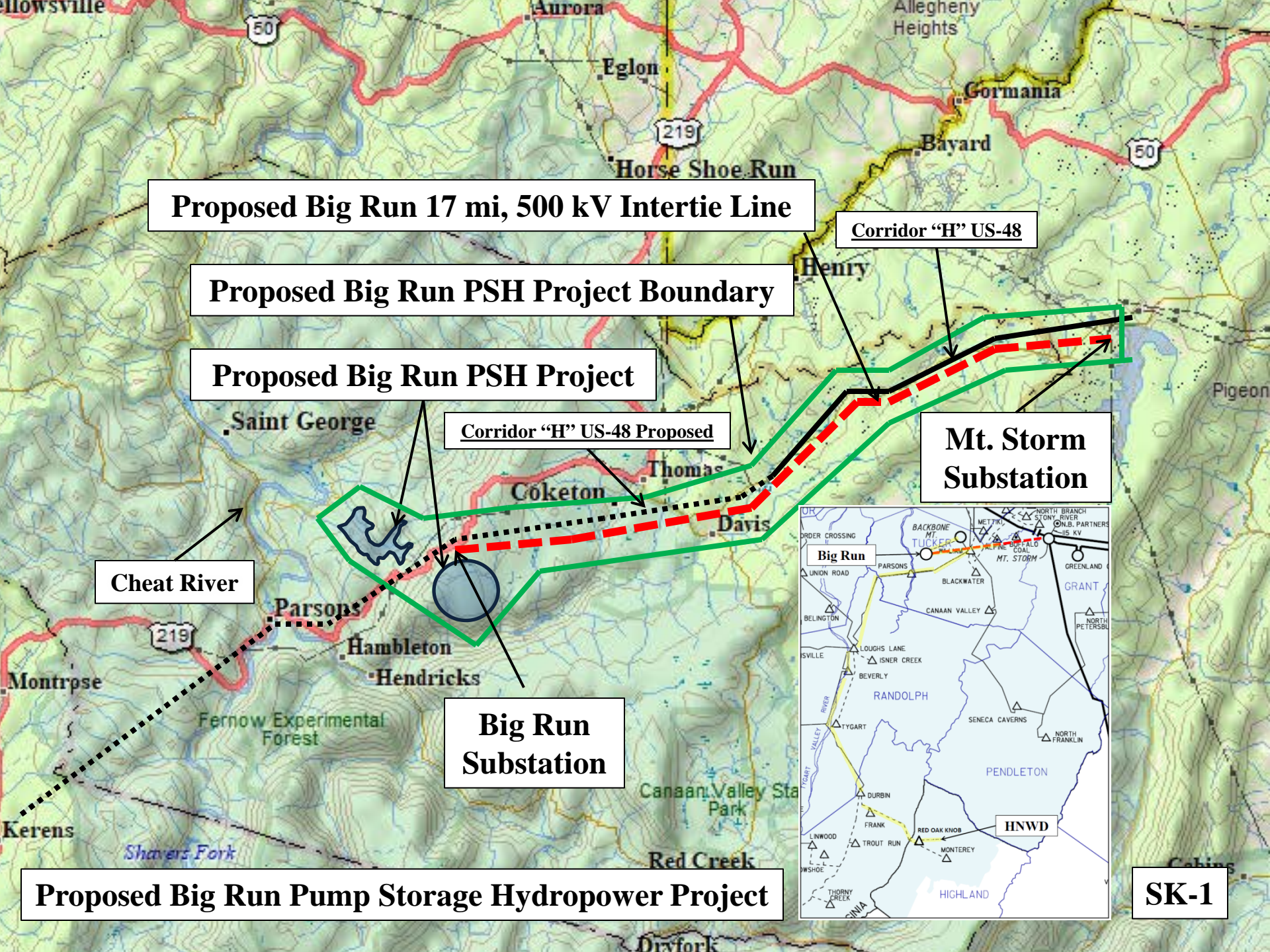


BIG RUN PSH 100% RE – OPERATIONS PLAN



General Solicitation for Offers (SFO)	Delivery Locations	Target 3600 GWh
20 YR Power Share/Purchase of Intermittent RE and REC	PJM WV Mt. Storm Node	\$0.025/kWh
20 YR Power Retail Sale of Flexible 100% RE, only	PJM beginning 2023	\$0.0597/kWh
20 YR Power Retail Sale of 100%RE and REC	PJM beginning 2023	\$0.0625/kWh
20 YR Power Retail Sale of 100%RE, REC, Capacity, Regulation, Reserves & Ancillary Svc	PJM beginning 2023	\$0.0847/kWh

DC PEPCO Customer PPA Cost Analysis



Proposed Big Run 17 mi, 500 kV Intertie Line

Proposed Big Run PSH Project Boundary

Proposed Big Run PSH Project

Corridor "H" US-48

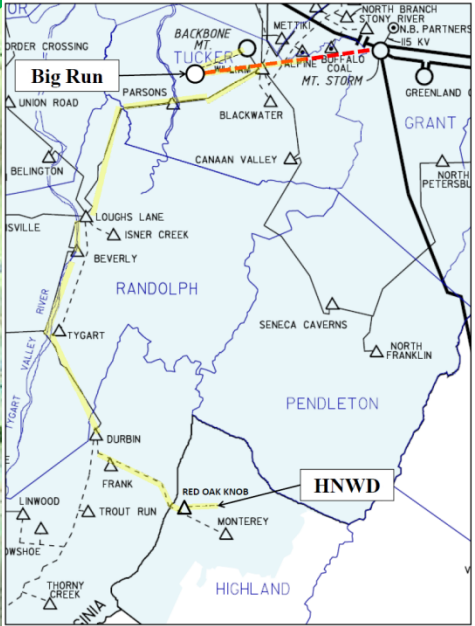
Corridor "H" US-48 Proposed

Mt. Storm Substation

Cheat River

Big Run Substation

Proposed Big Run Pump Storage Hydropower Project



SK-1

Proposed Big Run PSH Project Boundary

Corridor "H" Proposed Pathway

Big Run Substation

Acres: 9526
ID: USFS

Initial charge
from Cheat River

Spillway

Roller Compacted
Concrete Dam

Lower Reservoir

Pump
House

Lower Surge Loop

Penstocks

Upper
Surge
Loop

Upper
Reservoir
Inlet Structure

Circular Dam

Cheat River

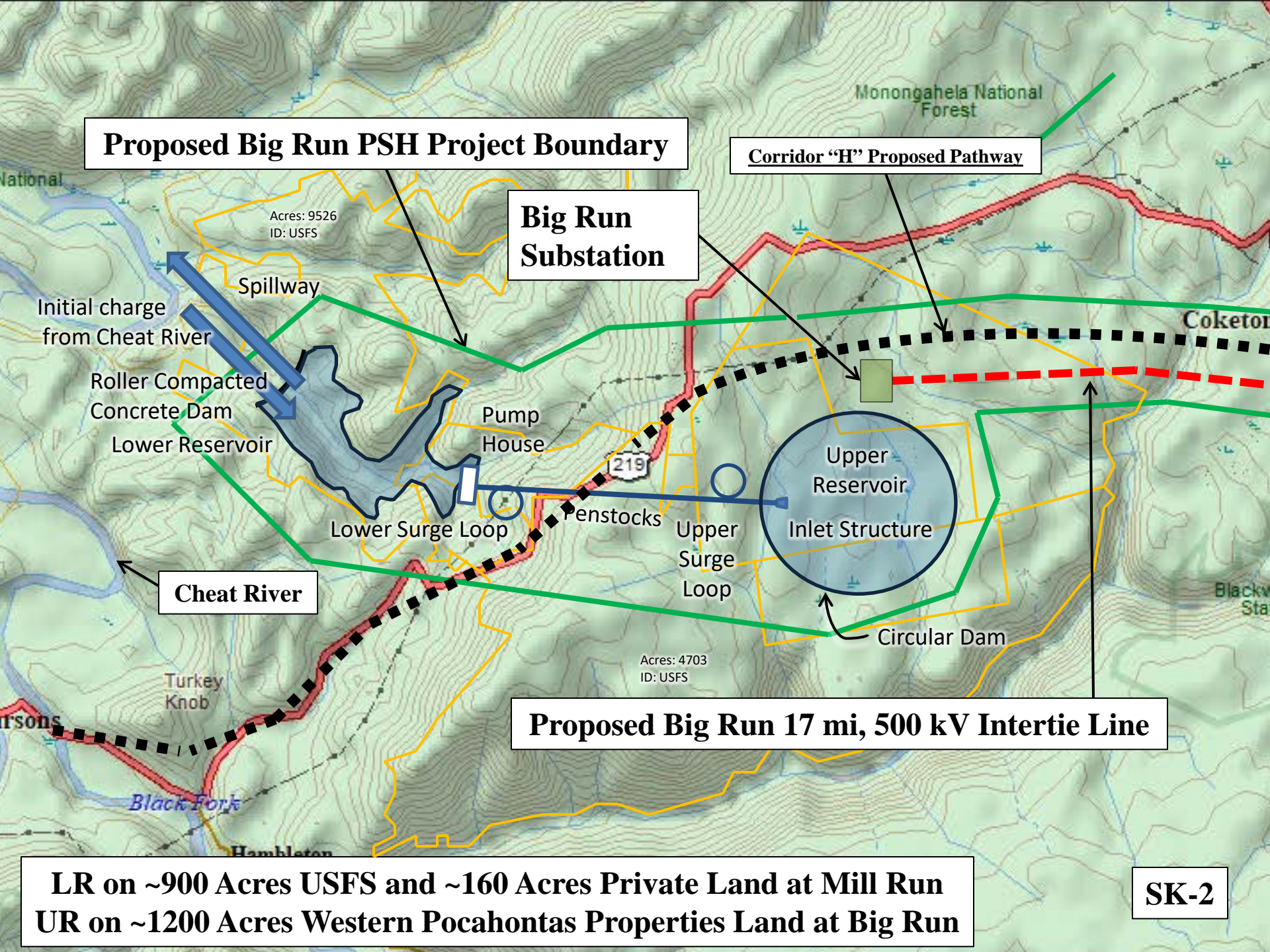
Turkey
Knob

Acres: 4703
ID: USFS

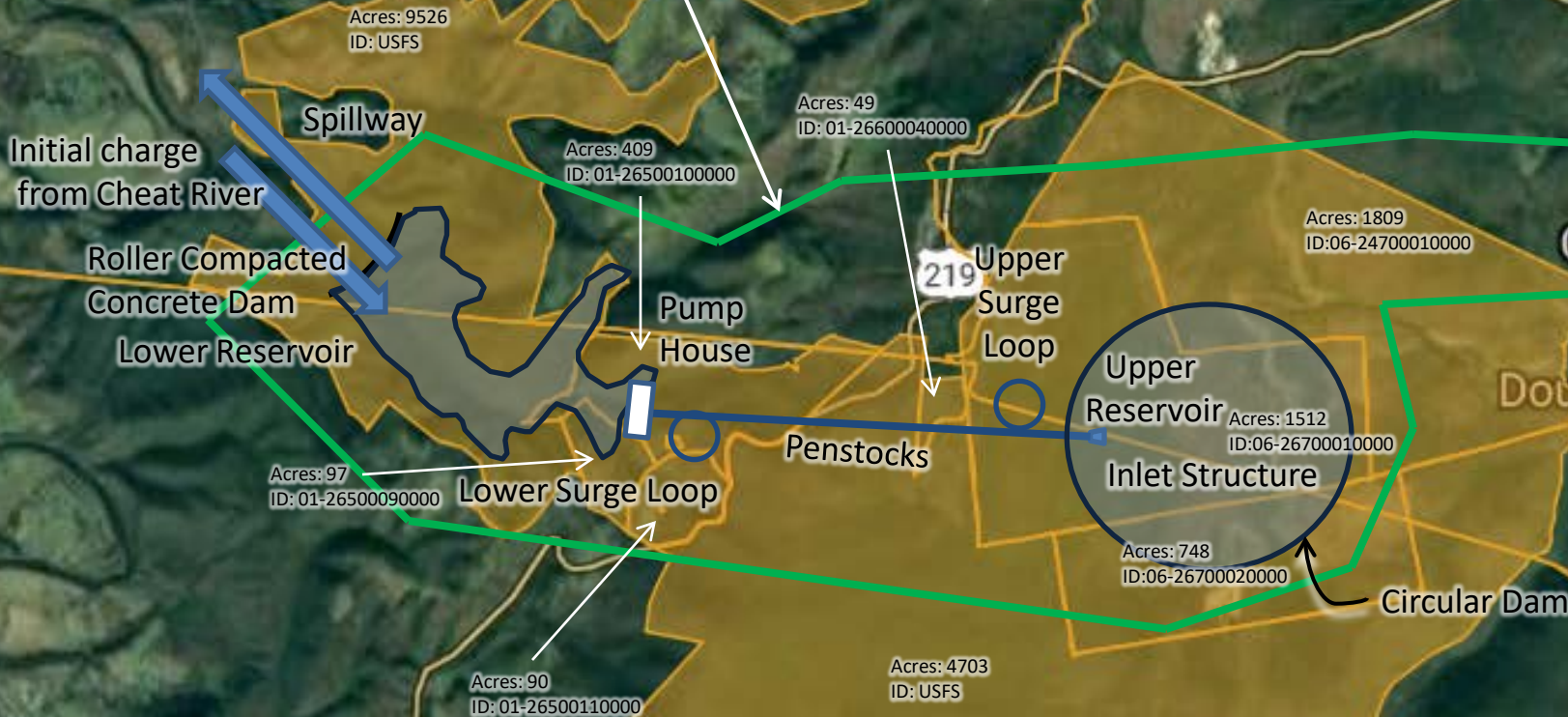
Proposed Big Run 17 mi, 500 kV Intertie Line

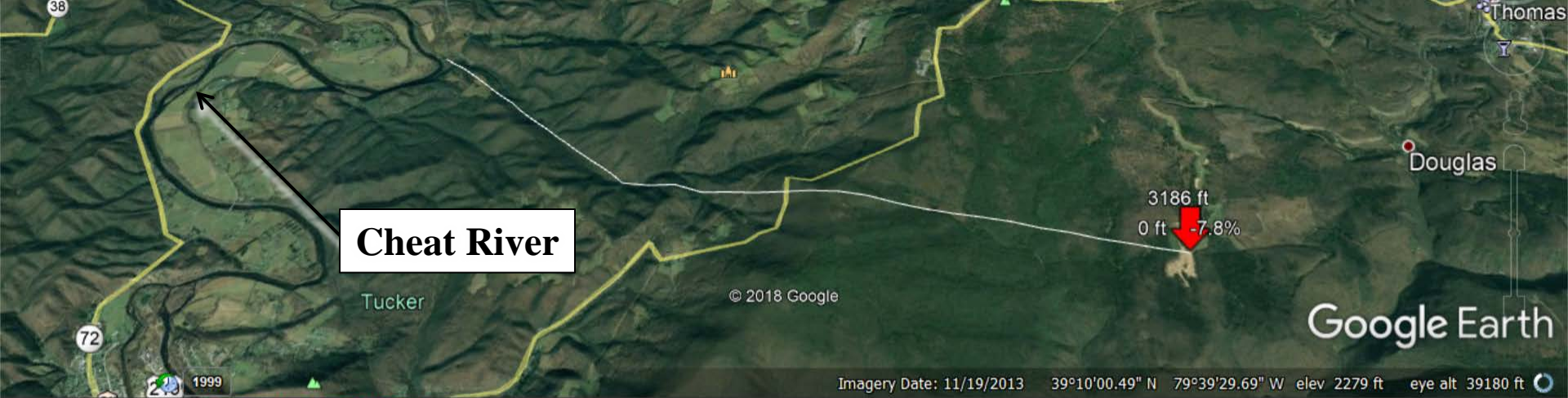
**LR on ~900 Acres USFS and ~160 Acres Private Land at Mill Run
UR on ~1200 Acres Western Pocahontas Properties Land at Big Run**

SK-2

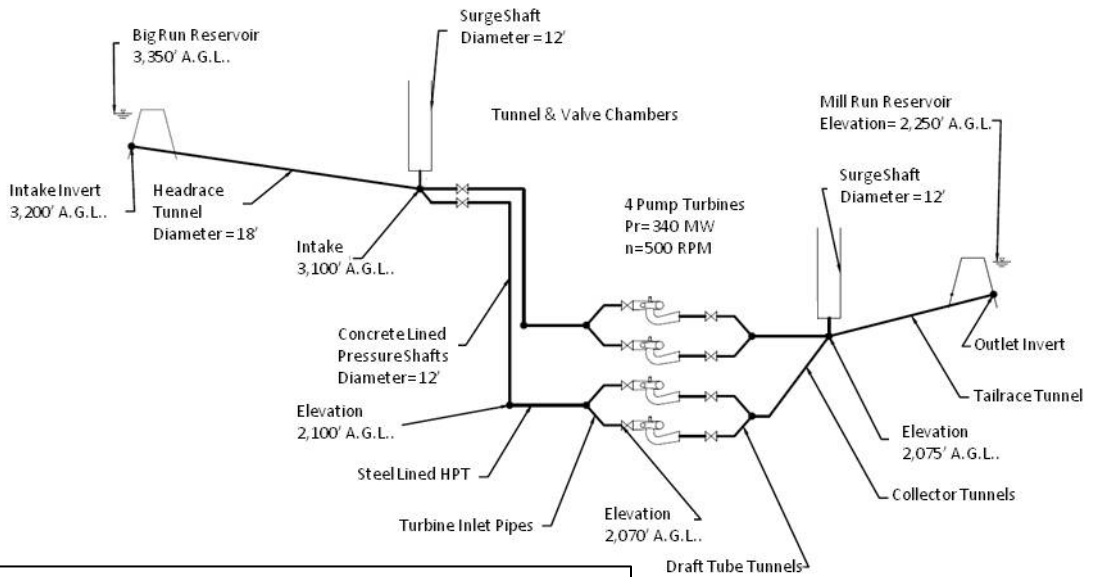


Proposed Big Run PSH Project Boundary





Graph: Min. Avg. Max Elevation: 1579, 2582, 3483 ft
 Range Totals: Distance: 6.09 mi Elev Gain/Loss: 1401 ft, -3008 ft Max Slope: 51.0%, -45.4% Avg Slope: 10.4%, -14.2%



Big Run Project Schematic & Section



Big Run Upper Reservoir: Cylinder

Maximum Area = 4,910,000 m²

Or, maximum 1213 acres water at 3,350' msl

Maximum Volume = 147,262,155 m³

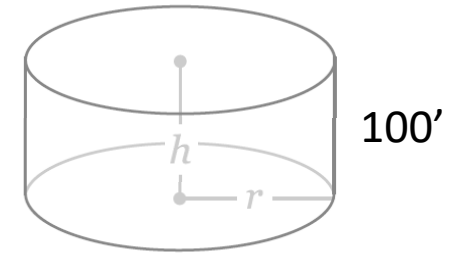
Or, maximum 119,387 acre-feet of water

where: π is Pi, approximately 3.142

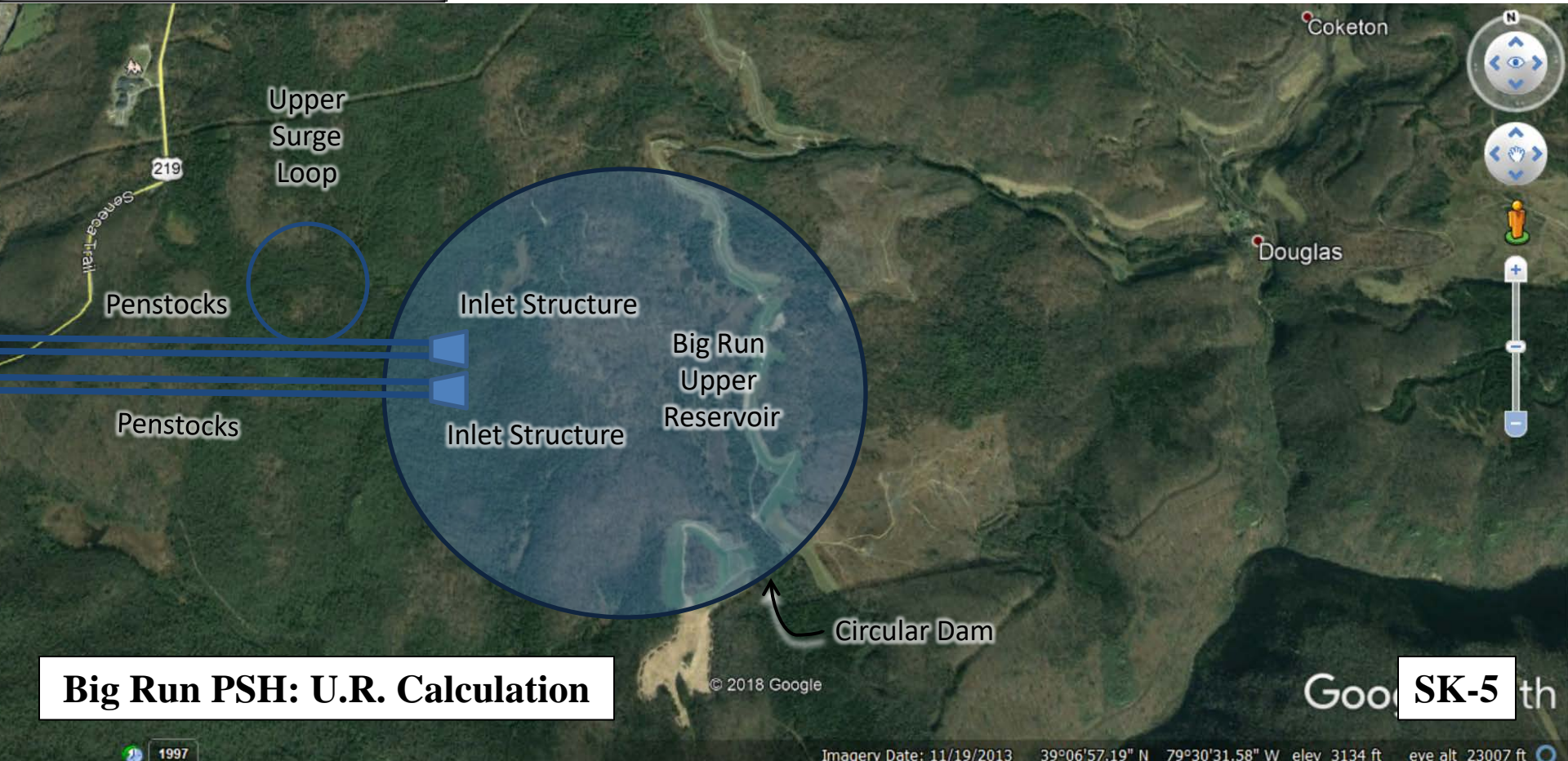
r is 1,250 meters radius

h is 30 meters height of the cylinder

1.55 miles



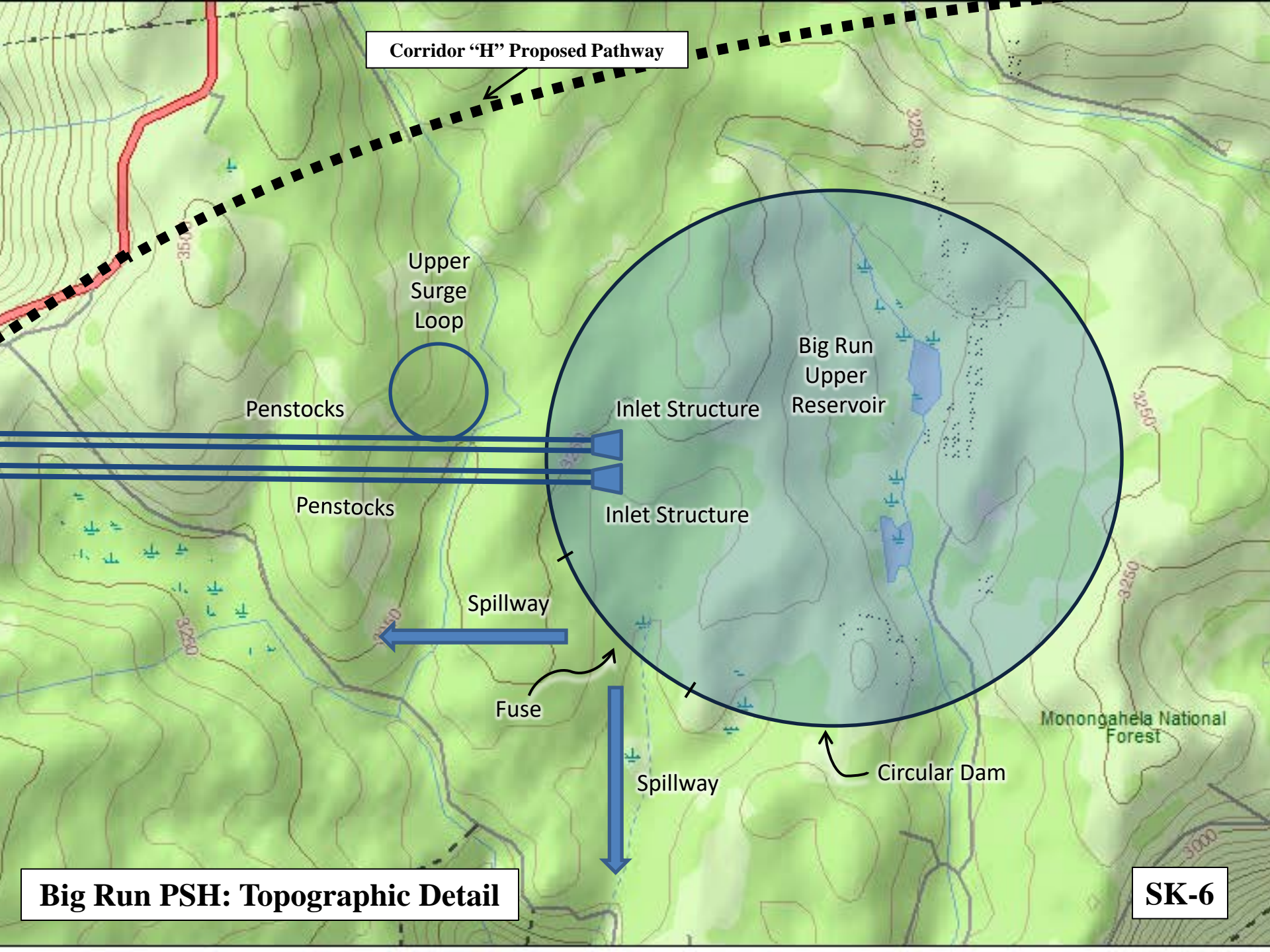
$$V = \pi r^2 h$$



Big Run PSH: U.R. Calculation

SK-5

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Corridor "H" Proposed Pathway

Upper
Surge
Loop

Penstocks

Inlet Structure

Big Run
Upper
Reservoir

Penstocks

Inlet Structure

Spillway

Fuse

Spillway

Circular Dam

Monongahela National
Forest

Big Run PSH: Topographic Detail

SK-6

Western Pocahontas Properties
520 Irwin Rd,
Huntington, WV 25705
(304) 522-5757
Acres: 49 (surveyed)
ID: 01-26600040000

Corridor "H" Proposed Pathway

Western Pocahontas Properties
520 Irwin Rd,
Huntington, WV 25705
(304) 522-5757
Acres: 1809
ID:06-24700010000

Upper
Surge
Loop

Western Pocahontas Properties
520 Irwin Rd,
Huntington, WV 25705
(304) 522-5757
Acres: 1512
ID:06-26700010000

Big Run
Upper
Reservoir

Penstocks

Inlet Structure

Penstocks

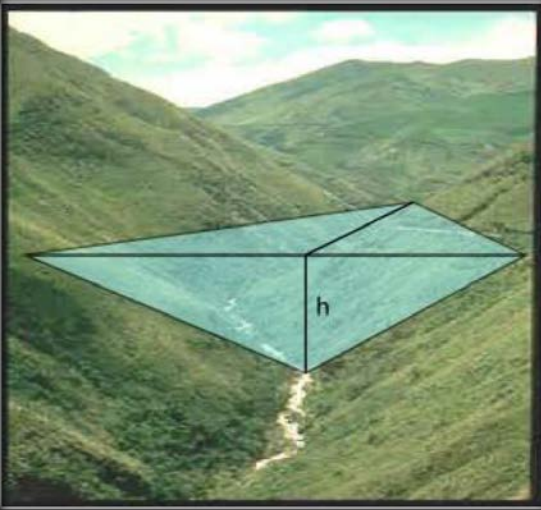
Inlet Structure

**U.S. Forest Service -
Monongahela N.F.**
200 Sycamore St,
Elkins, WV 26241
(304) 636-1800
Acres: 4703
ID: USFS

Western Pocahontas Properties
520 Irwin Rd,
Huntington, WV 25705
(304) 522-5757
Acres: 748
ID:06-26700020000

Circular Dam

Big Run PSH: Land Owner Detail



Mill Run Lower Reservoir: Triangular Prism

Maximum Area = 4,295,522 m²

Or, maximum 1061 acres water at 2,250' msl

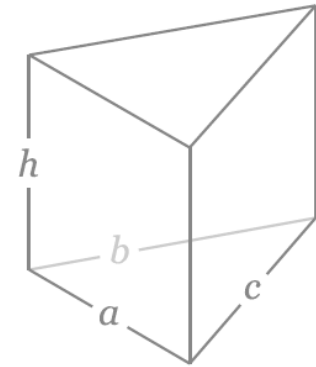
Maximum Volume = 139,875,000 m³

Or, maximum 113,398 acre-feet of water

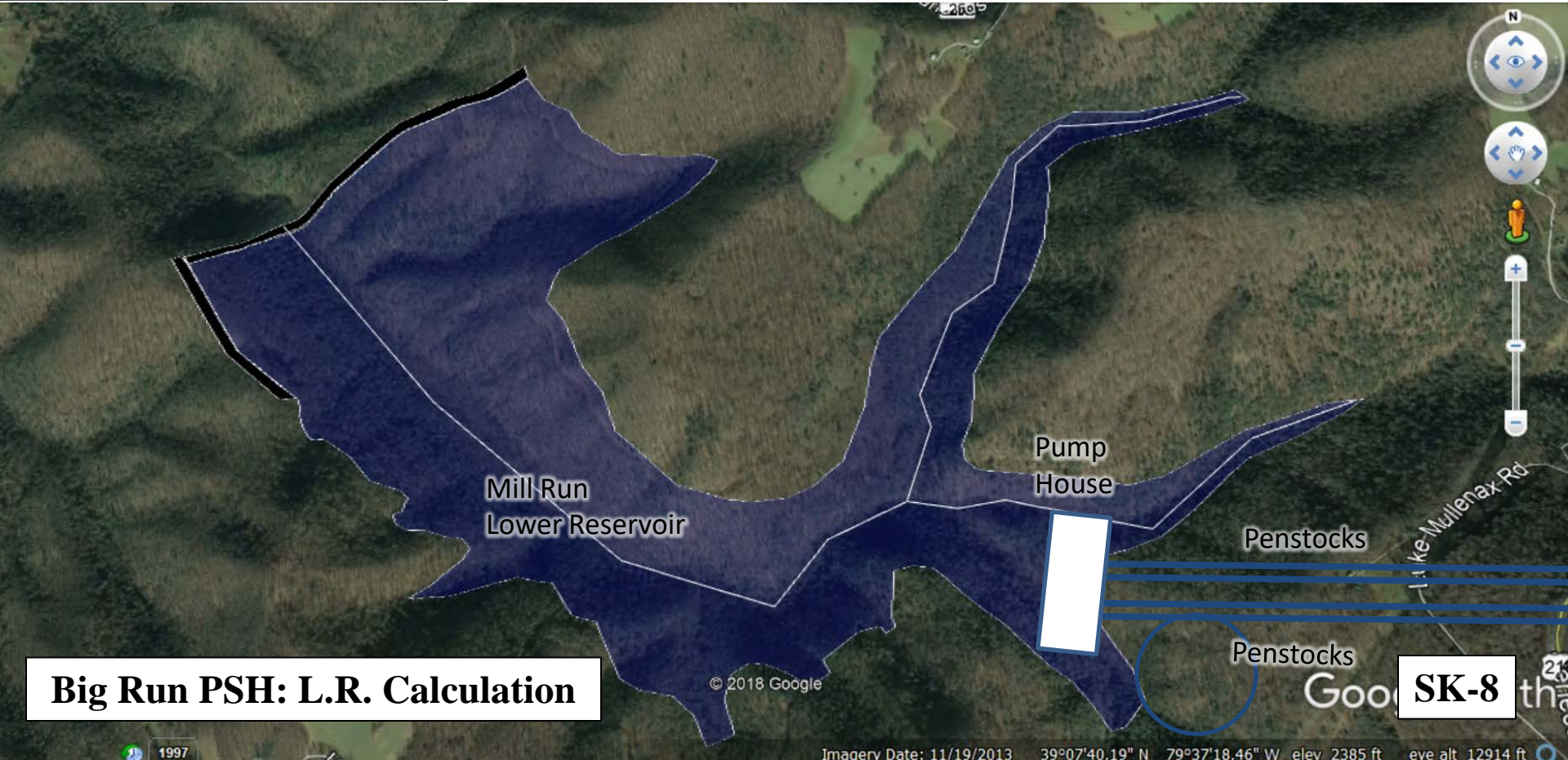
Where: $a = 500$ meters

$b, c = 3.73$ kilometers

$h = 150$ meters



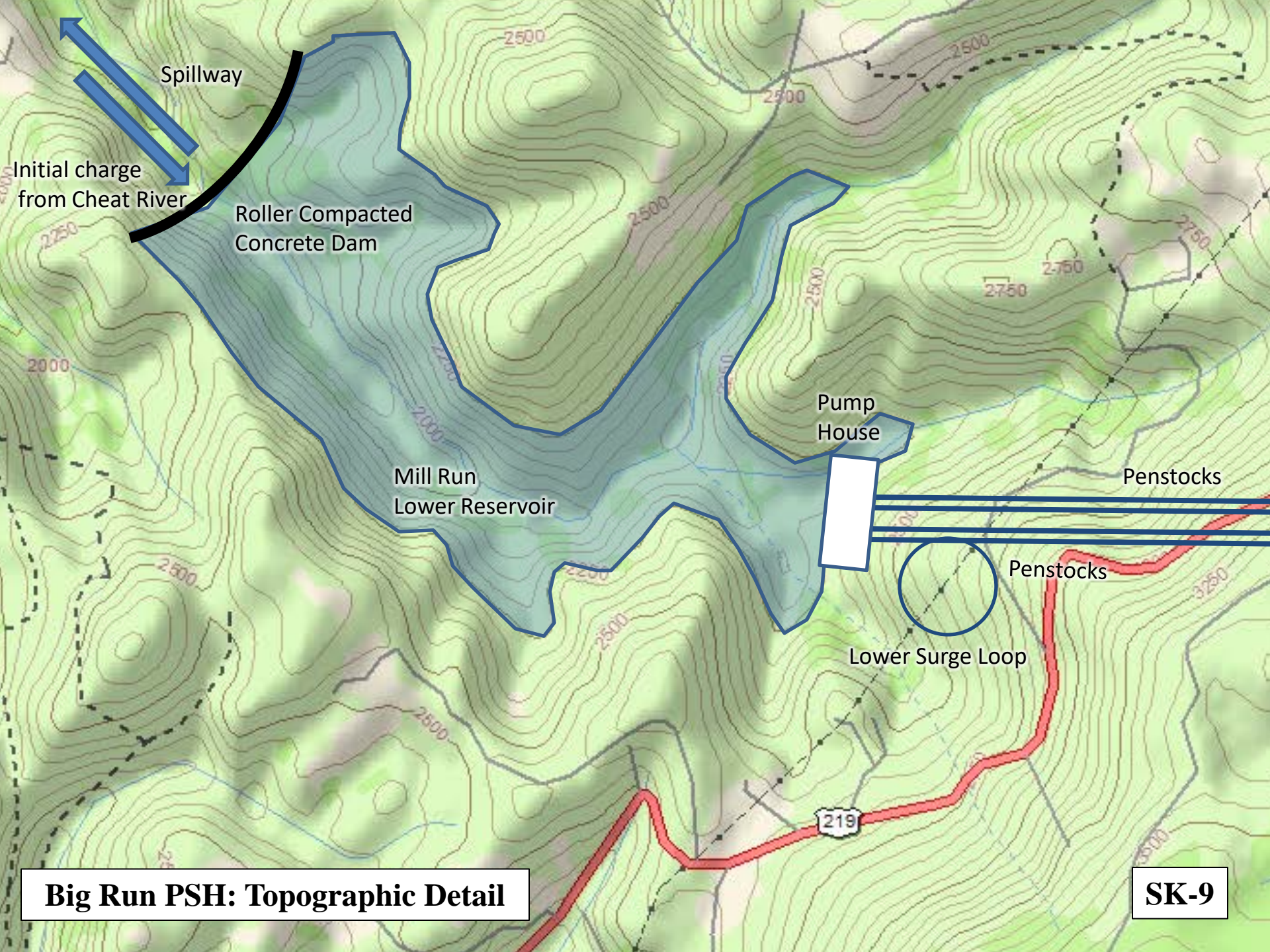
$$V = \frac{1}{4} h \sqrt{-a^4 + 2(ab)^2 + 2(ac)^2 - b^4 + 2(bc)^2 - c^4}$$



Big Run PSH: L.R. Calculation

SK-8

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Spillway

Initial charge
from Cheat River

Roller Compacted
Concrete Dam

Mill Run
Lower Reservoir

Pump
House

Penstocks

Penstocks

Lower Surge Loop

219

Big Run PSH: Topographic Detail

SK-9

Roller Compacted
Concrete Dam

**U.S. Forest Service -
Monongahela N.F.**
200 Sycamore St,
Elkins, WV 26241
(304) 636-1800
Acres: 9526
ID: USFS

Mary A Mullenax,ET AL
1332 Luke Mullenax Road
Hambleton, WV 26269
(304) 478-4832
Acres: 409
ID: 01-26500100000

Reta Jan Harper
431 Luke Mullenax Road
Hambleton, WV 26269
(252) 208-2695
Acres: 2.
ID: 01-26500100001

Pump
House

Mill Run
Lower Reservoir

Headrace

Tailrace

Lower Surge Loop

Herman Esser Revocable Trust
1300 Altimira Court
McLean, VA 25705
(703) 760-9240
Acres: 97
ID: 01-26500090000

31

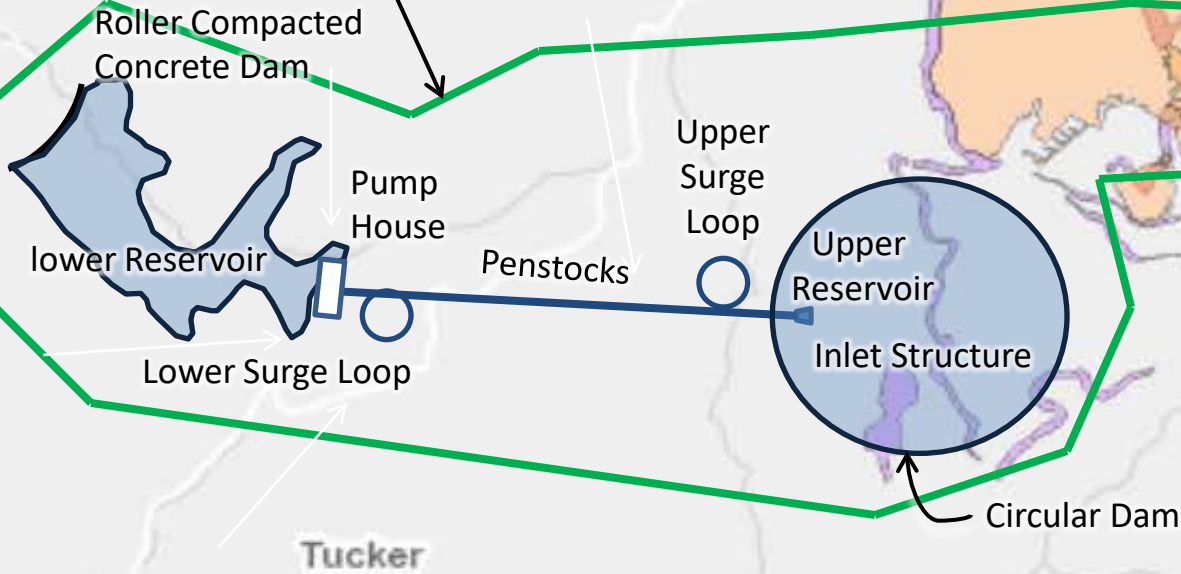
William K & Moody E Collette
319 Silver Fox Road
Hambleton, WV 26269
(304) 000-0000
Acres: 90
ID: 01-26500110000

**U.S. Forest Service -
Monongahela N.F.**
200 Sycamore St,
Elkins, WV 26241
(304) 636-1800
Acres: 4703
ID: USFS

Big Run PSH: Land Owner Detail

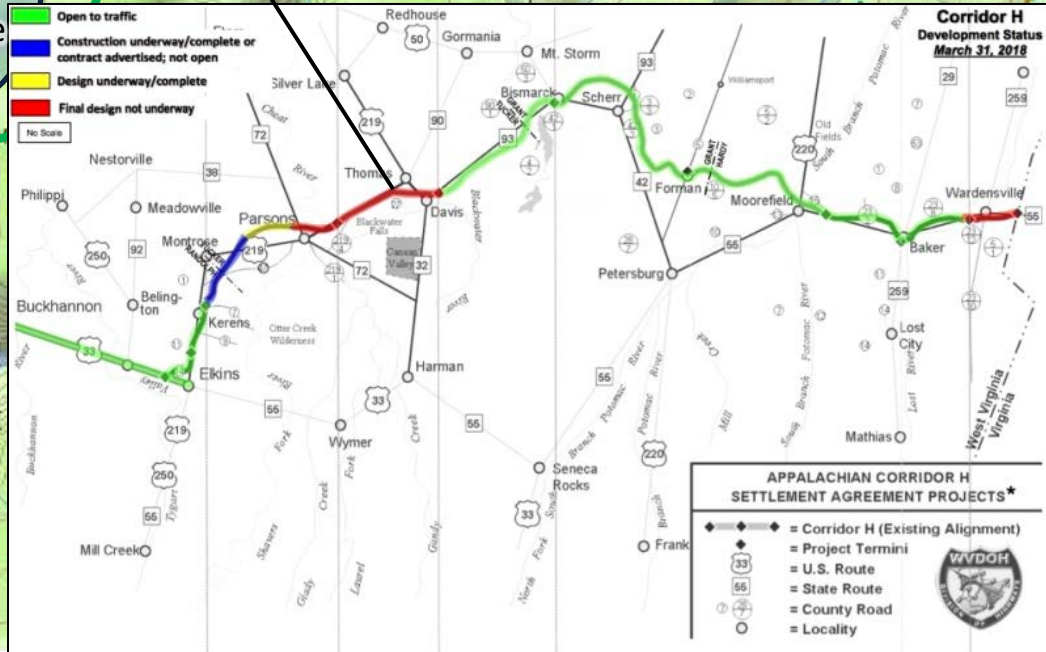
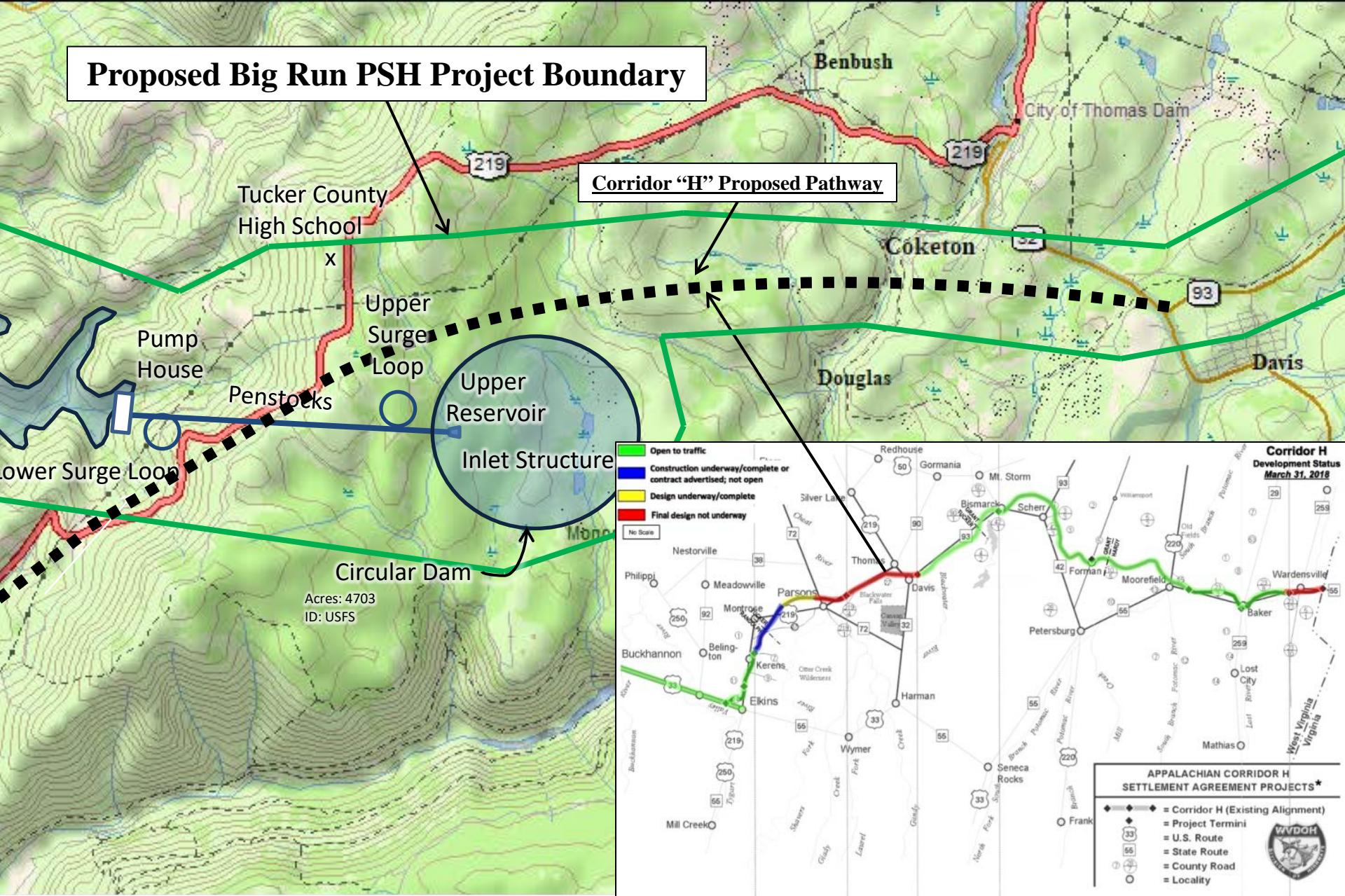
SK-10

Proposed Big Run PSH Project Boundary



Note: Subject to the approval of the authority having jurisdiction, Big Run PSH project plan includes installation of a compacted asphalt concrete liner at upper reservoir to mitigate surface mine minerals from leaching into nearby waterways.

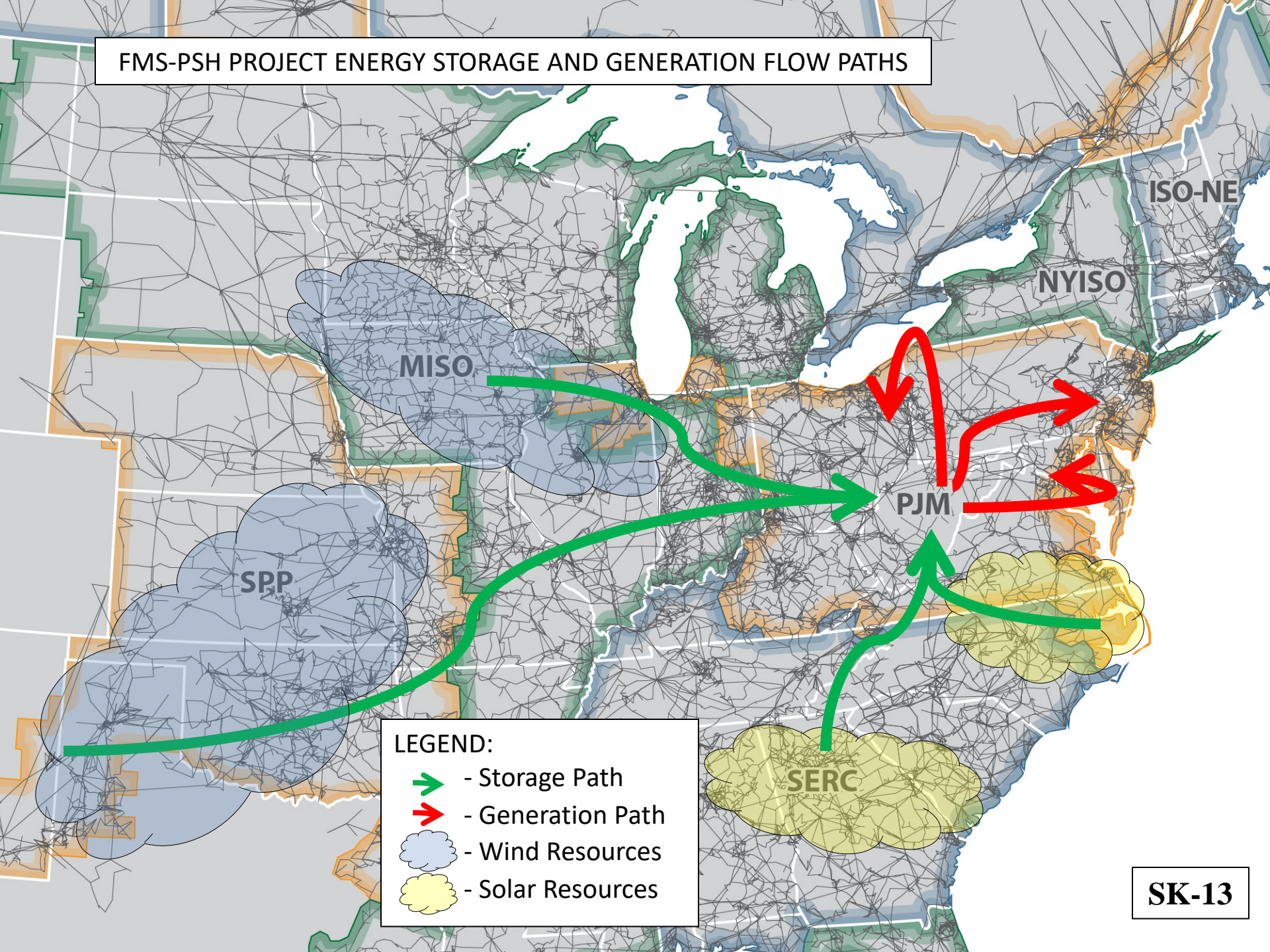
Proposed Big Run PSH Project Boundary







Big Run PSH: Indications of Corridor "H" Proposed Pathway

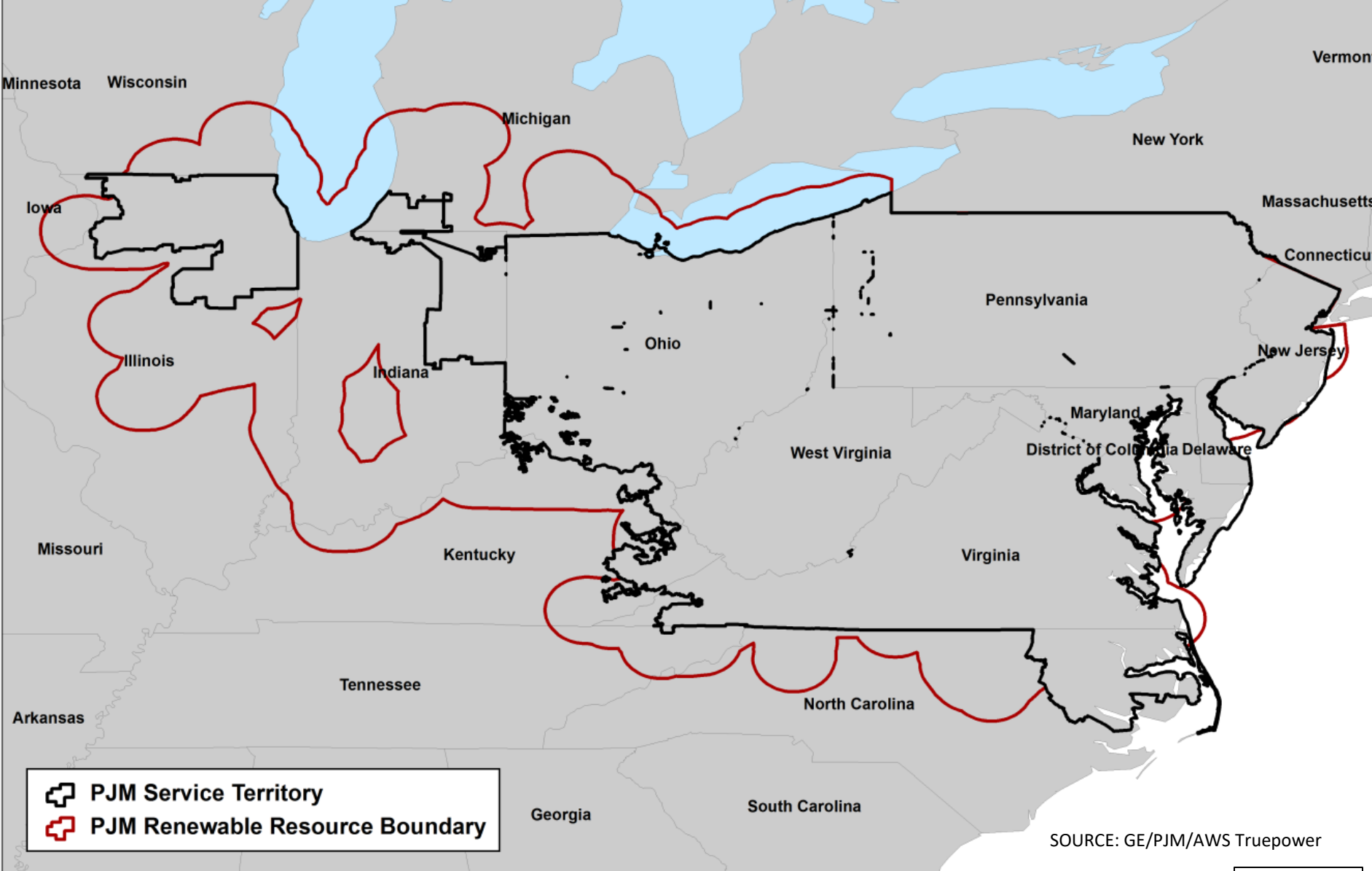
SK-12



FMS-PSH PROJECT ENERGY STORAGE AND GENERATION FLOW PATHS



LEGEND:

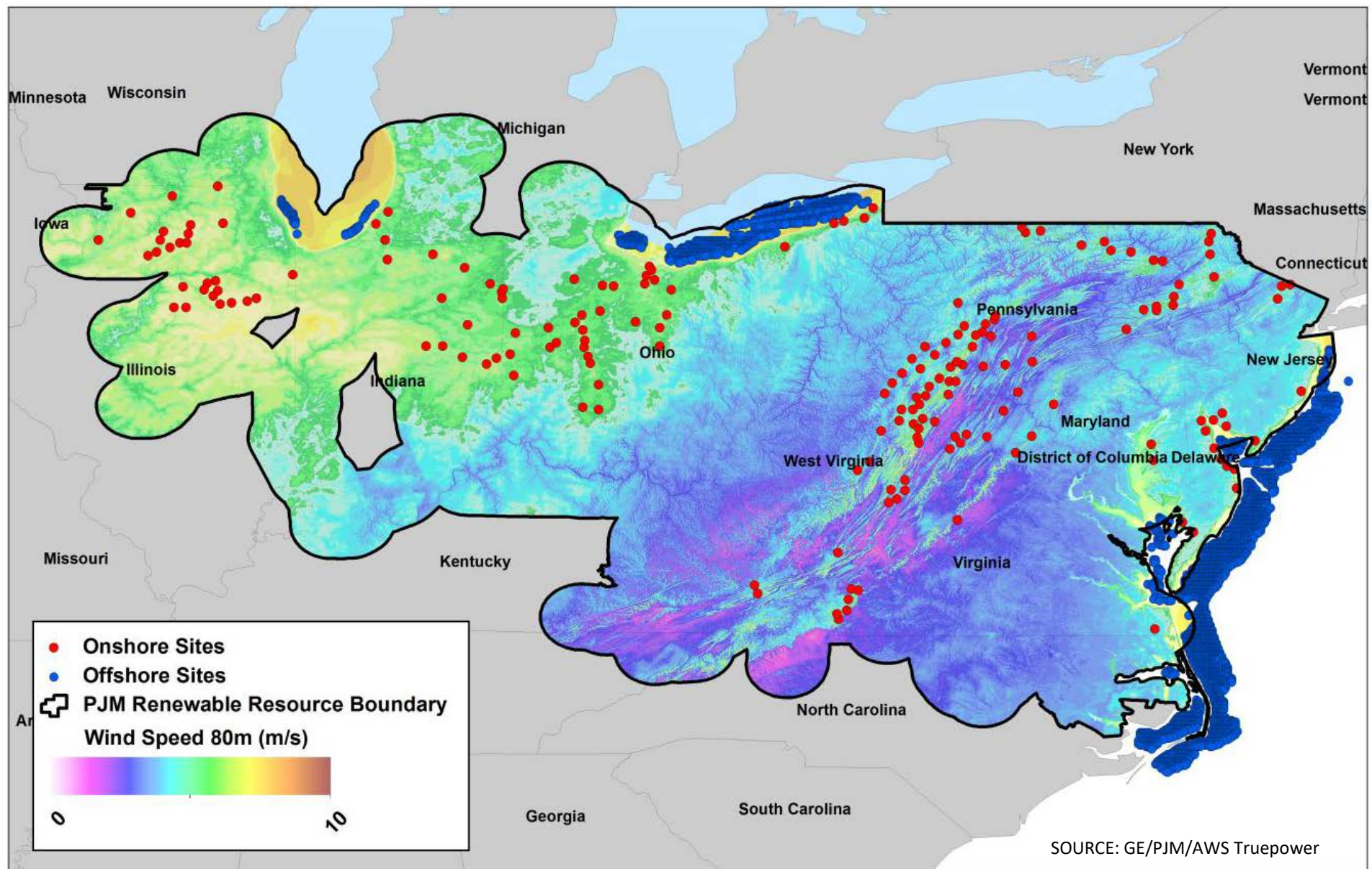
-  - Storage Path
-  - Generation Path
-  - Wind Resources
-  - Solar Resources



 PJM Service Territory
 PJM Renewable Resource Boundary

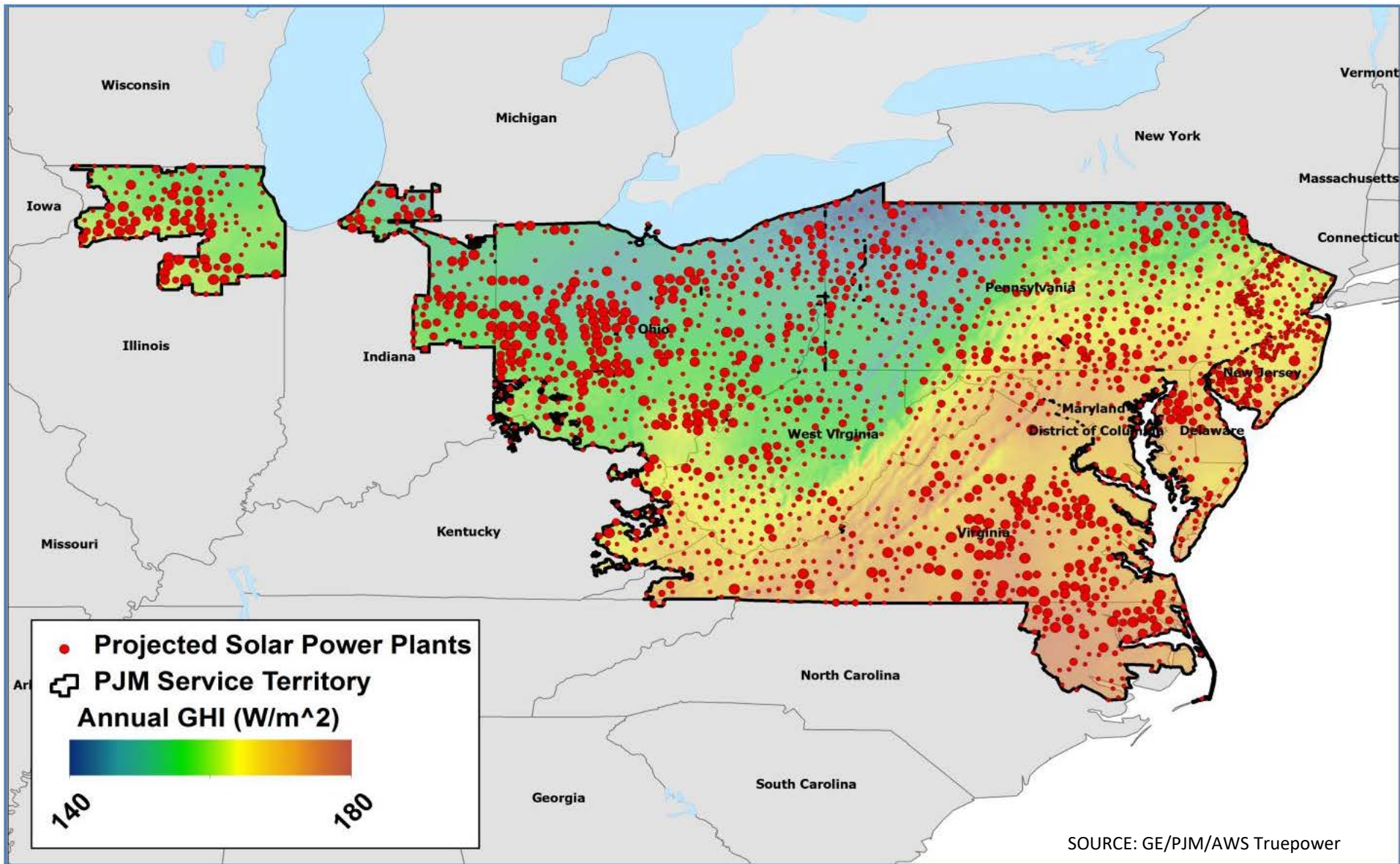
SOURCE: GE/PJM/AWS Truepower

PJM ISO Territory



PJM Wind Project Distribution

SK-15

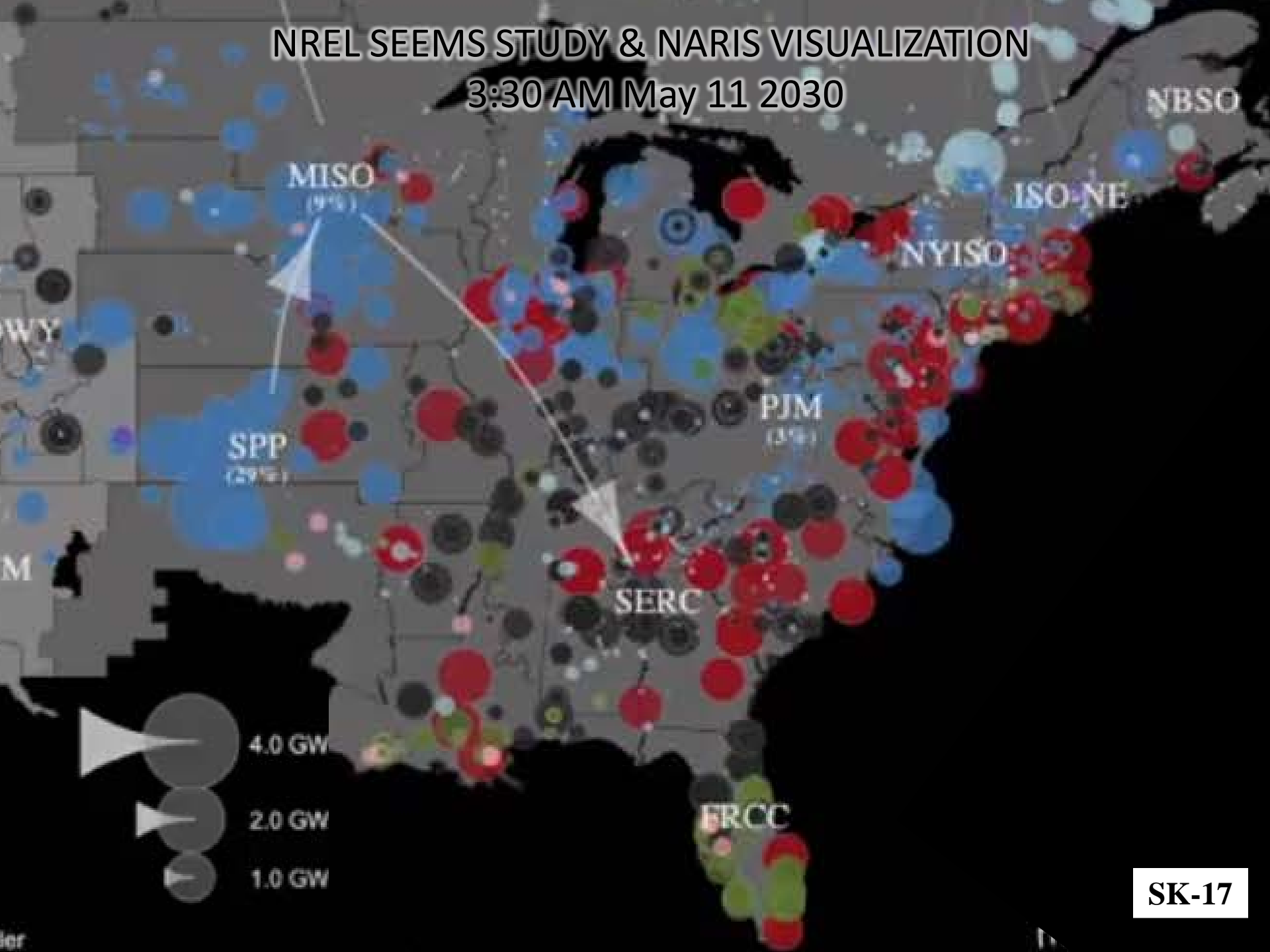


PJM Solar Project Distribution

SK-16

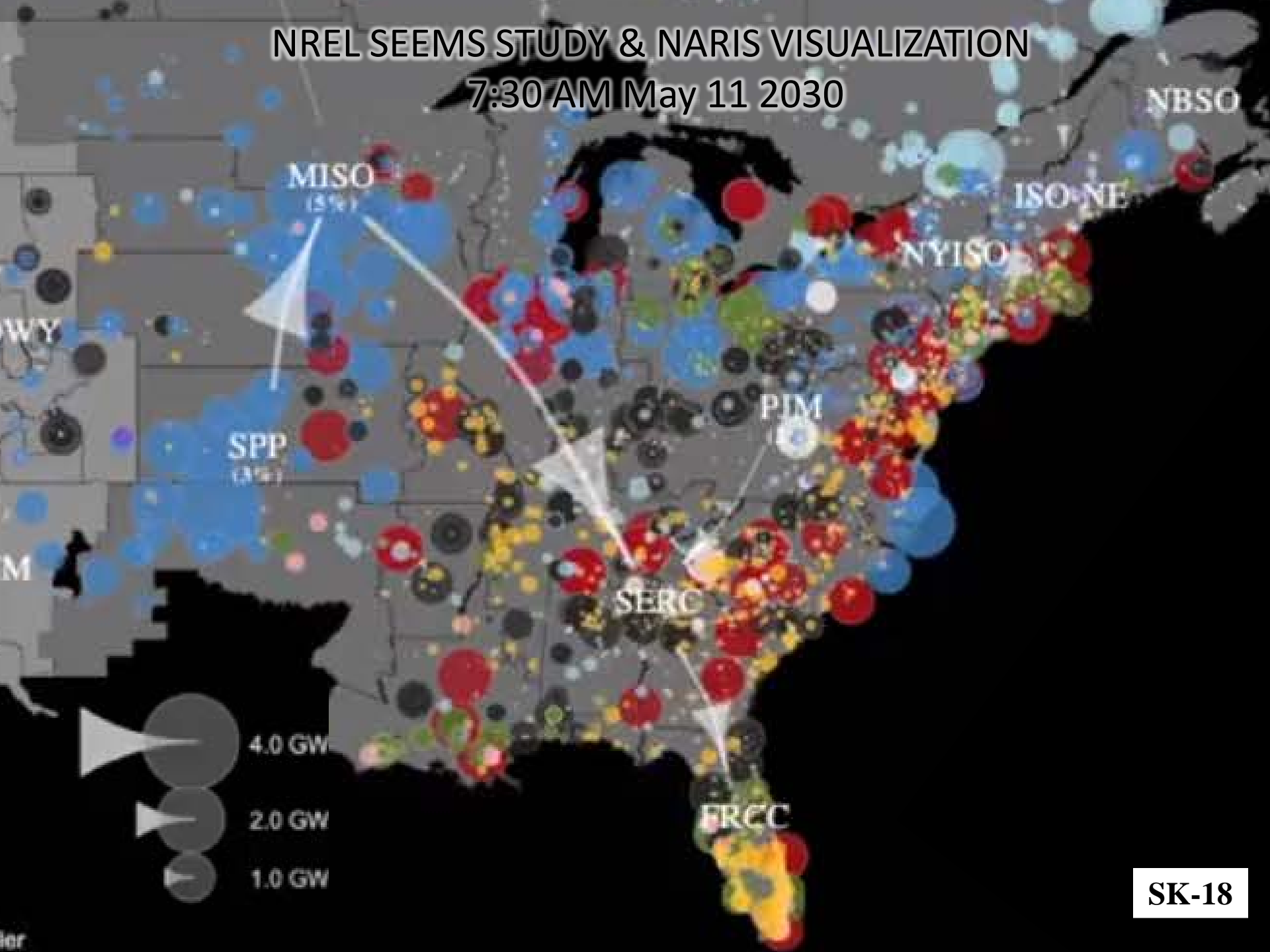
NREL SEEMS STUDY & NARIS VISUALIZATION

3:30 AM May 11 2030



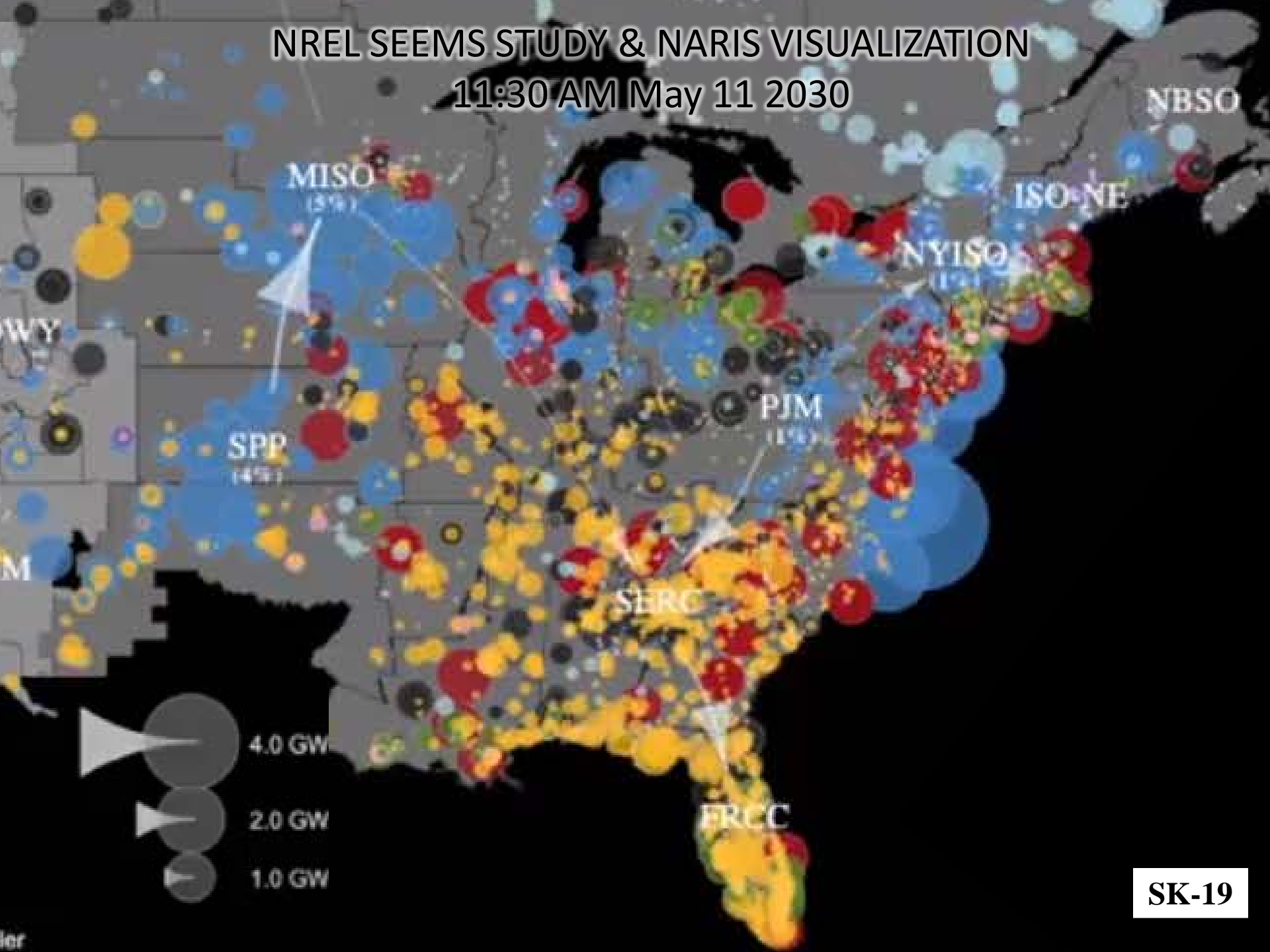
NREL SEEMS STUDY & NARIS VISUALIZATION

7:30 AM May 11 2030



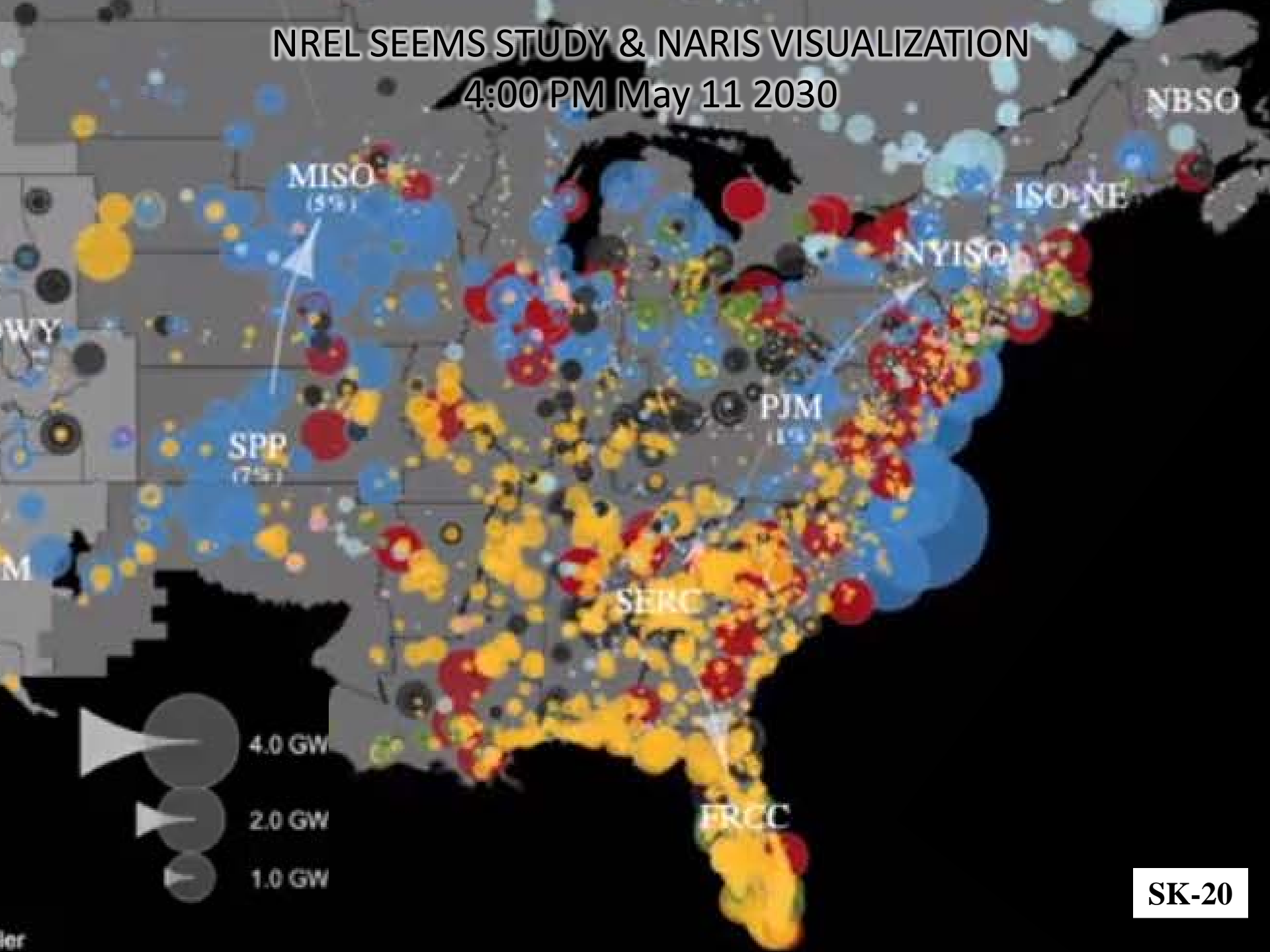
NREL SEEMS STUDY & NARIS VISUALIZATION

11:30 AM May 11 2030



NREL SEEMS STUDY & NARIS VISUALIZATION

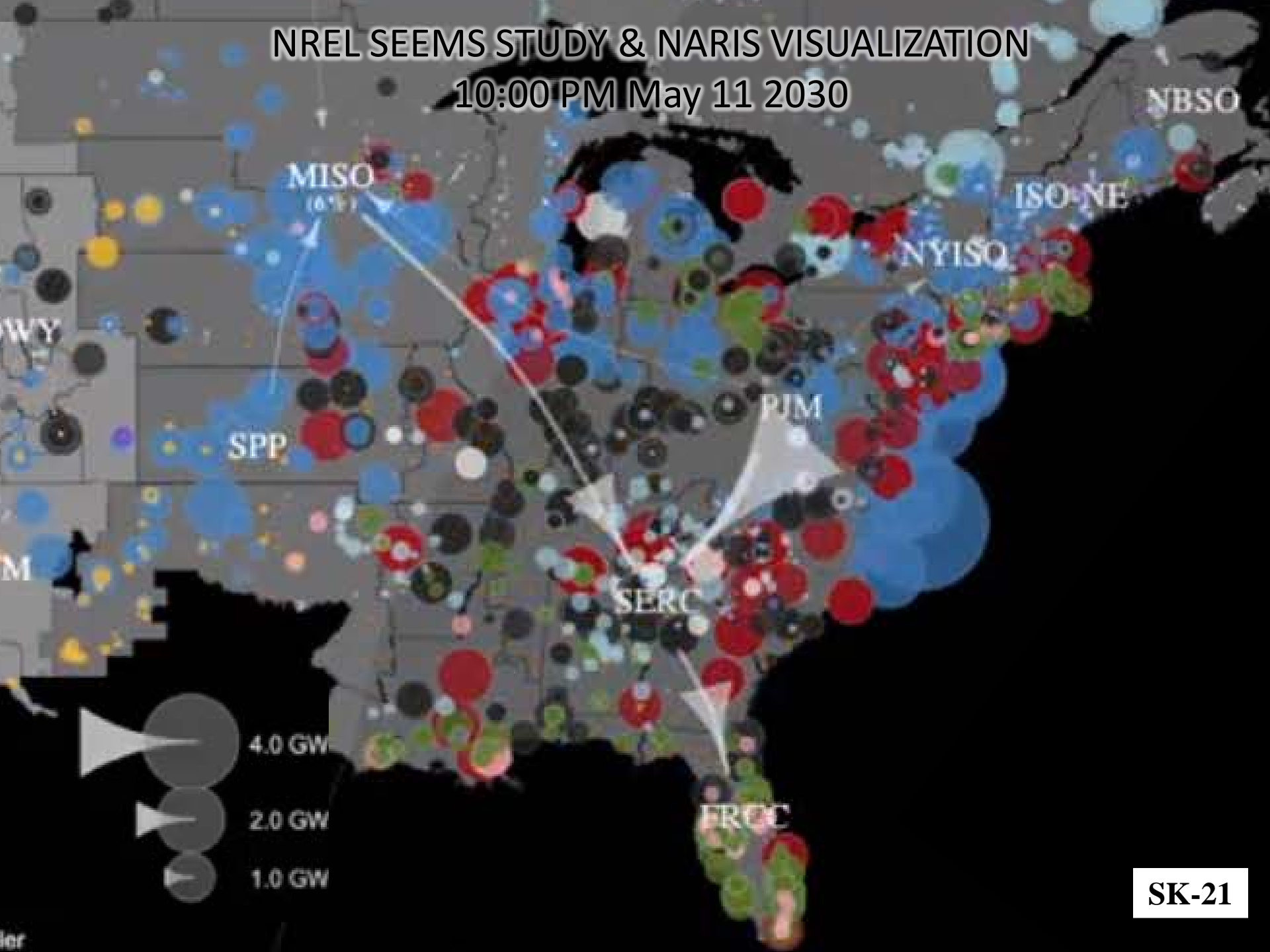
4:00 PM May 11 2030



SK-20

NREL SEEMS STUDY & NARIS VISUALIZATION

10:00 PM May 11 2030





Upper Reservoir

QUESTIONS and ANSWERS?



Lower Reservoir