DOCKETED	
Docket Number:	23-AFC-01
Project Title:	Morton Bay Geothermal Project (MBGP)
TN #:	256320
Document Title:	Wells Considered in Reservoir Simulation of Salton Sea Geothermal Field
Description:	N/A
Filer:	Lindsey Xayachack
Organization:	Jacobs
Submitter Role:	Applicant Consultant
Submission Date:	5/13/2024 1:44:49 PM
Docketed Date:	5/13/2024





Richmond, CA 94804 USA

MEMORANDUM

Date: 9 May 2024

To: Jon Trujillo

GM, Geothermal Development

BHE Renewables, LLC.

Cc: William Thomas

Hossein Shamshiri

From: James Lovekin

Subject: Wells Considered in Reservoir Simulation of Salton Sea Geothermal Field

Dear Jon,

As you have requested, GeothermEx has compiled a list of the wells and data types that we considered in preparing our simulation of the Salton Sea geothermal field, as summarized in our report entitled "Numerical Reservoir Simulation of the Salton Sea Geothermal Resource for Power Generation," dated 4 May 2023. The compiled list is attached as Table 1.

As Table 1 demonstrates, the simulation was comprehensive in scope. It considered data from wells throughout the field, available either on a confidential basis from BHE Renewables' mineral holdings or in the public domain for wells outside BHE Renewables' mineral holdings. The simulation considered the cumulative impact of known projects with a focus on existing wells.

Reference: "Numerical Reservoir Simulation of the Salton Sea Geothermal Resource for Power Generation" dated 4 May 2023

Data types considered in simulation:

Production wells: Flow Rate, Enthalpy, TDS and NCG; Pressure/Temperature Surveys

Injection wells: Injection Rate, TDS and injection temperature; Pressure/Temperature Surveys

Observation wells: Resevoir pressure monitoring; Pressure/Temperature Surveys

Idle and Abandoned wells: Data based on historical well type (production, injection, observation, or combinations thereof)

Exploration and Development wells: Variable data sets, typically including Pressure/Temperature surveys; flow and/or injection tests at completion, if available

CTR Hell's Kitchen Wells: Assumptions were made regarding performance and approximate locations of hypothetical wells, compatible with the

Well Name	API	Status as of	Well Type	Historical	Latitude	Longitude	Section	Town-	Range
	Number	May 2023	as of May 2023	Well Type				ship	
Del Ranch 1	02590669	Abandoned	-	Production	33.166286	-115.615000	33	115	13E
Del Ranch 2	02590670	Abandoned	-	Production	33.166189	-115.614764	33	115	13E
Del Ranch 3	02590671	Abandoned	-	Production	33.161782	-115.614114	4	125	13E
Del Ranch 4	02590672	Abandoned	-	Production	33.159740	-115.614086	4	125	13E
Del Ranch 5	02590673	Abandoned	-	Production	33.157793	-115.614131	4	125	13E
Del Ranch 6	02590674	Active	Observation	Production	33.157314	-115.614170	4	125	13E
Del Ranch 7	02590675	Abandoned	-	Production	33.166461	-115.614709	33	115	13E
Del Ranch 8	02590676	Abandoned	-	Production	33.155049	-115.614217	4	125	13E
Del Ranch 9	02591204	Abandoned	-	Production	33.155623	-115.614141	4	125	13E
Del Ranch 10	02591258	Active	Production	-	33.162300	-115.620307	33	115	13E
Del Ranch 11	02591261	Active	Production	-	33.163608	-115.621560	33	115	13E
Del Ranch 12	02591264	Active	Production	-	33.163231	-115.624661	33	115	13E
Del Ranch 14	02591451	Active	Production	-	33.163619	-115.620818	33	115	13E
Del Ranch 15	02591522	Active	Production	-	33.168795	-115.621964	33	115	13E
Del Ranch IW 1	02590677	Idle	-	Injection	33.172469	-115.605335	34	115	13E
Del Ranch IW 2	02590678	Active	Injection	-	33.172297	-115.605245	34	115	13E
Del Ranch IW 3	02590679	Active	Injection	-	33.172075	-115.605271	34	115	13E
Del Ranch IW 4	02590727	Abandoned	-	Injection	33.165431	-115.617397	33	115	13E
Del Ranch IW 8	02591485	Active	Injection	-	33.170028	-115.606110	34	115	13E
Del Ranch IW 9	02591514	Active	Injection	-	33.168707	-115.606557	34	115	13E
Elmore 1	02590027	Abandoned	Production	-	33.183059	-115.612176	27	115	13E
Elmore 2	02590352	Active	Observation	-	33.177194	-115.596149	26	115	13E
Elmore 3	02590036	Abandoned	Production	-	33.177503	-115.612775	27	115	13E
Elmore 4	02590658	Abandoned	Production	-	33.180857	-115.586919	26	115	13E



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Well Name	API	Status as of	Well Type	Historical	Latitude	Longitude	Section	Town-	Range
	Number	May 2023	as of May 2023	Well Type				ship	
Elmore 6	02590702	Abandoned	Production	1	33.180610	-115.586945	26	115	13E
Elmore 10	02590703	Abandoned	=	Observation	33.183690	-115.610041	27	115	13E
Elmore 11	02590704	Active	Observation	-	33.183716	-115.609895	27	115	13E
Elmore 12	02590705	Active	Production	1	33.183652	-115.604608	27	115	13E
Elmore 13	02590706	Abandoned	-	Producer	33.183628	-115.604402	27	115	13E
Elmore 14	02590681	Active	Production	1	33.183440	-115.595530	27	115	13E
Elmore 15	02591205	Active	Production	1	33.183468	-115.595090	26	115	13E
Elmore 16	02591254	Active	Production	-	33.183635	-115.595702	26	115	13E
Elmore 100	02591171	Abandoned	-	Production	33.155100	-115.643178	5	12S	13E
Elmore 101	02591253	Active	Injection	-	33.147676	-115.647443	5	125	13E
Elmore IW 3	02590708	Idle	-	Injection	33.170551	-115.596998	35	115	13E
Elmore IW 4	02590709	Active	Injection	-	33.175732	-115.597010	34	115	13E
Elmore IW 5	02590710	Active	Injection	-	33.172919	-115.597001	34	115	13E
Elmore IW 6	02590711	Active	Injection	-	33.177092	-115.600259	27	115	13E
GeoGenCo 501	02591501	Idle	-	Development	33.202389	-115.558556	19	115	14E
GeoGenCo 502	02591502	Idle	-	Development	33.202111	-115.558556	19	115	14E
Hudson 1	02590028	Abandoned	=	Exploration	33.212220	-115.569817	13	115	13E
Hudson Ranch 13-1	02591444	Active	Production	-	33.506480	-115.577130	13	115	13E
Hudson Ranch 13-2	02591492	Active	Production	-	33.206400	-115.570700	13	115	13E
Hudson Ranch 13-3	02591448	Active	Production	-	33.206500	-115.576583	13	115	13E
Hudson Ranch IW-01	02591493	Active	Injection	-	33.211800	-115.563100	13	115	13E
Hudson Ranch IW-02	02591494	Active	Injection	-	33.211806	-115.563361	13	115	13E
Hudson Ranch IW-03	02591495	Active	Injection	-	33.211800	-115.563700	13	115	13E
Hudson Ranch IW-04	02591496	Active	Injection	-	33.206500	-115.576900	13	115	13E



Reference: "Numerical Reservoir Simulation of the Salton Sea Geothermal Resource for Power Generation" dated 4 May 2023

Data types considered in simulation:

Production wells: Flow Rate, Enthalpy, TDS and NCG; Pressure/Temperature Surveys

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Observation wells: Resevoir pressure monitoring; Pressure/Temperature Surveys

Idle and Abandoned wells: Data based on historical well type (production, injection, observation, or combinations thereof)

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CTR Hell's Kitchen Wells: Assumptions were made regarding performance and approximate locations of hypothetical wells, compatible with the

Well Name	API	Status as of	Well Type	Historical	Latitude	Longitude	Section	Town-	Range
	Number	May 2023	as of May 2023	Well Type				ship	
IID-1	02590019	Abandoned	-	Development	33.202083	-115.592761	23	115	13E
IID-2	02590020	Abandoned	-	Development	33.196588	-115.599117	22	115	13E
IID-3	02590021	Abandoned	-	Development	33.205317	-115.588665	23	115	13E
IID-4	02591170	Active	Injection	-	33.160124	-115.646651	5	125	13E
IID-5	02590193	Active	Injection	-	33.155242	-115.646673	5	125	13E
IID-6	02590194	Active	Injection	-	33.160731	-115.646575	5	125	13E
IID-7	02590880	Active	Observation	-	33.155783	-115.646374	5	125	13E
IID-8	02591189	Active	Observation	-	33.173273	-115.638649	32	115	13E
IID-9	02590506	Active	Observation	Production, then Injection	33.155159	-115.644171	5	12S	13E
IID-10	02590726	Active	Observation	-	33.155727	-115.645383	5	125	13E
IID-11	02590451	Idle	-	Injection	33.161177	-115.646647	5	125	13E
IID-12	02590452	Abandoned	Production	-	33.155130	-115.643583	5	12S	13E
IID-14	02591188	Abandoned	-	Observation	33.197510	-115.612699	22	115	13E
IID-16	02591240	Active	Production	-	33.160796	-115.639693	5	125	13E
IID-17	02591256	Active	Injection	-	33.148667	-115.646997	5	12S	13E
Imperial 1-13	02590695	Abandoned	-	Exploration	33.213649	-115.577590	13	115	13E
Magmamax 1 (M 1)	02590010	Abandoned	-	Production	33.162664	-115.618005	33	115	13E
Magmamax 2 (M 2)	02590011	Abandoned	-	Production	33.168874	-115.630366	33	115	13E
Magmamax 3 (M 3)	02590012	Abandoned	-	Production	33.168924	-115.622790	33	115	13E
Magmamax 4 (M 4)	02590013	Abandoned	-	Production	33.169020	-115.623173	33	115	13E
Magmamax 5 (M 5)	02590606	Abandoned	-	Production	33.162679	-115.623144	33	115	13E
Magmamax 6B (M 6B)	02591193	Active	Production		33.162459	-115.622906	33	115	13E
Magmamax 7 (M 7)	02590607	Abandoned	-	Production	33.163149	-115.623004	33	115	13E
Magmamax 8 (M 8)	02590450	Active	Observation	-	33.162926	-115.630578	33	115	13E



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Data types considered in simulation:

Production wells: Flow Rate, Enthalpy, TDS and NCG; Pressure/Temperature Surveys

Injection wells: Injection Rate, TDS and injection temperature; Pressure/Temperature Surveys

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Well Name	API	Status as of	Well Type	Historical	Latitude	Longitude	Section	Town-	Range
	Number	May 2023	as of May 2023	Well Type				ship	
Magmamax 9 (M 9)	02590618	Abandoned	=	Production	33.163445	-115.623008	33	115	13E
Magmamax 10 (M 10)	02590619	Active	Production	-	33.163239	-115.620538	33	115	13E
Magmamax 11 (M 11)	02590620	Abandoned	-	Production	33.163750	-115.621603	33	115	13E
Magmamax 12 (M 12)	02590608	Abandoned	-	Production	33.163441	-115.619924	33	115	13E
Magmamax 13 (M 13)	02590621	Abandoned	-	Production	33.162598	-115.620471	33	115	13E
Magmamax 14 (M 14)	02590609	Abandoned	-	Production	33.162653	-115.619708	33	115	13E
Magmamax 15 (M 15)	02590622	Abandoned	-	Production	33.162651	-115.620002	33	115	13E
Magmamax 16 (M 16)	02590604	Active	Injection	1	33.163330	-115.614314	33	115	13E
Magmamax 17 (M 17)	02591268	Active	Observation	-	33.162950	-115.614605	33	115	13E
Magmamax 18 (M 18)	02591510	Active	Injection	-	33.155989	-115.614749	4	125	13E
Magmamax 19 (M 19)	02591516	Active	Injection	-	33.161086	-115.641418	34	11 S	13E
PDC-1	02590024	Abandoned	•	Exploration	33.225787	-115.609267	10	115	13E
PDC-3	02590026	Abandoned	-	Exploration	33.224807	-115.608835	10	115	13E
P2-14	02590754	Abandoned	-	Exploration	33.225536	-115.577752	12	115	13E
P2-15	02590755	Abandoned	1	Exploration	33.221912	-115.573415	13	115	13E
River Ranch 1	02590029	Abandoned	-	Production	33.202778	-115.577969	24	115	13E
River Ranch 2	02591269	Idle	-	Injection	33.183183	-115.562766	25	115	13E
River Ranch 3	02590665	Active	Injection	Production	33.183291	-115.562167	25	115	13E
River Ranch 4	02590885	Idle	-	Injection	33.177155	-115.564667	25	115	13E
River Ranch 5	02590886	Active	Injection	-	33.177134	-115.564138	25	115	13E
River Ranch 6	02590889	Active	Injection	-	33.179565	-115.562174	25	115	13E
River Ranch 7	02590854	Active	Observation	Production	33.183259	-115.578113	25	115	13E
River Ranch 8	02590863	Active	Production	-	33.183115	-115.577652	25	11 S	13E
River Ranch 9	02591097	Active	Production	-	33.183417	-115.576705	25	115	13E



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Well Name	API	Status as of	Well Type	Historical	Latitude	Longitude	Section	Town-	Range
	Number	May 2023	as of May 2023	Well Type				ship	
River Ranch 11	02590890	Active	Production	-	33.183350	-115.575530	25	115	13E
River Ranch 12	02590876	Active	Production	-	33.183036	-115.574586	25	115	13E
River Ranch 13	02591191	Active	Injection	-	33.179882	-115.562678	25	115	13E
River Ranch 14	02591194	Active	Production	-	33.183012	-115.578139	25	11 S	13E
River Ranch 16	02591096	Idle	-	Injection	33.177073	-115.562140	25	115	13E
River Ranch 17	02591104	Active	Observation	Production	33.183259	-115.570771	25	115	13E
River Ranch 18	02591257	Active	Production	-	33.183552	-115.578646	25	115	13E
River Ranch 19	02591515	Active	Injection	-	33.178990	-115.564250	25	115	13E
River Ranch 20	02591523	Active	Injection	-	33.182391	-115.564280	25	115	13E
Sinclair 1	02590015	Abandoned	-	Exploration	33.147069	-115.613952	10	12S	13E
Sinclair 2	02590016	Abandoned	-	Development	33.148003	-115.622213	4	12S	13E
Sinclair 3	02590017	Abandoned	-	Development	33.146465	-115.613477	10	12S	13E
Sinclair 4	02590018	Abandoned	-	Development	33.148577	-115.622247	4	12S	13E
Sinclair 10	02590871	Active	Production	-	33.155252	-115.638099	5	125	13E
Sinclair 11	02591251	Active	Production	-	33.154150	-115.635123	5	125	13E
Sinclair 13	02590234	Abandoned	-	Production, then Observation	33.154191	-115.639649	5	12S	13E
Sinclair 15	02590196	Active	Injection	-	33.147998	-115.646816	5	125	13E
Sinclair 20	02590454	Active	Injection	-	33.155101	-115.642920	5	125	13E
Sinclair 21	02590846	Active	Injection	-	33.147842	-115.638482	5	12S	13E
Sinclair 22	02590848	Active	Injection	-	33.147864	-115.638108	5	12S	13E
Sinclair 23	02590859	Active	Injection	-	33.147852	-115.637807	5	12S	13E
Sinclair 24	02591236	Active	Injection	-	33.147818	-115.637498	5	125	13E
Sinclair 25	02590455	Abandoned	-	Injection	33.148252	-115.647035	5	125	13E
Sinclair 26	02591247	Active	Injection	-	33.148070	-115.631949	5	125	13E



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Well Name	API	Status as of	Well Type	Historical	Latitude	Longitude	Section	Town-	Range
	Number	May 2023	as of May 2023	Well Type				ship	
Sinclair 27	02591248	Active	Injection	-	33.148072	-115.631581	5	12S	13E
Sinclair 30	02591178	Abandoned	-	Observation	33.154288	-115.622516	4	4	125
Smith IW 1	02591259	Active	Injection	-	33.166332	-115.596911	34	115	13E
Smith IW 2	02591263	Active	Injection	1	33.166578	-115.596973	34	115	13E
Sportsman 1	02590023	Abandoned	-	Exploration	33.200561	-115.587836	23	115	13E
State 2-14	02590632	Abandoned	-	Exploration	33.208107	-115.579863	14	115	13E
State of CA 1	02590022	Abandoned	-	Development	33.191621	-115.589094	23	115	13E
Vonderahe 1	02590633	Active	Production	-	33.155377	-115.638650	5	125	13E
Vonderahe 2	02591252	Active	Production	-	33.154312	-115.634497	5	12S	13E
Vonderahe 3	02591239	Active	Production	-	33.161405	-115.639249	5	125	13E
Vonderahe 4	02591267	Active	Production	-	33.154345	-115.631504	5	12 S	13E
Vonderahe 5	02591513	Active	Production	-	33.161083	-115.641291	5	125	13E
Vonderahe 6	02591518	Active	Production	-	33.158333	-115.637222	5	125	13E
VR 1	02591262	Active	Observation	-	33.163454	-115.624022	33	115	13E
Vulcan IW 1	02590623	Idle	1	Injection	33.172689	-115.605691	34	115	13E
Vulcan IW 2	02590624	Abandoned	-	Injection	33.173011	-115.605578	34	115	13E
Vulcan IW 3	02590625	Abandoned	-	Injection	33.174220	-115.605594	34	115	13E
Vulcan IW 4	02590626	Idle	-	Injection	33.176246	-115.608852	34	115	13E
Vulcan IW 5	02590203	Abandoned	-	Injection	33.163489	-115.616372	33	115	13E
Vulcan IW 6	02590627	Abandoned	=	Injection	33.176121	-115.609144	34	115	13E
Vulcan IW 7	02590628	Abandoned	=	Injection	33.176242	-115.609469	34	115	13E
Vulcan IW 8	02591227	Active	Injection	-	33.175893	-115.606084	34	115	13E
Wilson 1-12	02590685	Abandoned	-	Exploration	33.226819	-115.578534	12	115	13E
Woolsey 1	02590014	Abandoned	-	Exploration	33.163059	-115.614281	33	115	13E

