

Huffman-Broadway Group, Inc.

Environmental Regulatory Consultants

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April 23, 2013

Jason Gipson, Project Manager
U.S. Army Corps of Engineers, Sacramento District
Bountiful Office
533 West 2600 South, Suite 150
Bountiful, Utah 84010

Subject: Amended Permit Application for the Proposed GSLM Pond Expansion Project, Great Salt Lake, Utah; Corps File No. SPK-2007-00121-UO.

Dear Mr. Gipson:

On behalf of the Applicant, Great Salt Lake Minerals Corporation (GSLM), Huffman-Broadway Group (HBG) is submitting the enclosed amended permit application for the GSLM Pond Expansion Project. The Applicant is proposing significant changes to the project described in the Corps' June 2009 Public Notice. The amended permit application presents a project plan that responds to comments received during the Corps' 2009 EIS scoping and public comment period, meetings with agency staff and stakeholders. The project plan (a) significantly reduced the size of the projected expansion, its consumptive water use, and its potential for adverse environmental impacts, and (b) formalizes a phased "adaptive management" approach to project development as requested by the agencies.

If you need additional information or have any questions regarding this application please call or email me at 415.385.1045 / thuffman@h-bgroup.com.

Sincerely,



Terry Huffman, PhD
Wetlands Regulatory Scientist

CC: Joseph Havasi, Natural Resource Manager, Compass Minerals

Enclosure: April 2013 Amended Individual Permit Application

**U.S. ARMY CORPS OF ENGINEERS
APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT**
33 CFR 325. The proponent agency is CECW-CO-R.

OMB APPROVAL NO. 0710-0003
EXPIRES: 28 FEBRUARY 2013

Public reporting for this collection of information is estimated to average 11 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of the collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters, Executive Services and Communications Directorate, Information Management Division and to the Office of Management and Budget, Paperwork Reduction Project (0710-0003). Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. Please DO NOT RETURN your form to either of those addresses. Completed applications must be submitted to the District Engineer having jurisdiction over the location of the proposed activity.

PRIVACY ACT STATEMENT

Authorities: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Programs of the Corps of Engineers; Final Rule 33 CFR 320-332. Principal Purpose: Information provided on this form will be used in evaluating the application for a permit. Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public and may be made available as part of a public notice as required by Federal law. Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated nor can a permit be issued. One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and/or instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.

(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETE
--------------------	----------------------	------------------	------------------------------

(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME First - Joseph Middle - Raymond Last - Havasi Company - Compass Minerals E-mail Address - havasij@compassminerals.com	8. AUTHORIZED AGENT'S NAME AND TITLE (agent is not required) First - Robert Middle - Terry Last - Huffman Company - Huffman-Broadway Group, Inc E-mail Address - thuffman@h-bgroup.com
6. APPLICANT'S ADDRESS: Address- 9900 West 109th Street, Suite 600, 6621 City - Overland Park State - KS Zip - 66210 Country - USA	9. AGENT'S ADDRESS: Address- 828 Mission Avenue City - San Rafael State - CA Zip - 94901 Country - USA
7. APPLICANT'S PHONE NOS. w/AREA CODE a. Residence b. Business c. Fax Cell: 913-940-3491 913-344-9252 913-433-9629	10. AGENTS PHONE NOS. w/AREA CODE a. Residence b. Business c. Fax Cell: 415.385.1045 415.925.2000 415.925.2006

STATEMENT OF AUTHORIZATION

11. I hereby authorize, Terry Huffman to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.


 _____ 2013-04-19
 SIGNATURE OF APPLICANT DATE

NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE (see instructions) Great Salt Lake Minerals Expansion Project	
13. NAME OF WATERBODY, IF KNOWN (if applicable) Great Salt Lake	14. PROJECT STREET ADDRESS (if applicable) Address Not Applicable (NA)
15. LOCATION OF PROJECT Latitude: +N See attached response Longitude: -W	City - State - Zip -
16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions) State Tax Parcel ID State of Utah Mineral Lease lands Municipality Box Elder County, Utah Section - NA Township - NA Range - NA	

17. DIRECTIONS TO THE SITE

See Attached Response

18. Nature of Activity (Description of project, include all features)

See Attached Response

19. Project Purpose (Describe the reason or purpose of the project, see instructions)

See Attached Response

USE BLOCKS 20-23 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. Reason(s) for Discharge

See Attached Response

21. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards:

Type
Amount in Cubic Yards

Type
Amount in Cubic Yards

Type
Amount in Cubic Yards

See Attached Response

See Attached Response

See Attached Response

22. Surface Area in Acres of Wetlands or Other Waters Filled (see instructions)

Acres See Attached Response

or

Linear Feet Not Applicable

23. Description of Avoidance, Minimization, and Compensation (see instructions)

See Attached Response

24. Is Any Portion of the Work Already Complete? Yes No IF YES, DESCRIBE THE COMPLETED WORK

25. Addresses of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody (if more than can be entered here, please attach a supplemental list).

a. Address- See Attached Response

City - State - Zip -

b. Address-

City - State - Zip -

c. Address-

City - State - Zip -

d. Address-

City - State - Zip -

e. Address-


City - State - Zip -


26. List of Other Certificates or Approvals/Denials received from other Federal, State, or Local Agencies for Work Described in This Application.

AGENCY	TYPE APPROVAL*	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED
None					

* Would include but is not restricted to zoning, building, and flood plain permits

27. Application is hereby made for permit or permits to authorize the work described in this application. I certify that this information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.


 _____ 2013-04-19 _____
 SIGNATURE OF APPLICANT DATE


 _____ 2013-04-19 _____
 SIGNATURE OF AGENT DATE

The Application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than \$10,000 or imprisoned not more than five years or both.

**April 2013 Amended Permit Application
Support Package:
Great Salt Lake Minerals Pond Expansion
Project,
Great Salt Lake, Utah**

Prepared for:

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Prepared by:

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April 2013

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This document should be cited as: Huffman-Broadway Group, Inc. April 2013 Amended Permit Application Support Package: Great Salt Lake Minerals Pond Expansion Project, Great Salt Lake, Utah. April 2013. San Rafael, California. Prepared for Great Salt Lake Minerals Corporation. 15 pp. plus figures.

1.0. Introduction

1.1. Overview of this Document

This permit application contains basic information required in the Corps permit application form (ENG Form 4345, October 2012). The goal is to provide Corps staff with a clear and concise description of the proposed project and associated impacts to Corps/USEPA jurisdictional waters, with emphasis on those issues of particular interest to the reviewing agencies.

2.0. Responses to Permit Information Items

Information that would not fit within the space allotted on ENG Form 4345 is provided below:

Item 15. Location of Project:

The project is located within the Northwest, Northeast and Southwest portions of the Great Salt Lake (Figures 1, 2, and 3). The latitude and longitude of the approximate center point for the various proposed solar evaporation ponds and supporting facilities is provided below together with the amount of jurisdictional waters associated with each new solar pond location:

New GSLM Pond		Waters of the U.S. (Acres)**	Non-Jurisdictional Uplands	Latitude	Longitude
West Lakeside North Arm Expansion Area:	Phase A-North*	7,502	0	41°14'36.531"N	12°58'42.514"W
	Phase B	11,123	0	41°18'49.596"N	112°56'2.389"W
	Phase C	11,800	0	41°24'2.901"N	112°59'13.744"W
Subtotal		30,425	0		
Outside of West Lakeside Expansion Area:	Phase A-South (jurisdictional waters)	2,731	0	41°13'2.144"N	112°58'23.88"W
	Phase A-South (non-jurisdictional uplands)		14,051		
Subtotal		2,731	14,051		
East Lakeside Expansion Area:	Phase C- Plant Site	1,241	0	41°15'12.625"N	112°20'9.579"W
	Phase C-South Arm/Promontory	1,347	0	41°12'16.769"N	112°26'3.852"W
	Phase C-North Arm	1,753	0	41°15'0.509"N	112°30'9.575"W
Subtotal		4,341	0		
Total	Evaporation pond acreage	37,497	14,051		
	Waters of the U.S. acreage	37,497	0		

* Includes Mineral Return Canal east of new Phase A-North Solar Ponds in North Arm of GSL and Mineral Return Inlet Canal and Pump located in abutting South Arm waters adjacent to UPRR culverts.
 ** No wetlands are filled. Fill impacts occur in "other Waters of the U.S."

Item 17. Directions to the Project Site: .

Directions from Corps Bountiful, UT Office to Lakeside; West Lakeside GSLM Expansion Project Solar Ponds:		Miles
1.	Continue on E 1100 N	0.3
2.	Head west on W 2600 S toward S 625 W	0.2
3.	Merge onto I-15 S	6.7
4.	Take exit 308 to merge onto I-80 W toward Reno	57.4
5.	Take exit 62 toward Military Area ~ Lakeside Road	0.2
6.	Turn right at Military Area ~ Lakeside Road (there will be signs directing you to Lakeside, UT)	3
7.	Lakeside, UT stop at UP Rail Crossing (Meet GSL Representative(s) for escort to project site)	End
Directions from Corps Bountiful, UT Office to GSLM Expansion Project Processing Plant and East Lakeside Solar Ponds:		Miles
1.	Start out going WEST on W 2600 S toward S 625 W	0.4
2.	Merge onto I-15 N toward OGDEN	29.8
3.	Take the 12TH ST./ UT-39 exit, EXIT 344	0.3
4.	Turn RIGHT onto UT-39/ W 12TH ST/ W 1200 S . Continue to follow UT-39	4.1
5.	UT-39 becomes W 1150 S	1.2
6.	W 1150 S becomes W 900 S	4.7
7.	Turn RIGHT onto S 9300 W	1.3
8.	S 9300 W becomes W 450 N	0.9
9.	Turn RIGHT onto N 10100 W	0.1
10.	End at 765 N 10500 W Ogden, UT 84404 (Meet GSL Representative at processing plant office for escort to project site)	End

Item 18. Nature of Activity (Description of Project, Include all features):

The project activity requiring Corps authorization is the placement of fill material into the Great Salt Lake in order to construct solar evaporation ponds and supporting facilities. The dikes and supporting facilities, which include canals, dike access roadways, pump station pads, north and south arm intake canals, and water control structures, would need to be constructed using fill material in order to develop solar evaporation ponds for the purpose of potassium sulfate fertilizer production (Figures 1, 2, and 3).

Phase A (estimated year of implementation 2015)

The initial phase of expansion is entirely on the west side of the North Arm of the Great Salt Lake, immediately south of GSLM's existing solar evaporation ponds. GSLM proposes 24,284 acres of new evaporation ponds primarily within the South Clyman Bay Lease area, 14,051 acres of which is considered uplands and not regulated "waters of the United States." 107.3 acres of dredged or fill material would be discharged into regulated "waters" below the 4205-foot elevation meander line in order to construct 130,141 linear-feet of containment levees, as well as 20,521 linear-feet of containment dikes for new channels to convey circulation water to and from idled ponds in order to return accumulated salts to the North Arm. All wetland areas will be avoided.

Because the new levees would utilize pond sealing technology, pumping of North Arm water for evaporation would decrease during Phase A compared to current operations.

An additional 225,000 acre-feet of lower salinity South Arm water, withdrawn near the breach in the UP causeway,¹ would be circulated by way of a newly constructed mineral return canal through idled ponds annually in order to dissolve and return accumulated minerals to the North Arm. Water used for circulation will not be consumed and will be returned to the lake, less minor evaporation that will occur during circulation. Therefore total brine consumption for Phase A, both for new sealed ponds and for mineral return in idled ponds, will be 95,646 acre-feet per year, well within GSLM's existing water right of 156,000 acre-feet annually.

In Phase A, roughly half of the ponds would be idled each year for mineral return. This is a higher percentage of pond area idling than in later phases because of pond configuration restraints. Nevertheless, pond-based SOP production capacity is expected to increase to 767,000 tons annually, as a result of the practicability of sealing the new exterior levees. This compares to 450,000 tons annually before GSLM improved plant efficiencies and implemented pond sealing, but also before GSLM lost access to a previously available source of raw materials from Canada (see Table 2).

GSLM will continue to repurpose existing ponds at its east side plant site from evaporation to harvest in order to accommodate the increased production.

Phase B (10 years after the completion of Phase A)

New evaporation ponds are proposed to the north and east of GSLM's existing west side ponds. No new ponds are proposed for the east side due to continued repurposing of existing east side ponds. GSLM proposes 11,123 acres of new evaporation ponds that would be created by construction of a 82,473-foot dike, resulting in the filling of 120.1 acres of "waters of the United States "and impounding 11,123 acres of "waters of the United States." These ponds would be periodically idled in order to return unused minerals to the North Arm in a sustainable rotation with the existing west side ponds and with the ponds developed in Phase A. Overall, roughly one-third of the west side ponds would be idled annually.

Because the new levees would utilize pond sealing technology and encapsulate the somewhat porous dikes of the current west side operation, pumping of North Arm water for evaporation would be less during Phase B than during current operations. An additional 99,000 acre-feet of lower salinity South Arm water would be circulated through roughly one third of the west side ponds that would be idled ponds annually in order to dissolve and return unused minerals to the North Arm, compared to the Phase A mineral return process. Water used for circulation will not be consumed and returned to the lake, less minor evaporation that would occur during circulation. Therefore total brine consumption for Phase B, both for evaporative production in new sealed ponds

¹ Water would be withdrawn immediately south of the existing breach in the Union Pacific railway causeway where lower-salinity South Arm water enters the North Arm near Strong's Knob.

and for sustainable mineral return in idled ponds, will be 134,000 acre-feet per year, well within GSLM's existing water right of 156,000 acre-feet annually.

Phase B would provide a 3-mile buffer between the outermost levee and Gunnison Island, home of a valued pelican colony. Lake bathymetry indicates there would not be a "land bridge" for potential predators from the levee to the island unless lake level fell below 4193 feet; GSLM's new project proposal calls for a predator management plan to be developed in cooperation with relevant agencies, and implemented if and when the lake level falls below 4194 feet in order to deny predator access from the levee to the island. As with Phase A (as well as with Phase C), all wetland areas are to be avoided.

Pond-based SOP production capacity is expected to increase to 945,000 tons annually in Phase B. This compares to 450,000 tons annually before GSLM improved plant efficiencies and implemented pond sealing, but also before GSLM lost access to a previously available source of raw materials from Canada (see Table 2).

As with Phase A, above, GSLM will continue to repurpose existing ponds at its east side plant site, converting remaining evaporation ponds to harvest ponds in order to accommodate the increased production.

Phase C (10 years after completion of Phase B)

New evaporation ponds are proposed to the north of GSLM's ponds constructed in Phase B, and on the east side of the lake outside of Bear River Bay. GSLM proposes 11,800 acres of new evaporation ponds on the west side of the lake that would be created by construction of a 112,663-foot dike, resulting in the filling of 129.5 acres of "waters of the United States" and impounding 11,800 acres of "waters of the United States." An inner dike will be configured along the western lake margin to provide a buffer around a seep area that may provide nesting habitat for snowy plover. A 4,251 foot intake canal would be extended northeastward to a lake depth of 4191 feet from the intersection of the outer southern Phase C and northern Phase B dikes resulting in a 4.9-acre fill discharge into "waters of the United States" would be constructed to provide North Arm brine. All wetland areas would be avoided.

These new evaporation ponds would be periodically idled in order to return accumulated minerals to the North Arm, in rotation with existing west side ponds and the ponds developed in Phases A and B. Again, roughly one-third of all west side ponds would be idled annually as part of this mineral return program.

On the east side of the lake, the efficiencies of repurposing existing ponds will have been exhausted, so 4,341 acres of new solar evaporation ponds would be developed. All would be outside of Bear River Bay, with 1,753 of these acres in the North Arm of the lake on the western side of Promontory Point, 1,347 acres in the South Arm along the southern end of Promontory Point, and 1,241 acres in a trapezoidal area bordering

GSLM's east side ponds, north of the Union Pacific causeway. The associated 203,945-foot dike construction would result in the filling of 274.0 acres of "waters of the United States" and impounding 4,341 acres of "waters of the United States." A 377-acre area in the South Arm along the southeastern end of Promontory Point will be used to construct pile supported breakwater structures to protect the western edge of the solar ponds. The placement of fill material is not necessary for the construction of breakwater structures within this area. GSLM identified these locations through extensive efforts to determine environmentally preferable sites outside of Bear River Bay for its east side pond expansion within its existing leaseholds.

In particular, GSLM consulted with federal and state agencies, the Audubon Society, Friends of the Great Salt Lake, and published experts on Great Salt Lake avian activity. On the basis of these consultations, GSLM believes that the least environmentally damaging alternative pond locations would be a series of narrow ponds around the western and southern end of Promontory Point, and a pond within a trapezoidal area north of the Union Pacific causeway adjacent to GSLM's existing east side ponds (Figure 3).²

Pumping of North Arm water for evaporation would rise in Phase C to 140,000 acre-feet annually. This compares to 156,000 acre-feet that GSLM pumped annually with its existing operations before it implemented within-plant efficiency improvements and pond sealing technology on its existing exterior dikes. An additional 106,000 acre-feet of lower salinity South Arm water would be circulated non-consumptively through idled ponds annually in order to return unused salts to the North Arm. Total water consumed at the completion of Phase C includes 140,000 acre feet for brine evaporation, and 34,200 acre feet of evaporated mineral return circulation water.

SOP production would increase to 1,205,000 tons annually. This compares to 450,000 tons annually before GSLM improved plant efficiencies and implemented pond sealing, but also before GSLM lost access to a previously available source of raw materials from Canada (see Table 2).

² From the perspective of cost-effectiveness, it would be far preferable for GSLM to expand immediately adjacent to its existing ponds at its plant site. This fact drove its initial proposal for expansion within Bear River Bay. In GSLM's consultations with agencies and environmental organizations regarding minimizing or withdrawing its Bear River Bay pond expansion proposal, GSLM was encouraged by waterfowl hunters to consider areas in north Ogden Bay, immediately south of the Union Pacific causeway as an environmentally superior alternative to Bear River Bay. GSLM developed a preliminary alternative proposal that included a 3,300-acre pond in this north Ogden Bay location and in April 2013 discussed this possibility with federal and state agencies, the Audubon Society, Friends of the Great Salt Lake, and published experts on Great Salt Lake avian activity. Whereas there were limited scientific data to document concerns that were raised, it was clear that these parties considered a project with ponds around Promontory Point to be environmentally superior to a project with ponds in the north Ogden Bay site. There was little question, however, that a project with ponds in the north Ogden Bay site is environmentally superior to expansion within Bear River Bay.

Table 1. Estimates of SOP production since 2009 including GSLM's operational changes including SOP purchase from a South Arm source			
Description of Operations	West Side Ponds (Acres)	East Side Ponds (Acres)	Annual SOP Production (Tons)
Existing operations in 2009	25,383	22,140	450,000
Existing without Canadian imports	25,383	22,140	250,000
Existing operations plus within-in plant efficiency improvements	25,383	22,140	350,000
Existing + future plant improvements and dike sealing	25,383	22,140	570,000
Total Incremental change from 2009 operations	0	0	+120,000

Table 2. Estimates of SOP Production for Phased Expansion of the Great Salt Lake Minerals Company Facilities					
Phase	Expansion (new solar pond acres)			SOP Production (tons/year)	
	West Lakeside	East Lakeside	Within Waters of the United States	Incremental Difference "+"	Total
"No Project" Alternative (Existing operations with plant improvements and dike sealing)	0	0	0	0	570,000
"Applicant's Proposed Project:					
Phase A with PTE applied to new west ponds levees, plus circulation water canal, plus 33% of west side ponds idled for salt return to North Arm (Phase A-South 16,782 acres + Phase A-North 7,502 acres = 24,284 acres; 14,051 acres are non-jurisdictional uplands and 2,731 acres are "waters of the U.S.").	24,284	0	10,223	+197,000	767,000
Phase B with PTE applied to west ponds, plus 33% of west side ponds idled for salt return to North Arm	11,123	0	11,123	+178,000	945,000
Phase C with PTE applied to west and east ponds, plus 33% of west side ponds idled for salt return to North Arm	11,800	4,341	16,141	+260,000	1,205,000
Total Net Increases in Solar Pond Project Size and SOP Production from "No Project" Alternative	47,207	4,341	37,497	+635,000	1,205,000

Item 19. Project Purpose:

Basic and Overall Project Purpose: The Corps has determined that "the basic project purpose is potassium sulfate extraction/mining, and that the overall project purpose is to increase production/output of organically certified potassium sulfate to help meet the increasing demand for this type of fertilizer."³

³ See Corps Public Notice Number 2007-00121.

Project Need: The applicant believes there is a need to increase production of potassium sulfate in order to maintain its market share over the next 30 years for the following reasons:

1. Replace the annual loss of 200,000 tons of potassium sulfate production that will ensue after cost-effective imports of potassium chloride raw material from Canada become unavailable.
2. Increase production/output of potassium sulfate from the Great Salt Lake, the only United States source, to help meet increasing U.S. and worldwide demand for potassium sulfate fertilizer versus fertilizers with high chloride content. Potassium sulfate from Great Salt Lake Minerals Corporation is the only organic-approved potassium sulfate fertilizer, listed by Organic Materials Review Institute as allowable for use in organic agriculture.
3. Meet, to the extent practicable within the reasonably foreseeable future, the projected annual demand by organic and traditional growers in the United States for 1.2 million tons of potassium sulfate. The estimate is based on food consumption statistics for the past 20 years and projections of population growth and food consumption for the next 30 years developed by the U.S. Census Bureau, the U.S. Department of Agriculture, and the United Nations Food and Agriculture Organization.
4. Retain and increase the customer base by demonstrating long-term market viability.

Item 20. Reason for Discharge:

The proposed pond expansion requires the construction of dikes, canals, access roadways, pump station pads, north and south lake intake canals, and water control facilities in order to annually operate 51,548 acres of new solar evaporation ponds.

Item 21. Type of Material Being Discharged and the Amount of Each Type:

Clean fill used to construct the dikes, canals, roadways, pump station pads, north and south lake intake canals, and water control structures would primarily come from quarry areas located around the Great Salt Lake that are geologically consistent with the lake bed and lake bottom clays. Approximate centers of the outer solar evaporation pond dikes would be sealed with cement bentonite (Figure 4). The table below describes the location, amount, and type of fill material proposed to be used.

Pond Location & Name		Yds ³ Fill Placed into Waters of the US	Type of Fill Material	Source
West Side of Lake Expansion:	Phase A-North*	162,000.6	Clean quarry rock & cement bentonite	Quarries located north and west of lake
	Phase B	1,933,377		
	Phase C	1701897.8		
	Phase B/C –Intake Canal	161,513.9		
	Phase A –Mineral Return Canal	33,763.3		
	subtotal	3,992,652.6		
Outside of Lake Expansion:	Phase A- South	61,792		
East Side of Lake Expansion:	Phase C- Plant Site	1,651,676	Clean quarry rock & cement bentonite	Quarry(ies) located at Promontory Point
	Phase C- South Arm/Promontory	1,303,301		
	Phase C-North Arm	1,058,963		
	subtotal	4,013,940.6		
Total Fill		8,068,384.6		

* Includes mineral return and inlet canals.

Item 22. Surface Area in Acres of Wetlands or Other Waters Filled:

No wetlands will be filled by the Project.

The applicant has determined that approximately 611.0 acres of waters of the United States would be lost due to the placement of fill for dike construction under the proposal.

Item. 23. Description of Avoidance, Minimization, and Compensation:

GSLM’s 2009 expansion plan was based on estimates utilizing publicly available market and census data to project a 2-3% annual growth trend in SOP demand over the next 4 or 5 decades, reaching approximately 1.5 million tons of SOP per year 50 years in the future. In order to produce this volume of SOP, the 2009 expansion proposal, as described in the Corps’ EIS scoping document (May 2009) included an ultimate build-out of approximately 83,000 acres of new evaporation ponds on the west side of the North Arm and 8,000 acres of new ponds on the east side of the lake adjacent to GSLM’s existing ponds on Bear River Bay; this total of 91,000 acres of new ponds would have been entirely within regulated “waters of the United States.” Furthermore, the permit application included a plan to seek additional water rights to pump 353,000 acre feet per year of North Arm brine into the new and existing solar evaporation ponds on the west side of the lake, as well as improvements to increase the capacity of the existing Behrens Trench to transport saturated brines from west side evaporation pond to the plant site on Bear River Bay.

The size of this overall proposal and its projected expansion in Bear River Bay raised concerns from federal and state agencies, as well as from some members of the public.

In particular, Bear River Bay is recognized as containing important waterfowl and shorebird habitat in the Great Salt Lake basin, and GSLM's proposed 8,000-acre expansion therein, while justifiable from a minerals-production standpoint, was considered particularly adverse environmentally by the agencies and some members of the public.⁴ Similarly, the proposed increase in annual pumping to withdraw larger quantities of North Arm brine raised questions about the potential impact of the project on overall lake levels and salinities.

Efforts to Avoid Direct and Indirect Impacts:

GSLM has explored alternatives that could reduce its 1) project footprint (particularly within Bear River Bay), 2) water use, 3) impounding of Great Salt Lake waters, and 4) proposed discharges of fill material into the "waters of the United States" within the Great Salt Lake basin. GSLM responded by investigating potential means of increasing its efficiency of production, the acquisition of raw materials from alternative sources, and the availability of alternative properties where evaporation ponds could be constructed in less damaging areas, including outside of regulated "waters of the United States."

Some of these investigations were fruitful. GSLM identified and invested in capital upgrades to improve efficiency at its plant. More important, in 2010 GSLM tested improved methods for sealing its existing levee system. Whereas its earlier experimentation had led GSLM to conclude that pond sealing was not practicable, the company found that its new pond technology could 1) be cost-effective in significantly reducing leakage, 2) greatly reduce proposed water withdrawals under its water rights, and 3) increase per-acre productivity of SOP. The results of these efforts are shown in Table 1 (above), yielding a 120,000 ton increase in SOP production over production levels at the time GSLM initially applied for permits to expand in 2007.

Some other efforts to reduce impacts by acquiring less damaging sites for expansion failed, at least initially. For example, GSLM was an unsuccessful bidder in its attempts to acquire lease rights to mineral deposits at Sevier Lake, a site that may have provided an albeit limited alternate source of SOP. Similarly, GSLM was unable initially to acquire another west side property (called the Colman Lease or the Solar Resources Lease) where thousands of acres of evaporation ponds could have been constructed adjacent to the North Arm outside of the "waters of the United States;" the leaseholder was unwilling to consider selling its interests to GSLM, and this alternative was deemed by GSLM and the Corps to be not practicable under the regulations. GSLM had also been unsuccessful in attempts to secure additional raw materials from a source in the South Arm of the Great Salt Lake.

⁴ As noted in footnote 3, above, GSLM had previously been authorized to expand into roughly 18,000 acres of Bear River Bay, with the support of State and Federal resource agencies pursuant to an agreed-upon mitigation plan. As such, GSLM had not anticipated the strong objections to its much smaller 8000-acre expansion proposal in 2009.

However, in 2012, the ownership of the Colman Lease changed, and, the successors in interest sold their interest in the Colman Lease (now called the South Clyman Bay Lease) to GSLM. This provided GSLM with a site containing 14,051 acres of uplands suitable for use as evaporation ponds, thereby avoiding impacts to a similar acreage of regulated “waters of the United States.”

Similarly, GSLM was able to enter into a short-term agreement to acquire raw material for SOP production from a South Arm source,⁵ thereby fulfilling market demand in 2012 following the wet and cool weather that had reduced solar evaporation during 2011, and avoiding impacts associated with new evaporation ponds to produce similar quantities of SOP.

Recognizing the concerns about potential impacts to a valued pelican colony on Gunnison Island, GSLM evaluated reconfiguring proposed west side levees to ensure an adequate buffer. GSLM proposes no dikes or ponds within a minimum of three miles of any portion of Gunnison Island.

Finally, GSLM sought to identify alternative sites for east side expansion in order to avoid any further incursion into Bear River Bay habitats. GSLM believes it has identified alternatives that make this avoidance of Bear River Bay impacts practicable.

Efforts to Minimize Direct and Indirect Impacts:

Through its assessment of long-term operations and efficiencies, GSLM determined that it could change its approach in dealing with deposits of unused salts in its west side evaporation ponds. This accretion has led GSLM to raise containment levees periodically to maintain pond capacity and, importantly, would significantly lengthen the time that would be required to restore these pond areas in the future. Similarly, some commenters raised concerns that if accretion practices were to continue unabated, the lake’s salinity might be affected adversely.

Accordingly, GSLM is proposing a conceptual element of its expansion plan that would periodically idle a significant portion of new and existing evaporation ponds annually in order to circulate lower salinity water non-consumptively through the idled ponds to dissolve and return the accumulated minerals to the North Arm of the Lake; GSLM proposes to capture lower salinity South Arm water adjacent to the existing breach in the Union Pacific causeway where South Arm water is entering the North Arm. GSLM has shared this conceptual plan with the Corps, various environmental advocacy groups, State and federal agency representatives, and other lake constituents; to date, all have encouraged the company to incorporate these mineral-return procedures into its

⁵ This material purchased from a South Arm source proved to be of insufficient quality chemically to be a legitimate longer-term source of SOP raw materials, and the contract was not renewed.

revised proposal as a less-damaging alternative to any similarly sized expansions without this recirculation.

GSLM also carefully assessed potential alternatives for its necessary east side expansion, in order to avoid expanding into Bear River Bay. GSLM was constrained to its existing lease holdings and to bathymetric limitations for levee construction. GSLM was able to identify several alternative sites, including areas in north Ogden Bay and along the southern end of Promontory Point. GSLM believes there is no question that any of these alternatives is environmentally preferable to its previous proposal for expansion within Bear River Bay, and GSLM no longer intends to pursue Bear River Bay expansion.

The overall size of GSLM's proposed expansion has been reduced substantially. Its proposal for west side expansion has been reduced from 83,000 acres to 47,207 acres, 14,051 acres of which are considered non-jurisdictional uplands under CWA regulations. As such, the proposed west side expansion into "waters of the United States" has been reduced by 60% (33,156 acres).

And, finally, the Corps and EPA asked GLSM to consider a phased approach to its proposed long-term expansion, whereby an initial portion of its proposed expansion could be implemented, and subsequent phases could be held in abeyance pending assessments of biological, hydrologic, and salinity impacts of each previously implemented phase. GSLM has agreed to adopt this "adaptive management" approach.

The Bases for GSLM's Revised Project:

The aforementioned efforts to identify and/or acquire environmentally preferable alternatives, as well as the positive results of the levee-sealing project, have led GSLM to propose a revised plan. This new project plan will a) significantly reduce the size of the projected expansion, its consumptive water use, and its potential for adverse environmental impacts, and b) formalize a phased "adaptive management" approach as requested by the agencies.

The revised proposal has been guided by a number of significant developments:

1. Through further discussions with the Corps and in face-to-face meetings with concerned public organizations, GSLM no longer plans any expansion within Bear River Bay, and, by more efficiently repurposing many of its existing east-side ponds, intends to reduce and delay expansion on the east side of the Lake;
2. GSLM's pond sealing investment, completed in 2012 on all perimeter levees surrounding its east side ponds, has resulted in less water usage and greater yield in tons of SOP per acre of ponds. The geologic properties of the west side

levees make sealing existing west side levees impractical,⁶ but by incorporating these pond technology efficiencies in new levees built for the expansion project, GSLM can enclose the existing ponds and achieve a similar reduction in water consumption on the west side that it experienced on the east side. Thus GSLM can meet the higher production targets of the expansion project without seeking any additional consumptive water right; in fact, because of pond sealing, GSLM would withdraw less brine from the lake for mineral production at all phases of the expansion project than it does today;

3. GSLM proposes major operational modifications that would enable new as well as existing evaporation ponds to be periodically and sequentially idled in order to circulate lower salinity water (captured adjacent to the existing breach where South Arm water enters the North Arm) through the idled ponds non-consumptively⁷ and return accumulated minerals to the North Arm of the Lake. In doing so, GSLM believes, and the Corps agrees, that the revised, sustainable operations can reduce the potential impacts of GSLM's operations on Lake salinities, as well as to greatly facilitate the future restoration of the evaporation ponds whenever the company's mineral extractions eventually cease;
4. The ownership of the Colman Lease (now known as the South Clyman Bay Lease) changed. Following the December 2011 death of Solar Resources' principal owner, in 2012 remaining owners and the executor of the principal owner's estate sold Solar Resources Inc. to GSLM; after necessary public notice, relevant state agencies approved the continuation of Solar Resources Inc.'s leasehold and water rights by GSLM as its successor company. Whereas the Corps had previously agreed to eliminate this area from further alternatives analysis as being unavailable and therefore not "practicable" under the regulations, this alternative is now, in fact, "practicable" and part of GSLM's revised project proposal. And, because much of this lease holding is outside of federal CWA jurisdiction, GSLM's utilization of this property for evaporation ponds will significantly reduce its direct impacts on regulated "waters of the United States;" and
5. After conducting further analyses of the costs and logistic challenges associated with increasing the capacity of the existing Behrens Trench, as well as the uncertainties associated with long-term market projections for SOP demand 40 or more years in the future, GSLM is limiting its proposed expansion to a 30-year projection which it intends to pursue in three phases under an "adaptive management" permitting approach. No expansion of the Behrens Trench is

⁶ Existing west side levees were constructed of materials that are not suited for after-the-fact levee sealing. New levees, proposed outboard of these will serve to seal the overall west side pond system to prevent leakage.

⁷ When compared to the overall evaporation rate of the water in the North Arm, there would likely be a small increase in the evaporation rate of the recirculation water as it moves through the idled ponds before being returned to the North Arm. The recirculation water with the salts dissolved from the idled ponds will still be well below the salinity of the North Arm receiving waters.

proposed inasmuch as expansion of the Trench size a) could not serve to reduce the acreage of ponds needed and b) is unnecessary to support the increased volume that would be produced following the proposed new pond construction on the west side.

Accordingly, the revised permit application responds to comments received during the Corps' 2009 EIS scoping and public comment period, and results in significant impact reductions in proposed impacts to waters of the United States. GSLM has already begun implementing its levee sealing and within-plant improvements as less-damaging practicable alternatives, as neither requires federal authorization (see Table 1). Nevertheless, these improvements are outgrowths of the analyses of alternatives that GSLM has continued to evaluate and, where possible, implement since entering the permit process in 2009.

Compensation:

GSLM will be submitting a proposed compensation package under separate cover following discussions regarding the amended application materials submitted, herein.

Item 25. Addresses of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody:

Owner	Owner
Mike Nelson U.S. Department of the Interior Bureau of Land Management Salt Lake Field Office 2370 South 2300 West Salt Lake City UT 84119	Southern Pacific Transportation Inc x/o Mineral Lease owner: L.W. Bennett 1 East First St #905 Reno, NV
Dave Grierson Utah Division of Forestry, Fire and State Lands 1594 W. North Temple, Suite 3520 PO Box 145703 Salt Lake City, UT 84114-5703	W.F. Goring & Son 9940 N Highway 38 Deweyville, UT 84309
Utah Division of Water Resources 1594 West North Temple #310 PO Box 146201 Salt Lake City, Utah 84116	Charles W Roberts Mountain Valley Land LLC. 2306 Tarragon Lane New Port Richey, FL 34655
Kevin Carter Utah Division of Natural Resources Utah Schools & Institutional Trust Lands 675 East 500 South, Suite 500, Salt Lake City, Utah 84102	Wide Open Spaces LLC 695 S Main #6 Brigham City, UT 84302

Dee's Inc. 777 E 2100 S Salt Lake City, UT 84106	Harold Selman, Inc. 11400 N 4130 W Tremonton, UT 84337
Young Resources, LTD 4990 N Highway 38 Brigham City, UT 84302	

Figures

- Figure 1 Project Vicinity Map, GSLM Expansion Project
- Figure 2 Project Location Map, West Lakeside Pond Expansion
- Figure 3 Project Location Map, East Lakeside Pond Expansion
- Figure 4 Typical Section Drawings Showing Dike and Roadway Construction

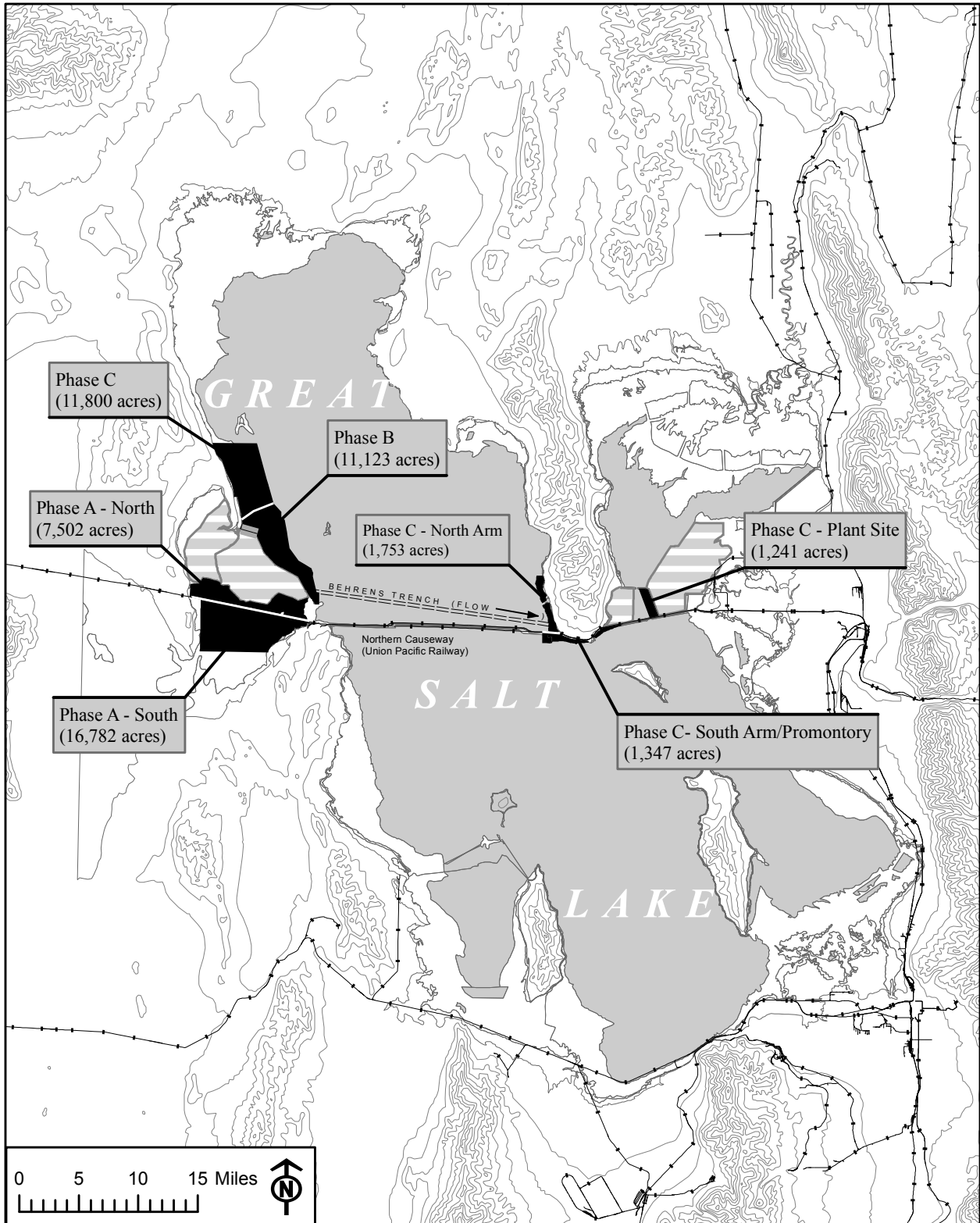


FIGURE 1. PROJECT VICINITY MAP, GSL EXPANSION PROJECT
APPLICATION BY: Great Salt Lake Minerals Corp.
 P.O. Box 1190, Ogden, UT 84402
APPLICANT'S AGENT: Terry Huffman, PhD,
 Huffman-Broadway Group; Tel: 415.385.1045
 email: thuffman@h-bgroup.com

PURPOSE: Basic project purpose is potassium sulfate extraction/mining.
PROPOSED FILL IN: waters of the United States
AT: Great Salt Lake
COUNTIES OF: Box Elder and Weber **STATE:** Utah

ADJACENT PROPERTY OWNERS: 1. BLM, 2. Utah Division of Forestry, Fire and State Lands, 3. Utah Trust Lands
DATUM: MSL
Date: 4-23-2013

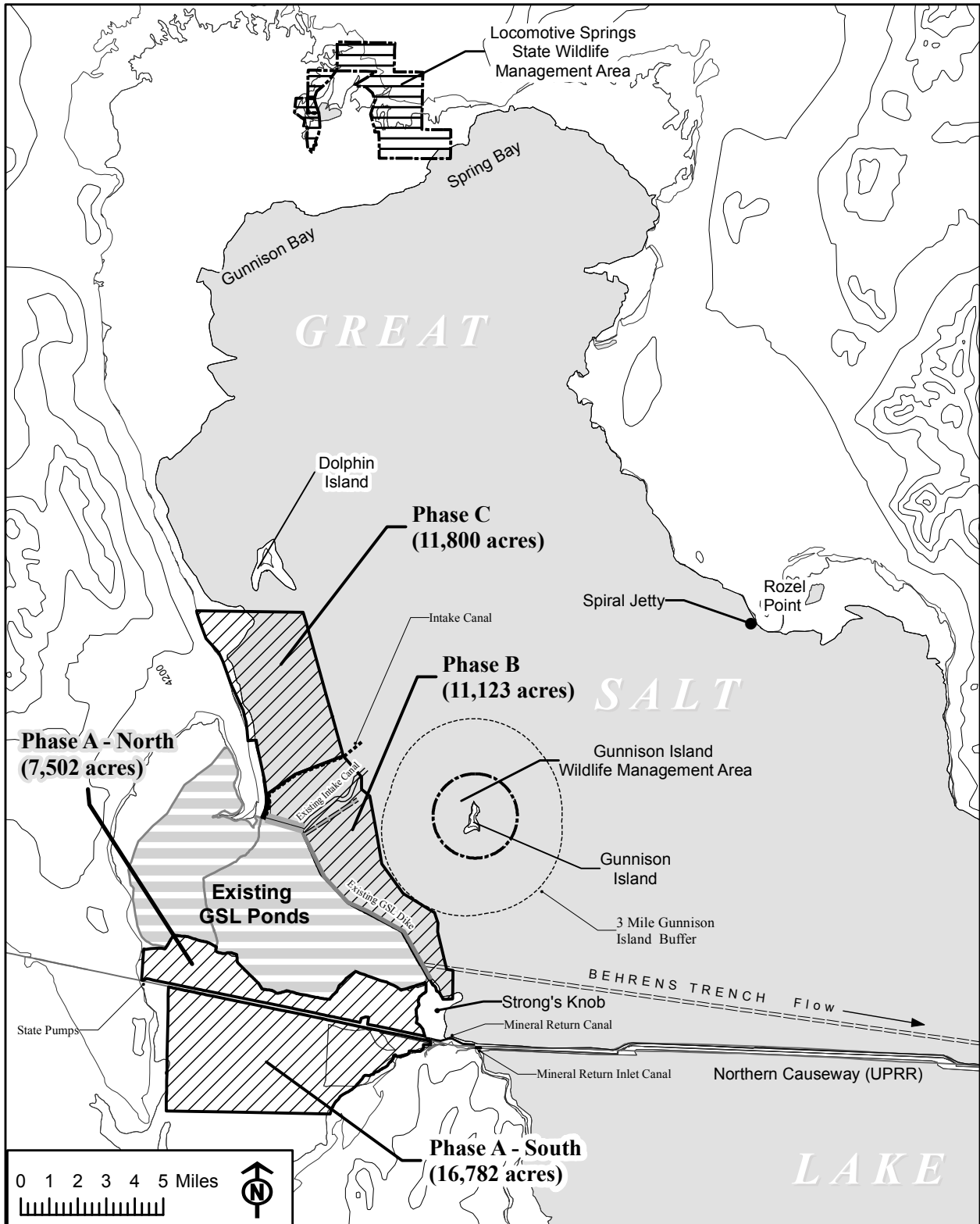


FIGURE 2. PROJECT LOCATION MAP, WEST POND EXPANSION, NORTH ARM, GREAT SALT LAKE
APPLICATION BY: Great Salt Lake Minerals Corp.
 P.O. Box 1190, Ogden, UT 84402
APPLICANT'S AGENT: Terry Huffman, PhD,
 Huffman-Broadway Group; Tel: 415.385.1045
 email: thuffman@h-bgroup.com

PURPOSE: Basic project purpose is potassium sulfate extraction/mining.
PROPOSED FILL IN: waters of the United States
AT: Great Salt Lake
COUNTIES OF: Box Elder and Weber **STATE:** Utah

ADJACENT PROPERTY OWNERS: 1. BLM, 2. Utah Division of Forestry, Fire and State Lands, 3. Utah Trust Lands
DATUM: MSL
Date: 4-23-2013

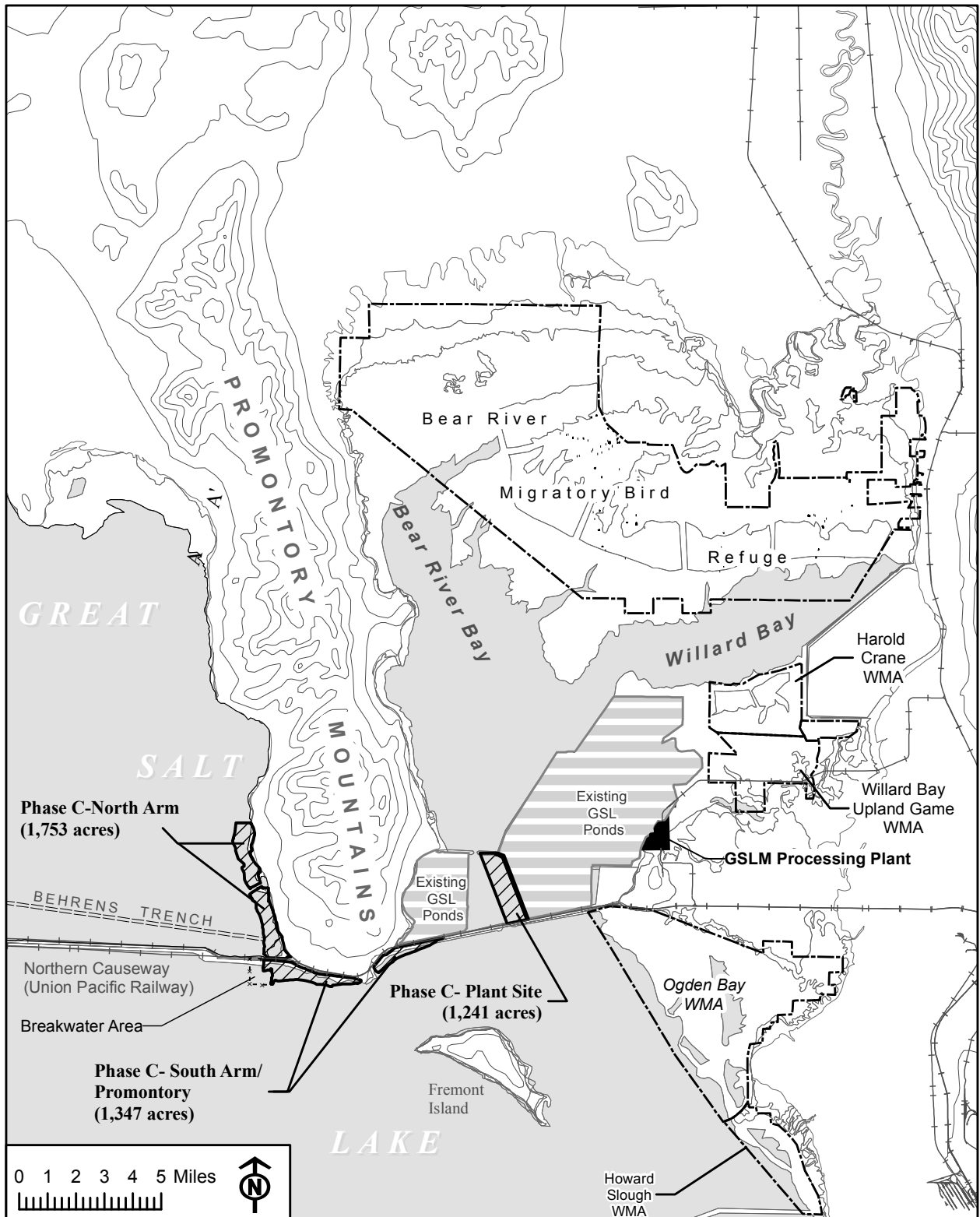
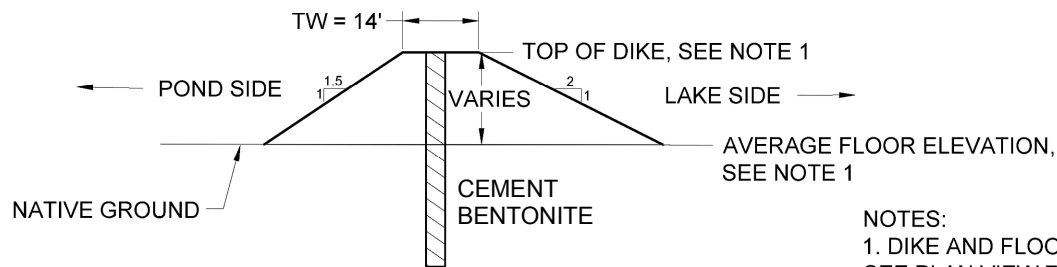
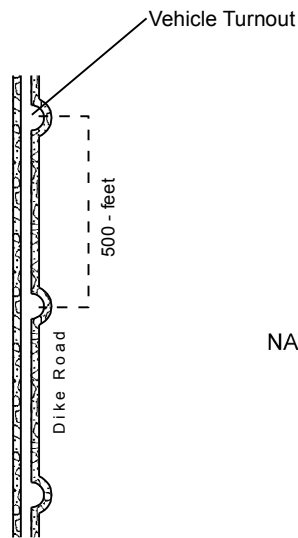


FIGURE 3. PROJECT LOCATION MAP, EAST POND EXPANSION, GREAT SALT LAKE
APPLICATION BY: Great Salt Lake Minerals Corp.
 P.O. Box 1190, Ogden, UT 84402
APPLICANT'S AGENT: Terry Huffman, PhD,
 Huffman-Broadway Group; Tel: 415.385.1045
 email: thuffman@h-bgroup.com

PURPOSE: Basic project purpose is potassium sulfate extraction/mining.
PROPOSED FILL IN: waters of the United States
AT: Great Salt Lake
COUNTIES OF: Box Elder and Weber **STATE:** Utah

ADJACENT PROPERTY OWNERS: 1. BLM, 2. Utah Division of Forestry, Fire and State Lands, 3. Utah Trust Lands
DATUM: MSL
Date: 4-23-2013



NOTES:

1. DIKE AND FLOOR ELEVATIONS VARY. SEE PLAN VIEW FOR DIKE AND FLOOR ELEVATIONS OF SPECIFIC DIKES.
2. IN-POND DIKES HAVE 1.5:1 SIDE SLOPES ON BOTH SIDES OF DIKE.

Plan View

Perimeter Dike Section

FIGURE 4. TYPICAL SECTION DRAWINGS SHOWING DIKE AND DIKE ROADWAY CONSTRUCTION

APPLICATION BY: Great Salt Lake Minerals Corp.
P.O. Box 1190. Ogden, UT 84402

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email: thuffman@h-bgroup.com

PURPOSE: Basic project purpose is potassium sulfate extraction/mining.

PROPOSED FILL IN: waters of the United States
AT: Great Salt Lake
COUNTIES OF: Box Elder and Weber **STATE:** Utah

ADJACENT PROPERTY OWNERS: 1. BLM, 2. Utah
Division of Forestry, Fire and State Lands, 3. Utah Trust Lands

DATUM: MSL
Date: 4-23-2013