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DOCKET NO. 52485

APPLICATION OF SOUTHWESTERN PUBLIC SERVICE COMPANY TO AMEND ITS CERTIFICATE OF CONVENIENCE AND NECESSITY TO CONVERT HARRINGTON GENERATING STATION FROM COAL TO NATURAL GAS	**§ § § § § § §**	**PUBLIC UTILITY COMMISSION OF TEXAS**

SOUTHWESTERN PUBLIC SERVICE COMPANY'S
RESPONSE TO SIERRA CLUB'S
FIRST REQUEST FOR INFORMATION
QUESTION NOS. 1-1 THROUGH 1-31
(*Filename*: SPSRespSierraClub1st.doc; *Total Pages*: 164)

EXHIBITS ATTACHED:

DOCKET NO. 52485

APPLICATION OF SOUTHWESTERN PUBLIC SERVICE COMPANY TO AMEND ITS CERTIFICATE OF CONVENIENCE AND NECESSITY TO CONVERT HARRINGTON GENERATING STATION FROM COAL TO NATURAL GAS	§ § § § § § § §	**PUBLIC UTILITY COMMISSION OF TEXAS**

SOUTHWESTERN PUBLIC SERVICE COMPANY'S RESPONSE TO SIERRA CLUB'S FIRST REQUEST FOR INFORMATION QUESTION NOS. 1-1 AND 1-31

Southwestern Public Service Company ("SPS") files this response to the Sierra Club's First Request for Information, Question Nos. 1-1 and 1-31. SPS has provided notice, by email, to all parties that SPS's Responses to Sierra Club's 1st Request for Information and accompanying exhibits (excluding voluminous and exhibits provided pursuant to the protective order) have been filed with the Commission and are available for download from the Commission's Interchange website.

I. WRITTEN RESPONSES

SPS's written responses to Sierra Club's First Request for Information are attached and incorporated by reference. Each response is stated on or attached to a separate page on which the request has been restated. SPS's responses are made in the spirit of cooperation without waiving SPS's right to contest the admissibility of any of these matters at hearing. In accordance with 16 Tex. Admin. Code § 22.144(c)(2)(A) ("TAC"), each response lists the preparer or person under whose direct supervision the response was prepared and any sponsoring witness. When SPS provides certain information sought by the request while objecting to the provision of other information, it does so without prejudice to its objection in the interests of narrowing discovery

disputes under 16 TAC § 22.144(d)(5). Pursuant to 16 TAC § 22.144(c)(2)(F), SPS stipulates that its responses may be treated by all parties as if they were made under oath.

II. INSPECTIONS

If responsive documents are more than 100 pages but less than eight linear feet in length, the response will indicate that the attachment is voluminous ("(V)") and, pursuant to 16 TAC § 22.144(h)(2), the exhibit will be made available for inspection at SPS's voluminous room at 600 Congress Avenue, Suite 2000, Austin, Texas 78701; telephone number (512) 721-2700.

If a response or the responsive documents are provided pursuant to the protective order in this docket, the response will indicate that it or the attachment is either confidential ("CONF") or highly Sensitive ("HS") as appropriate under the protective order. Access to Confidential and Highly Sensitive materials will be available on Coffin Renner's file sharing link to all parties that have signed and filed the certification under the protective order entered in this docket. Confidential and Highly Sensitive responsive documents will also be made available for inspection at SPS's voluminous room, unless they form a part of a response that exceeds eight linear feet in length; then they will be available at their usual repository in accordance with the following paragraph. Please call in advance for an appointment to ensure that there is sufficient space to accommodate your inspection.

If responsive documents exceed eight linear feet in length, the response will indicate that the attachment is subject to the FREIGHT CAR DOCTRINE, and, pursuant to 16 TAC § 22.144(h)(3), the attachment will be available for inspection at its usual repository, SPS's offices in Austin, Texas, unless otherwise indicated. SPS requests that parties wishing to inspect this material provide at least 48-hour notice of their intent by contacting Stephanie Tanner at Coffin Renner L.L.P. PC, 1011 West 31st Street, Austin, Texas 78705; telephone number (512) 879-0900; facsimile transmission number (512) 879-0912; email address stephanie.tanner@crtxlaw.com. Inspections will be scheduled to accommodate all requests with as little inconvenience to the requesting party and to SPS's operations as possible.

Respectfully submitted,

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ATTORNEYS FOR
SOUTHWESTERN PUBLIC SERVICE COMPANY

RESPONSES

QUESTION NO. Sierra Club 1-1:

Please provide any responses to Requests for Information issued by SPS to any other party to this proceeding.

RESPONSE:

Non-Confidential and Non-Highly Sensitive Responses to Requests for Information that were issued by SPS to other parties prior to Sierra Club's intervention were transmitted electronically to Sierra Club on November 5, 2021. Confidential and Highly Sensitive Responses to Requests for Information will be transmitted to Sierra Club upon receipt of executed Protective Order Certifications. Because Sierra Club is a party to this proceeding, its representatives are included on the Certificate of Service and will continue to receive copies of all discovery responses submitted by SPS.

Preparer: Michael Knapp
Sponsor: William A. Grant

QUESTION NO. Sierra Club 1-2:

Please provide all work papers and schedules supporting SPS/Xcel's application and supporting testimony (in electronic, machine-readable format with formulae intact).

RESPONSE:

SPS provided the workpapers to the direct testimony of John M. Goodenough in electronic format with its filed Application in this case.

Please also refer to Exhibit SPS-SC 1-2 for Attachment ML-1 in electronic format.

Preparer: Jeff Comer
Sponsor: Mark Lytal, John Goodenough

QUESTION NO. Sierra Club 1-3:

Please refer to the Direct Testimony of Ben R. Elsey at page 13. Please provide all Encompass and all Strategist modeling input and output files supporting SPS/Xcel's application and supporting testimony (in electronic, machine-readable format with formulae intact).

RESPONSE:

Please refer to Exhibit SPS-SC 1-3(i)(HS)(USB) for the EnCompass input and output files.

Please refer to Exhibit SPS-SC 1-3(ii) for the Strategist output files. The structure of the Strategist input files are proprietary to the vendor and can only be provided to active licensees of the Strategist software.

Preparer: Mark Christner, Ben R. Elsey
Sponsor: Ben R. Elsey

QUESTION NO. Sierra Club 1-4

Please refer to the Direct Testimony of Ben R. Elsey at page 13-14. For the Harrington analyses, please provide all documents, analyses, or forecasts that the Company relied upon to calculate or develop costs included in the Company's modeling, including, without limitation, all:

a. Fuel costs for all electric power supply resources (owned and purchased, including all fuel contracts) and market energy costs (which are forecasted based on gas prices);
b. Purchased energy costs for all electric power supply resources;
c. Capacity costs of purchased power;
d. Variable operational and maintenance **("VOM")** costs of purchased power;
e. Capital cost forecasts for new and existing electric generation facilities, including, but not limited to, the assumed costs for converting each of the three Harrington units and assumed pipeline costs;
f. Energy costs for new and existing wind and solar generation facilities;
g. Electric transmission interconnection and network upgrade costs for new generation;
h. Fixed operation and maintenance costs for existing and new generation facilities;
i. VOM costs for existing and new generation facilities, including all maintenance schedules or maintenance plans;
j. Remaining book value of SPS-owned generating units; and

RESPONSE:

a. Please refer to Exhibit SPS-SC 1-4(a)(CONF)(USB) for the fuel costs and market energy costs used for the Harrington Analysis.

b. Please refer to the EnCompass input files provided in Exhibit SPS-SC 1-3(i)(HS)(USB) for the purchased energy costs for all existing purchased power agreements.

c. Please refer to the EnCompass input files provided in Exhibit SPS-SC 1-3(i)(HS)(USB) for the capacity costs for all existing purchased power agreements.

d. Please refer to the EnCompass input files provided in Exhibit SPS-SC 1-3(i)(HS)(USB) for the Variable operational and maintenance ("VOM") costs for existing purchased power agreements.

e. Please refer to Exhibit SPS-SC 1-4(e)(i) for the scenario specific capital cost forecasts for each of the Harrington units and assumed pipeline costs used for the Harrington analysis. Please refer to Exhibit SPS-SC 1-4(e)(ii)(CONF)(USB) for additional information supporting the cost of installing environmental controls at Harrington. Please refer to the EnCompass input files provided in Exhibit SPS-SC 1-

3(i)((HS)(USB) for the capital cost forecasts for SPS's other generating facilities. Please refer to Exhibit SPS-SC 1-4(e)(ii)((HS)(USB) for all capital cost forecasts for new generation proposals received from SPS's Request for Information which were used in the Harrington Analysis. Please refer to the EnCompass inputs provided in Exhibit SPS-SC 1-3(i)(HS)(USB) for the generic costs assumptions used for other new generating resources.

f. Please refer to the EnCompass input files provided in Exhibit SPS-SC 1-3(i)(HS)(USB) for the energy cost of all existing wind and solar generating facilities. Please refer to Exhibit SPS-SC 1-4(e)(ii)(HS)(USB) for all energy cost assumptions for new generation proposals received from SPS's Request for Information and subsequently which were used in the Harrington Analysis. Please refer to the EnCompass inputs provided in response to Question No. SPS-SC 1-3 for the generic cost assumptions used for other new generating resources.

g. Please refer to Exhibit SPS-SC 1-4(g)(CONF)(USB) for the electric transmission interconnection and network upgrade costs for new generation.

h. Please refer to Exhibit SPS-SC 1-4(e)(i) for the scenario specific fixed operational and maintenance ("FOM") forecasts for each of the Harrington units used for the Harrington Analysis. Please refer to the EnCompass input files provided in Exhibit SPS-SC 1-3(i)(HS)(USB) for the FOM forecasts for SPS's other generating facilities. Please refer to Exhibit SPS-SC 1-4(e)(ii)(HS)(USB) for all FOM forecasts for new generation proposals received from SPS's Request for Information and subsequently which were used in the Harrington Analysis. Please refer to the EnCompass inputs provided in Exhibit SPS-SC 1-3(i)(HS)(USB) for the generic cost assumptions used for other new generating resources.

i. Please refer to Exhibit SPS-SC 1-4(e)(i) for the scenario specific VOM forecasts for each of the Harrington units used for the Harrington Analysis. Please refer to the EnCompass input files provided in Exhibit SPS-SC 1-3(i)(HS)(USB) for the VOM forecasts for SPS's other generating facilities. Please refer to Exhibit SPS-SC 1-4(e)(ii)(HS)(USB) for all VOM forecasts for new generation proposals received from SPS's Request for Information and subsequently used in the Harrington Analysis. Please refer to the EnCompass inputs provided in Exhibit SPS-SC 1-3(i)(HS)(USB) for the generic costs assumptions used for other new generating resources.

j. Please refer to the EnCompass input files provided in Exhibit SPS-SC 1-3(i)(HS)(USB).

Preparer: Ashley Gibbons, Ben Elsey
Sponsor: Ben R. Elsey

QUESTION NO. Sierra Club 1-5:

For the Harrington units:

a. Please produce any unit replacement studies done by the Company.
b. Identify any transmission grid updates or changes that would be needed to allow for the retirement of any of the units.
c. Produce any analysis or assessment of the need for the continued operations of each unit.
d. Provide the remaining book value (plant balance) at the start of 2021.
e. Identify the current undepreciated book value, and the expected undepreciated book value for each year of the remaining operation life of the unit.
f. Produce any analysis or assessment of the impact that retirement of each unit would have on capacity adequacy, transmission grid stability, transmission grid support, voltage support, or transmission system reliability.

RESPONSE:

a. Please refer to Exhibit SPS-SC 1-3(i)(HS)(USB) and Exhibit SPS-SC 1-3(ii) for the unit replacement studies SPS conducted in 2021 and 2019, respectively.

b. Transmission grid updates or changes will be studied and identified by the Southwest Power Pool, pursuant to Attachment AB "Generator Retirement Process" of the Open Access Tariff. During this process, Southwest Power Pool will perform a study to identify any updates or changes, if required, within a year of filing the retirement request. Retirement requests are required to be filed with Southwest Power Pool no less than one year from the expected retirement date. SPS does not conduct this process.

c. Please refer to SPS's responses to subpart (a) and subpart (f).

d. Please refer to Exhibit SPS-SC 1-5(d).

e. Please refer to SPS's response to subpart (d).

f. Please refer to subpart (a) and Exhibit SPS-SC 1-5(f)(CONF)(USB).

Preparers: Ben R. Elsey, Jarred Cooley, Sean Young
Sponsors: Ben R. Elsey, William A. Grant

QUESTION NO. Sierra Club 1-6:

Has SPS/Xcel evaluated whether any of the Harrington units will require additional investments to comply with final, proposed, or possible future environmental regulations including, but not limited to: existing consent decrees, new source review provisions, coal combustion residuals, effluent limitation guidelines, national ambient air quality standards, cooling water intake standards, the cross-state air pollution rule, the mercury and air toxics standards, regional haze, and carbon dioxide emissions?

a. If not, please explain why not.
b. If so, please provide a summary, organized by electric generating unit, briefly describing the additional investments, including the purpose, and capital and annual O&M costs of such investments.
c. Please also include all supporting analyses, calculations, data, documents, modeling input and output files, and work papers associated with each investment.

RESPONSE:

Currently there are no other impending regulations that would be applicable to all three Harrington units other than the current SO2 National Ambient Air Quality Standards (NAAQS) requirements for which this gas conversion is being implemented. As stated in testimony by Mr. West, the current options to comply with the SO2 NAAQS standard involve the installation of SO2 controls, fuel conversion, retirement or some combination of these alternatives. The installation of SO2 controls would most likely require all three Harrington units to further comply with requirement in the Coal Combustion Residuals (CCR) rules. SPS beneficially uses 100% of its coal ash and is currently not subject to these requirements. The installation of SO2 controls would most likely render the majority if not all of the ash unusable for beneficial use and subject to these regulations.

The US Environmental Protection Agency (EPA) has also vacated the Affordable Clean Energy (ACE) rule for greenhouse gas regulations and will not be reinstating the former Clean Power Plan (CPP). It is SPS's understanding that the EPA intends to draft a new rule to replace the CPP. The contents of this rule are not known until published and cannot be evaluated until then.

There are no other known rules in any proposed or final state applicable to all three Harrington units that are not already incorporated into the operating permits for the facility. All three units are demonstrating compliance with these required operating permits.

Preparers: Jeff West
Sponsor: Jeff West

QUESTION NO. Sierra Club 1-7:

For the Harrington units, please provide the following historical annual data going back to 2015 - 2021, broken down by unit:

i. Installed Capacity
ii. Capacity factor
iii. Availability factor
iv. Heat Rate
v. Forced outage rate
vi. Fixed O&M costs
vii. Non-Fuel Variable costs
viii. Fuel Costs
ix. Environmental capital costs
x. Non-environmental capital costs
xi. Energy revenues (i.e., avoided energy purchase costs)
xii. Ancillary services revenues
xiii. Any other revenues
xiv. Depreciation
xv. Undepreciated net book value
xvi. Property taxes
xvii. Property insurance
xviii. Projected retirement date, if any.

RESPONSE:

i. Please refer to Exhibit SPS-SC 1-7(a-e). Please note that 2021 data for Harrington will not be available until after the year end.
ii. Please refer to Exhibit SPS-SC 1-7(a-e). Please note that 2021 data for Harrington will not be available until after the year end.
iii. Please refer to Exhibit SPS-SC 1-7(a-e). Please note that 2021 data for Harrington will not be available until after the year end.
iv. Please refer to Exhibit SPS-SC 1-7(a-e). Please note that 2021 data for Harrington will not be available until after the year end.
v. Please refer to Exhibit SPS-SC 1-7(a-e). Please note that 2021 data for Harrington will not be available until after the year end.
vi. Please refer to Exhibit SPS-SC 1-7(f-h). Please note that 2021 data for Harrington will not be available until after the year end.
vii. Please refer to Exhibit SPS-SC 1-7(f-h). Please note that 2021 data for Harrington will not be available until after the year end.
viii. Please refer to Exhibit SPS SC 1-7(f-h). Please note that 2021 data for Harrington will not be available until after the year end.
ix. Please refer to Exhibit SPS SC 1-7(i, j). Please note that 2021 data for Harrington will not be available until after the year end.

x. Please refer to Exhibit SPS SC 1-7(i, j). Please note that 2021 data for Harrington will not be available until after the year end.

xi. Please refer to Exhibit SPS-SC 1-7(k). Please note that 2021 data for Harrington will not be available until after the year end.

xii. Please refer to Exhibit SPS-SC 1-7(l). Please note that 2021 data for Harrington will not be available until after the year end.

xiii. Please refer to Exhibit SPS-SC 1-7(m). Exhibit represents annual coal ash revenue for Harrington. Please note, this information is not invoiced on a per unit basis.

xiv. Please refer to Exhibit SPS-SC 1-7(n).

xv. Please refer to SPS's response to subpart (n).

xvi. Please refer to Exhibit SPS-SC 1-7(p). Please note that 2021 data for Harrington will not be available until after the year end.

xvii. Xcel Energy does not allocate insurance costs to individual assets. The amount allocated to SPS is based on the replacement value of insurable SPS assets as it bears to the replacement value of insurable assets for the entire company. Amounts allocated to SPS are below:

	2016	2017	2018	2019	2020
SPS	$2,918,882	$2,774,425	$2,931,713	$3,514,302	$3,947,113

Please note that 2021 data for Harrington will not be available until after the year end.

xviii. SPS is not requesting a modification to the Commission approved retirement dates in this case. For Harrington Generating Station Units 1, 2, and 3, those dates are 2036, 2038, and 2040, respectively.

Preparers: Allison Johnson, Ryan Crotty, Sean Young, Jeff Comer
Sponsors: William A. Grant, Ben R. Elsey, Mark Lytal

QUESTION NO. Sierra Club 1-8:

For each Harrington unit, please state the Company's forward-looking assumptions for each of the following, by year 2021 through 2032. For any assumption which varies from a modeling input used in this case, please state the deviation, and explain why the Company has changed its assumption.

i. Installed Capacity
ii. Capacity factor
iii. Availability factor
iv. Heat Rate
v. Forced outage rate
vi. Fixed O&M costs
vii. Non-Fuel Variable costs
viii. Fuel Costs
ix. Environmental capital costs
x. Non-environmental capital costs
xi. Energy revenues (i.e., avoided energy purchase costs)
xii. Ancillary services revenues
xiii. Any other revenues
xiv. Depreciation
xv. Undepreciated net book value
xvi. Property taxes
xvii. Property insurance
xviii. Projected retirement date, if any.

RESPONSE:

a. Please refer to the EnCompass output files provided in Exhibit SPS-SC 1-3(i)(HS)(USB).

b. Please refer to the EnCompass output files provided in Exhibit SPS-SC 1-3(i)(HS)(USB).

c. Please refer to the EnCompass output files provided in Exhibit SPS-SC 1-3(i)(HS)(USB).

d. Please refer to the EnCompass output files provided in Exhibit SPS-SC 1-3(i)(HS)(USB).

e. Please refer to the EnCompass output files provided in Exhibit SPS-SC 1-3(i)(HS)(USB).

f. Please refer to SPS's response to Question No. SPS-SC 1-4(h).

g. Please refer to SPS's response to Question No. SPS-SC 1-4(i).

h. Please refer to the EnCompass output files provided in Exhibit SPS-SC 1-3(i)(HS)(USB).

i. Please refer to SPS's response to SPS-SC 1-4(e).

j. Please refer to SPS's response to SPS-SC 1-4(e).

k. None.

l. None.

m. Please refer to the EnCompass output files provided in Exhibit SPS-SC 1-3(i)(HS)(USB).

n. Depreciation cost is calculated using the formula: Undepreciated net book value divided by remaining asset life. Remaining asset life for Harrington Station varies by scenario. Please refer to SPS's response to subpart (o) for undepreciated net book value.

o. Please refer to the EnCompass input files provided in Exhibit SPS-SC 1-3(i)(HS)(USB).

p. SPS calculates property taxes on an aggregate, system-wide basis and then allocates this to each unit. Therefore, SPS's most recent analysis does not include plant or unit-specific forward-looking estimates for property taxes. EnCompass approximates these costs using 0.53% of the original book value plus plant additions to all generation units.

q. SPS calculates property insurance on an aggregate, system-wide basis and then allocates this to each unit. Therefore, SPS's most recent analysis does not include plant or unit-specific forward-looking estimates for property taxes. EnCompass approximates these costs using 0.038% of the original book value plus plant additions to all generation units.

r. Please refer to the EnCompass output files provided in Exhibit SPS-SC 1-3(i)(HS)(USB).

Preparers: Ben R. Elsey, Mark Christner
Sponsor: Ben R. Elsey

QUESTION NO. Sierra Club 1-9:

Please provide all load forecasts for the last 10 years that have been prepared by or for SPS/Xcel.

RESPONSE:

Please refer to Exhibit SPS-SC 1-9.

Preparer: Arslan Gohir
Sponsor: John M. Goodenough

QUESTION NO. Sierra Club 1-10:

Please refer to the Direct Testimony of Ben R. Elsey at 6-7. Indicate the date at which SPS first knew it would be in violation of NAAQS standards if it continued burning coal at Harrington beyond the end of 2024.

a. Provide all internal reports and presentations created prior to October 2020 that discuss the need to cease coal-fired operations at Harrington.
b. Provide all internal reports and presentations created prior to October 2020 that discuss alternatives to Harrington

RESPONSE:

In October of 2019, SPS internal staff began to accumulate the emissions data publicly available through the TCEQ monitor website from the monitor near Harrington station to make an initial estimate of compliance with the standard. This monitor was installed in late 2016 to accumulate data from 2017 to 2019 to determine nonattainment as required by the NAAQS. SPS staff began to calculate the 3-year average based on the emissions data and the requirements in the rule. The results of the data indicated that the monitor was potentially exceeding the standard of 75 ppb. Final calculations would be made at the end of the required monitoring period. SPS has attached the spreadsheet to calculate the 3-year average based on required NAAQS calculation methodology from 2017 to 2019.

a. Please refer to Exhibit SPS-SC 1-10(CONF)(USB).

b. Please refer to subpart a.

Preparers: Ben R. Elsey, Jeffrey L. West
Sponsors: Ben R. Elsey, Jeffrey L. West

QUESTION NO. Sierra Club 1-11:

Please refer to the Direct Testimony of Ben R. Elsey at 8. Indicate whether SPS has considered securitization of other financing options as a way to minimize rate impacts from early retirement of the Harrington units

RESPONSE:

SPS is unaware of any legal authority permitting the securitization of the undepreciated balance of the Harrington units.

Preparer: Counsel
Sponsor: William A. Grant

QUESTION NO. Sierra Club 1-12:

Please refer to the Direct Testimony of Ben R. Elsey at 9. If SPS retired one Harrington unit at the end of 2024, and converted the other two, would the Company need additional replacement resources in 2024? Please explain.

RESPONSE:

No. SPS has sufficient generating resources to meet its planning reserve margin requirements in 2024. Retiring one Harrington Unit at the end of 2024 would have no impact on SPS's capability to meet its planning reserve margin requirements in 2024. However, retiring one Harrington unit at the end of 2024 would necessitate the need for additional replacement resources in subsequent years. Please refer to SPS's financial and planning forecast tables in Exhibit SPS-SC 1-13 for SPS's capacity need, with and without, one Harrington Unit.

Preparer: Ben R. Elsey
Sponsor: Ben R. Elsey

QUESTION NO. Sierra Club 1-13:

Please refer to the Direct Testimony of Ben Elsey at 8 and 18, discussing the need for replacement capacity if Harrington is retired, rather than repowered. Please state by year, through 2040, how much replacement capacity would be needed if SPS retired Harrington Unit One in 2024, while repowering units Two and Three. Please state whether your responses to this interrogatory are consistent with the Loads and Resources Table presented in SPS's most recent IRP, and if not, what is changed.

RESPONSE:

Please refer to Exhibit SPS-SC 1-13 for SPS's capacity need from 2025 to 2040, using SPS's most recent financial and planning load forecasts. Exhibit SPS-SC 1-13 assumes Harrington Unit 1 is retired at the end of 2024 and the remaining units are converted to operate on natural gas.

SPS is not required to file an integrated resource plan in Texas.

Preparers: Ashley Gibbons, Ben R. Elsey
Sponsor: Ben R. Elsey

QUESTION NO. Sierra Club 1-14:

Please state whether, if it was deemed economical and prudent to retire one of the three Harrington units, while repowering the others, which unit would be the most appropriate to retire, and the reason(s) for that selection.

RESPONSE:

Given the remaining useful lives of the units, SPS believes the largest potential negative economic impact to customers would be to retire units 2 and 3 early. Therefore, retiring Unit 1 would be the most appropriate under the circumstances described.

Preparer: Ben R. Elsey
Sponsor: Ben R. Elsey

QUESTION NO. Sierra Club 1-15:

Please state whether, if it was deemed economical and prudent to retire two of the Harrington units, while repowering the third, which two units would be the most appropriate to retire, and the reason(s) for that selection.

RESPONSE:

Given the remaining useful life of the unit, SPS believes the largest potential negative economic impact to customers would be to retire unit 3 early. Therefore, retiring Unit 1 and Unit 2 would be the most appropriate under the circumstances described.

Preparer: Ben R. Elsey
Sponsor: Ben R. Elsey

QUESTION NO. Sierra Club 1-16:

Please refer to the Direct Testimony of Ben R. Elsey at 9. Indicate whether decommissioning costs were incorporated into SPS' s Harrington analysis. If so, explain how they were incorporated.

RESPONSE:

Yes. Decommissioning costs for all SPS owned generating units were incorporated into SPS's Harrington Analysis, with the decommissioning cost for each unit recovered over the remaining life of the unit.

Preparers: Mark Christner, Ben R. Elsey
Sponsor: Ben R. Elsey

QUESTION NO. Sierra Club 1-17:

Please refer to the Direct Testimony of Ben R. Elsey at 19 regarding SPS's ability to acquire replacement resources before Harrington has to cease coal-fired operations.

a. Explain what actions SPS has taken to evaluate the availability and cost of alternative resource options.
b. Indicate whether SPS has issued an RFP for replacement resources in the time since its agreement with TCEQ was made.
c. Has SPS discussed with TCEQ the possibility of delaying compliance by a short period of time if doing so would allow the transition to alternative resources?

RESPONSE:

a. As described on Pages 39-40 of the Direct Testimony of Ben R. Elsey, SPS issued a Request for Information to evaluate the availability and cost of alternative resource options.

b. SPS has not issued a Request for Proposals, however, as described in subpart (a), SPS has received and evaluated the results of a Request for Information since its agreement with the TCEQ was made.

c. No. Under the current agreed order SPS is required to cease coal activities at all three Harrington units by January 1, 2025. Due to the timing required for attainment designations and final State Implementation Plans (SIP) needed to demonstrate compliance with the standards, no extensions of time would be granted nor needed as the regulatory schedule could not be met for the state to demonstrate compliance. The conversion of all three units to gas was the optimal option as demonstrated in previous testimony by Mr. Elsey and complied with the regulatory timeline needed for compliance.

Preparers: Ben R. Elsey, Jeffrey L. West
Sponsors: Ben R. Elsey, Jeffrey L. West

QUESTION NO. Sierra Club 1-18:

Please refer to the Direct Testimony of Ben R. Elsey at 27-28 regarding the capital investment required for various resource options. Provide the Levelized Cost of Energy for each of the resource options listed there.

RESPONSE:

SPS has not calculated the levelized cost of energy for each of the resource options listed. Furthermore, SPS does not believe the Levelized Cost of Energy is an appropriate measure for resources such as combustion turbines or battery energy storage, which are predominately capacity resources.

Preparer: Ben R. Elsey
Sponsor: Ben R. Elsey

QUESTION NO. Sierra Club 1-19:

Please refer to the Direct testimony of D. Dean Koujak at 10. Please provide all of the referenced proposals in response to the Request for Information.

RESPONSE:

Please refer to Exhibit SPS-SC 1-4(e)(ii)(HS)(USB) for the Request for Information proposals. SPS will provide confidential material to requesting parties having executed the Confidentiality Agreement of the Protective Order.

Preparer: Ben R. Elsey
Sponsors: Ben R. Elsey, D. Dean Koujak

QUESTION NO. Sierra Club 1-20:

Please refer to the Direct testimony of D. Dean Koujak at 12, and Attachment DDK-1 at pages 9-10 of 16.

a. For Guidehouse's review of SPS's fuel price forecasts, please provide all documentation, evidence, and supporting examples relied upon for the statement, "On similar engagements, we have observed similar approaches used by other utilities."
b. For Guidehouse's review of SPS's market electricity prices, please provide all documentation, evidence, and supporting examples relied upon for the statement, "On similar engagements, we have observed similar approaches used by other utilities."
c. For Guidehouse's review of SPS's load and demand, please provide all documentation, evidence, and supporting examples relied upon for the statement, "we conclude that the load and demand forecasts are reasonable and in line with industry practice."
d. For Guidehouse's review of SPS's interconnection costs, please provide all documentation, evidence, and supporting examples relied upon for the statement that this approach is "in line with standard industry practices.

RESPONSE:

a. Use of commercially available fuel price forecasts, such as those utilized by SPS, is common industry practice. In this case, SPS leveraged multiple commercially available fuel price forecasts and averaged them to create a consensus view of the forward curve. For purposes of the statement in my written testimony and/or Independent Evaluator Report, I relied on my prior professional experience in which I have both directly observed similar approaches taken by Utilities and have reviewed documentation put out by other Utilities which have adopted this same or similar approach. A CV containing my professional experience is set forth in Exhibit SPS-SC 1-20.

b. Use of a commercially available electric market forecasts, such as those utilized by Southwestern Public Service, is common industry practice. In this case, SPS leveraged implied heat rate forecasts provided by Wood Mackenzie, S&P Global, and IHS Markit for SPP South Hub. For purposes of the statement in my written testimony and/or Independent Evaluator Report, I relied on my prior professional experience in which I have both directly observed similar approaches taken by Utilities and have reviewed documentation put out by other Utilities which have adopted this same or similar approach. My professional experience is provided in response to (a).

c. In assessing whether the load and demand forecast was in-line with industry practice, I relied upon the common elements that are core and in-line with industry practice. This includes 1) developing a forecast by distinct customer classes, and if significant enough, the individual customers, 2) is extrapolated from historical patterns, and 3) uses an appropriate probabilistic load forecasting level to ensure future system

reliability. SPS developed a forecast reflecting these elements. For purposes of the statement in my written testimony and/or Independent Evaluator Report, I also relied on my prior professional experience. My professional experience is provided in response to (a).

d. It is known in the industry that interconnection costs can vary widely and are sensitive to a number of locational and regional factors. Where there is an organized Regional Transmission Organization (RTO), Utilities defer to the RTO for such costs as the process is managed by them. For an overview of SPP's interconnection process, see https://opsportal.spp.org/documents/studies/SPP%20Three%20Stage%20Process%20Overview%202019-05-31.pdf. Accordingly, SPS utilized SPP estimates for interconnection costs. In addition to this, SPS applied a range of sensitivities to account for the potential range of factors that can ultimately lead to increased/decreased costs. Interconnection cost estimates are typically used for planning purposes in the industry. Our basis of determining that SPS' approach is reasonable is based on this industry practice (use of high-level estimates) while testing for the potential range of cost increase/decrease is prudent because a range of factors can influence the ultimate cost. For purposes of the statement in my written testimony and/or Independent Evaluator Report, I relied on my prior professional experience in which I have both directly observed similar approaches taken by Utilities and have reviewed documentation put out by other Utilities which have adopted this same or similar approach. My professional experience is provided in response to (a).

Preparer: D. Dean Koujak
Sponsor: D. Dean Koujak

QUESTION NO. Sierra Club 1-21:

Please refer to the Direct testimony of D. Dean Koujak at 12, and Attachment DDK-1 at page 14 of 16. Please provide all modeling input and output files for the referenced 36 sensitivity runs (in electronic, machine-readable format with formulae intact).

RESPONSE:

Please refer to Exhibit SC 1-3(i)(HS)(USB) for the requested information. SPS will provide confidential material to requesting parties having executed the Confidentiality Agreement of the Protective Order.

Preparer: Ben R. Elsey
Sponsors: Ben R. Elsey, D. Dean Koujak

QUESTION NO. Sierra Club 1-22:

Please refer to the Direct Testimony of Mark Lytal at 8. Please provide a detailed breakdown of cost estimates for converting each of the Harrington units to burn gas, including, but not limited to capital cost estimates for the referenced gas distribution head, burners, piping, and 20-inch diameter pipeline, and all O&M forecasts for operating and maintaining the gas pipeline.

RESPONSE:

Please refer to Exhibit SPS-SC 1-22 (CONF)(USB) for a capital breakdown. Please refer to SPS's response to Question No. SC 1-4(vi) for O&M forecasts for the gas pipeline.

Preparer: Mark Lytal
Sponsor: Mark Lytal

QUESTION NO. Sierra Club 1-23:

Please refer to the Direct Testimony of Mark Lytal at 8-10.

a. What is the capacity (in dekatherms per day) of the pipeline serving Nichols Station?
b. Please provide all documentation, analyses, and forecasts (including all forecasted operations) supporting the assertion that conversion of the Harrington units is expected to require natural gas pipeline capacity of 265,000 dekatherms per day.
c. Please confirm that the forecasted pipeline capacity of 265,000 dekatherms per day assumes full load for operation of the plant.
d. Did SPS evaluate the pipeline capacity needs for different operational loads at Harrington? If yes, please provide all documentation. If not, why not?

RESPONSE:

a. The capacity of the pipeline serving Nichols Station is 114,000 dekatherms per day.

b. The capacity of the pipeline was sized for maintaining the full capacity of the Harrington units. That capacity was calculated internally by Xcel Energy – Public Service Company of Colorado Gas Engineering. Please refer to Exhibit SPS-SC 1-23.

c. Confirmed.

d. No. Please refer to part (b).

Preparer: Mark Lytal
Sponsor: Mark Lytal

QUESTION NO. Sierra Club 1-24:

Please refer to the Direct Testimony of Mark Lytal at 10. Please provide

a. All forecasts of O&M expenses associated with operating and maintaining the proposed natural gas pipeline
b. All forecasted O&M costs associated with the coal and ash systems for which costs will no longer be incurred.
c. All ongoing capital expenses associated with coal preparation, coal transport and combustion, and ash handling will no longer be incurred following the conversion.

RESPONSE:

a. Please refer to SPS's response to Question No. SC 1-4(e).

b. There are no planned O&M expenses associated with coal and ash systems once coal operations have ceased.

c. There are no planned capital expenses associated with these systems after conversion.

Preparer: Mark Lytal
Sponsor: Mark Lytal

QUESTION NO. Sierra Club 1-25:

Please refer to the Direct Testimony of Mark Lytal at 11.

a. Please explain, in detail, why the conversion of two units at Harrington would still require SPS to build a 20" natural gas pipeline to the facility. Please provide all documentation, analyses, forecasts, and studies supporting that statement.
b. Please explain why "SPS has not conducted detailed analysis to determine what cost savings" could be achieved with the conversion of only one Harrington unit.
c. Please provide the referenced "Indicative numbers for a smaller pipeline were developed and used in evaluations for a single unit conversion."

RESPONSE:

a. The next smallest gas pipeline size practical for the facility would be a 16" diameter pipe. Xcel Energy – Public Service Company of Colorado's Gas Engineering provided the basic calculation stating that a 16" diameter pipe would not provide enough pressure at Harrington for two unit operation.

b. As described in the Direct Testimony of Mr. Elsey, SPS has conducted detailed analysis to determine what cost savings (if any) could be achieved with the conversion of only one Harrington Unit to operate on natural gas. In the referenced section of Mr. Lytal's testimony, Mr. Lytal stated the company had not conducted a detailed analysis (i.e., estimate) to determine what cost savings could be achieved if a smaller gas pipeline was installed. As Mr. Lytal goes on to describe 'indicative numbers for a smaller pipeline were developed and used in evaluation for a single unit conversion.

c. Please refer to SPS's response to Question No. SC 1-4(vi).

Preparer: Mark Lytal
Sponsor: Mark Lytal

QUESTION NO. Sierra Club 1-26:

Please refer to the Direct Testimony of Mark Lytal at 16, stating that the "conversion will allow the Harrington units to be operated very similar to how the existing SPS natural gas-fired thermal steam units are currently operated and there may be opportunities to run the Harrington units at lower generation levels after the conversion, which would yield more dispatch flexibility to energy markets and reliability needs of the Bulk Electric System."

a. Would the conversion of one or two Harrington units yield similar "dispatch flexibility"? Please explain.
b. Did SPS conduct any reliability analysis, including but, not limited to, load flow analyses indicating that the Harrington units are required to maintain system reliability? If so, please provide.

RESPONSE:

a. No. Station flexibility would be reduced since the amount of dispatchable generation and reactive capabilities would be reduced by approximately one-third for each unit not converted.

b. Please refer to SPS's response to Question No. SC 1-5(b).

Preparers: Mark Lytal, Jarred Cooley
Sponsors: Mark Lytal, William A. Grant

QUESTION NO. Sierra Club 1-27:

Please refer to the Direct Testimony of Mark Lytal at 18. Please provide a detailed breakdown and all documents, analyses, or forecasts that the Company relied upon to calculate or develop all estimated Harrington conversion costs, including, but not limited to:

a. Development
b. Land Rights
c. Materials and Supplies;
d. Construction.
e. Overhead; and
f. Contingency.

RESPONSE:

At this point, cost associated with this project are estimates. Estimates come from several sources such as the pipeline Front End Engineering Design performed by a third party engineering firm and internal engineering estimates for plant engineering. Please refer to Exhibits SPS-SC 1-27.1 and SPS-SC 1-27.2.

Preparer: Mark Lytal
Sponsor: Mark Lytal

QUESTION NO. Sierra Club 1-28:

Please refer to the Direct Testimony of William Grant at -14-15 regarding the need for replacement resources to provide voltage stability to support renewables on the system.

a. Explain what resource and technology options, in combination or individually, SPS has considered that can provide the voltage stability support, and any other grid services necessary, if all or part of Harrington retired.
b. Provide the lead-time and construction time required to procure and build all alternative resources considered by SPS.
c. Indicate whether the Company has issued an RFP in the past year, or otherwise solicited bids and pricing information, on resources that could replace all or part of Harrington.
d. If yes, provide all documents which summarize the results of all such solicitations.
e. If no, explain the basis of the statement that it's not clear that SPS would be able to secure those replacement resources prior to January 1, 2025.
f. Detail all actions the Company has taken to evaluate and secure resources and technologies that could replace all or part of Harrington.
g. Provide all analysis supporting the statement that SPS might be forced to take a high cost replacement resource if it needs to replace Harrington.

RESPONSE:

a. SPS's Harrington Analysis incorporates the option for new combustion turbines generators, combined cycle generation, utility-scale battery energy storage, and the conversion of retiring units to synchronous condensers. As described in SPS-SC 1-5(b) Southwest Power Pool will identify any transmission system needs in the event one or more Harrington units is retired. SPS will re-evaluate the resource and technology options at that time.

b. Generally, SPS plan 2-3 years for procuring long lead-time equipment and to construct a new wind generating facility, solar generating facility, utility-scale battery energy storage, or new combustion turbine(s). This schedule is extended by approximately 1 year for a new combined cycle. Actual lead time will vary by project and other external factors such as supply chain availability, permitting, and project location.

   The above timeline does not include obtaining a new generator interconnection agreement from Southwest Power Pool, which as Mr. Elsey describes in his Direct Testimony is currently a multi-year process, or any potential regulatory approvals and requirements (for example, a competitive procurement process).

c. Please refer to SPS's response to Question No. SC 1-17.

d. Please refer to SPS's response to Question No. SC 1-4.

e. Not applicable.

f. Please refer to SPS's response to Question No. SC 1-17.

g. SPS does not have any analysis supporting this statement.

Preparer: Ben R. Elsey
Sponsors: Ben R. Elsey, William A. Grant

QUESTION NO. Sierra Club 1-29:

Refer to the direct testimony of Ben Elsey at 29-30. Provide the base, high, and low gas price forecasts used by SPS in the Harrington analysis.

a. Please explain the basis of the high and low gas price assumptions in detail.
b. How do current gas prices compare to the prices SPS used for the Harrington analysis?

RESPONSE:

Please refer to EnCompass input files provided in Exhibit SPS-SC 1-3(i)(HS) for the base, high and low gas price forecasts used by SPS in the Harrington analysis.

a. SPS uses a combination of market prices and fundamental price forecasts, based on multiple highly respected, industry leading sources, to calculate monthly delivered gas prices. As the foundation of the gas price forecast, Henry Hub natural gas prices are developed using a blend of market information (New York Mercantile Exchange ("NYMEX") futures prices) and long-term fundamentally based forecasts from Wood Mackenzie, IHS Energy, and S&P Global. The forecast is fully market-based for the current year plus two additional years and then transitions into blending the four sources to develop a composite forecast. The Henry Hub forecast is adjusted for regional basis differentials and specific delivery costs for each generating unit to develop final model inputs.

   SPS conducted low and high natural gas price forecast sensitivity analyses. For the low and high natural gas price cases, the base gas forecast for Henry Hub was adjusted down by 50% of the growth (escalation) in the base gas case to represent the low gas case, and adjusted up by 150% of the growth in the base gas to represent the high gas case.[1]

b. SPS has not finalized its 2H21 updated natural gas price forecast. However, preliminary analysis and review shows a relatively sharp, short-term increase in natural gas prices in 2022 and, to a lesser extent in 2023. This is in keeping with the recent historical increase in natural gas prices.

   However, SPS's long-term fundamental gas prices shows natural gas prices returning to similar prices used for the Harrington Analysis in the 2024 – 2025 timeframe and beyond. As the Harrington units will not be converted to operate on natural gas until the end of 2024, SPS do not expect the recent, short-term increase in natural gas prices to fundamentally change the analysis.

[1] Direct Testimony of Ben R. Elsey at 30:3-6.

Preparer: Ben R. Elsey
Sponsor: Ben R. Elsey

QUESTION NO. Sierra Club 1-30:

Refer to the direct testimony of Ben Elsey at 29-30. Provide each of the referenced base, high, and low market energy price forecasts used by SPS in the Harrington analysis.

a. Please explain in detail how SPS developed the forecasts.
b. How do current market energy prices compare to the prices SPS used for the Harrington analysis?

RESPONSE:

Please refer to EnCompass input files provided in Exhibit SPS-SC 1-3(i) (HS)(USB) for the base, high and low market energy price forecasts used by SPS in the Harrington analysis.

a. Please see page 15 of Mr. Elsey's Direct Testimony in which he explains that, to derive the forecast of monthly On and Off-peak electricity prices, the company uses a simple average of long-term implied heat rate forecasts provided by Wood Mackenzie, IHS Energy and S&P Global. The implied heat rates, denominated in MMBtu/MWh, are then multiplied by the company's long-term natural gas price forecast at a near location to determine the On and Off-peak energy prices.

b. As described on page 15 of Mr. Elsey's Direct Testimony, SPS's market energy price forecast is derived from multiplying the market implied heat rates by the company's long-term natural gas price forecast. In other words, market energy price forecasts will rise and fall with the natural gas price forecast. Similar to SPS's response to SPS-SC 1-29(b) market energy prices are currently higher than used by SPS in the Harrington analysis, but prices are expected to fall in the 2024 – 2025 timeframe.

Preparer: Ben R. Elsey
Sponsor: Ben R. Elsey

QUESTION NO. Sierra Club 1-31:

Refer to the direct testimony of Ben Elsey at 29-30.

a. Provide each of the referenced base, high, and low load forecasts used by SPS in the Harrington analysis.

b. Explain the basis of the load forecasts

RESPONSE:

a. To clarify, as referenced on page 29 of the Direct Testimony of Ben R. Elsey, SPS conducted sensitivities using a financial and planning load forecast, not a base, high and low load forecast. Please refer to EnCompass input files provided in Exhibit SPS-SC 1-3(i)(HS)(USB) for the financial and planning load forecasts used by SPS in the Harrington analysis.

b. The financial forecast is based on the median economic forecast provided by IHS Markit and 30-year average weather. The planning forecast is based on a Monte Carlo simulation that selects the 85th percentile of possible economic and weather outcomes.

Preparers: Ben R. Elsey, John M. Goodenough
Sponsors: Ben R. Elsey, John M. Goodenough

QUESTION NO. Sierra Club 1-32:

Refer to the direct testimony of Ben Elsey at 29-30.

a. Please explain in detail how SPS developed the different assumptions for the cost of transmission network upgrades.

b. Please provide all documentation and analyses supporting SPS's transmission network upgrade assumptions.

RESPONSE:

a. SPS first evaluated the transmission network upgrade costs assigned to Group 6 (South Texas Panhandle / New Mexico) in Southwest Power Pool's 2017-01 Phase 1 Definitive Interconnection System Impact Study. As described on page 42 of the Direct Testimony of Ben Elsey, new resources in the study were assigned, on average, $934/kW for transmission network upgrade costs. Without knowing exactly how much transmission network upgrade costs each project would eventually be assigned, SPS conducted different sensitivity analyses at $200/kW increments (i.e. $200/kW, $400/kW and $600/kW).

b. Please refer to the response to Staff 3-8.

Preparer: Ben R. Elsey
Sponsor: Ben R. Elsey

QUESTION NO. Sierra Club 1-33:

Refer to the direct testimony of Ben Elsey at 39-40. Indicate whether SPS evaluated any scenarios where tax credits for renewables were assumed to extend beyond 2025.

a. If yes, provide the results.

b. If no, explain why no such analysis was conducted, given the uncertainty on whether tax credits will be extended.

RESPONSE:

SPS did not evaluate any scenarios where tax credits for renewables were assumed to extend beyond 2025.

a. Not applicable.

b. SPS did not conduct such an analysis as: (1) it is uncertain whether tax credits will be extended beyond 2025, and (2) the specific details of any such extension to federal tax credits are not known.

Although SPS did not evaluate a scenario where tax credits were extended beyond 2025, SPS allowed the EnCompass model to add a significant and infeasible amount of new renewable generation (based on economics) before the end of 2025, therefore qualifying for existing federal tax credits.

Preparer: Ben R. Elsey
Sponsor: Ben R. Elsey

QUESTION NO. Sierra Club 1-34:

Refer to the direct testimony of Ben Elsey at 33-34.

a. Please provide all analyses and workpapers (in native format, with formulae intact) for the Company's assertion that customers will incur "$168M of additional costs between now and the end of 2024, on a PVRR basis, if all three Harrington Units are retired ...."

b. Did the Company evaluate the cost of accelerated depreciation for customers if just one or two Harrington Units are retired? If so, please provide all supporting analysis. If not, why not?

RESPONSE:

a. Please refer to the EnCompass output files provided in Exhibit SPS-SC 1-3(i)(HS)(CONF), specifically the Scenario in which all three units are retired by end of year 2024.

b. Yes. Please refer to the EnCompass output files provided in Exhibit SPS-SC 1-3(i)(HS)(CONF), specifically the Scenarios in which either one or two units are retired by end of year 2024.

Preparer: Ben R. Elsey
Sponsor: Ben R. Elsey

QUESTION NO. Sierra Club 1-35:

Refer to the direct testimony of Ben Elsey at 34.

a. Please explain why customers will incur "$39M higher costs between now and 2025, on a PVRR basis, if Harrington Unit I is retired."
b. Please provide all analyses and workpapers (in native format, with formulae intact) for that assertion.

RESPONSE:

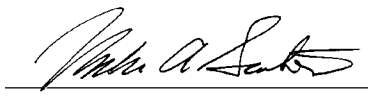
a. The additional costs associated with retiring Harrington Unit 1 at the end of 2024, twelve years ahead of currently scheduled, is largely caused by the acceleration of depreciation expense and decommissioning costs.

b. Please refer to the EnCompass output files provided in response to Exhibit SPS-SC 1-3(i)(HS)(USB).

Preparer: Ben R. Elsey
Sponsor: Ben R. Elsey

CERTIFICATE OF SERVICE

I certify that on the 10th day of November 2021, a true and correct copy of the foregoing instrument was served on all parties of record by electronic service and by either hand-delivery, Federal Express, regular first-class mail, certified mail, or facsimile transmission.



Mark Santos

Unit	Asset Classification	Propsoed Retirement Year (c)	1/1/2021	1/1/2021	1/1/2022	1/1/2023	1/1/2024	1/1/2025	1/1/2026	1/1/2027	1/1/2028	1/1/2029
Harrington Unit 1	Coal	2024	$ 22,536,171	8,813,183	8,114,555	7,415,928	6,717,301					
Harrington Unit 2	Coal	2024	21,549,344	9,016,256	8,389,897	7,763,538	7,137,178					
Harrington Unit 3	Coal	2024	21,720,678	8,556,063	7,983,240	7,410,417	6,837,594					
Harrington Common	Coal	2024	7,897,767	3,365,490	3,010,570	2,655,650	2,300,730					
Harrington Unit 1	Gas	2036	145,963,109	60,639,832	56,099,555	51,559,278	47,019,001	42,478,724	37,938,447	33,398,170	28,857,892	24,317,615
Harrington Unit 2	Gas	2038	163,571,000	73,998,083	69,457,806	64,917,529	60,377,252	55,836,974	51,296,697	46,756,420	42,216,143	37,675,866
Harrington Unit 3	Gas	2040	169,361,133	73,240,001	68,801,789	64,363,577	59,925,366	55,487,154	51,048,942	46,610,730	42,172,518	37,734,306
Harrington Common	Gas	2040	41,809,209	10,423,757	8,616,427	6,809,097	5,001,766	3,194,436	1,387,106	(420,224)	(2,227,555)	(4,034,885)

(a) Undepreciated Net Book Value excludes Land Owned (non-depreciable)
(b) Negative undepreciated Net Book Values represent instances where the plant investment depreciation reserve plus the cost of removal reserve exceeds the historical cost of the plant investment.
(c) SPS has assumed that a year after the proposed retirement year that the plant will be retired and dismantling activities will conclude, resulting in a zero undepreciated Net Book Value.

Unit	Asset Classification	Propsoed Retirement Year (c)	1/1/2030	1/1/2031	1/1/2032	1/1/2033	1/1/2034	1/1/2035	1/1/2036	1/1/2037	1/1/2038	1/1/2039
Harrington Unit 1	Coal	2024										
Harrington Unit 2	Coal	2024										
Harrington Unit 3	Coal	2024										
Harrington Common	Coal	2024										
Harrington Unit 1	Gas	2036	19,777,338	15,237,061	10,696,784	6,156,507	1,616,230	(2,924,047)	(7,464,324)			
Harrington Unit 2	Gas	2038	33,135,589	28,595,312	24,055,035	19,514,758	14,974,480	10,434,203	5,893,926	5,893,926	5,893,926	
Harrington Unit 3	Gas	2040	33,296,095	28,857,883	24,419,671	19,981,459	15,543,247	11,105,035	6,666,824	6,666,824	6,666,824	6,666,824
Harrington Common	Gas	2040	(5,842,215)	(7,649,546)	(9,456,876)	(11,264,206)	(13,071,536)	(14,878,867)	(16,686,197)	(18,493,527)	(20,300,858)	(22,108,188)

(a) Undepreciated Net Book Value excludes Land Owned (non-depre
(b) Negative undepreciated Net Book Values represent instances wh
(c) SPS has assumed that a year after the proposed retirement year

Unit	Asset Classification	Propsoed Retirement Year (c)	1/1/2040
Harrington Unit 1	Coal	2024	
Harrington Unit 2	Coal	2024	
Harrington Unit 3	Coal	2024	
Harrington Common	Coal	2024	
Harrington Unit 1	Gas	2036	
Harrington Unit 2	Gas	2038	
Harrington Unit 3	Gas	2040	6,666,824
Harrington Common	Gas	2040	(23,915,518)

(a) Undepreciated Net Book Value excludes Land Owned (non-depre
(b) Negative undepreciated Net Book Values represent instances wh
(c) SPS has assumed that a year after the proposed retirement year

Harrington Unit 1	(a) Installed Capacity	(b) Capacity Factor net	(c) Equivalent Availability Factor	(d) Heat Rate net	(e) Force Outage Rate
2015	343	67.58	92.64	10,639.27	4.14
2016	343	49.39	80.83	10,754.36	3.15
2017	343	43.31	95.45	10,897.11	1.60
2018	343	46.17	88.67	10,828.92	6.61
2019	343	30.25	68.51	11,304.09	8.47
2020	343	33.87	86.49	11,442.36	10.98

Harrington Unit 2	(a) Installed Capacity	(b) Capacity Factor net	(c) Equivalent Availability Factor	(d) Heat Rate net	(e) Force Outage Rate
2015	343	68.51	93.02	10,574.80	3.40
2016	343	59.43	88.77	10,756.70	3.67
2017	343	56.67	85.75	10,598.64	1.25
2018	343	67.19	96.35	10,476.19	1.56
2019	343	45.12	89.41	10,868.70	8.80
2020	343	36.08	74.38	11,063.14	0.47

Harrington Unit 3	(a) Installed Capacity	(b) Capacity Factor net	(c) Equivalent Availability Factor	(d) Heat Rate net	(e) Force Outage Rate
2015	347	58.05	75.13	10,614.18	0.24
2016	347	60.45	90.80	10,636.43	2.31
2017	347	55.64	94.64	10,519.47	1.60
2018	347	47.58	76.42	10,546.37	9.70
2019	347	50.18	88.68	10,630.98	3.75
2020	347	42.26	87.39	10,746.47	4.87

Installed Capacity comes from the turbine nameplate

Fixed O&M Costs	2014	2015	2016	2017	2018	2019	2020
Harrington	$ 22,676,231	$ 29,613,830	$ 21,458,696	$ 30,681,095	$ 19,182,149	$ 19,424,497	$ 16,032,485

Variable Costs	2014	2015	2016	2017	2018	2019	2020
Harrington	$ 14,721,052	$ 7,248,875	$ 8,790,904	$ 6,656,593	$ 7,459,296	$ 6,425,988	$ 6,478,307

Fuel Costs	2014	2015	2016	2017	2018	2019	2020
Harrington	$ 117,037,218	$ 123,243,181	$ 111,705,909	$ 105,901,305	$ 92,722,544	$ 82,562,995	$ 76,275,293

Category	Unit	Sum of 2015	Sum of 2016	Sum of 2017	Sum of 2018	Sum of 2019	Sum of 2020	Total by Unit / Category
Environmental	0	$ 227,257	$ 2,319	$ -	$ -	$ 208,301	$ -	$ 437,877
	1	$ 262,847	$ 2,387,532	$ 469,327	$ 149,949	$ 327,957	$ 121,036	$ 3,718,647
	2	$ 240,333	$ 188,539	$ 82,427	$ 223,905	$ 12,969	$ (24)	$ 748,149
	3	$ 1,027,360	$ 5,161	$ 14	$ 666,208	$ -	$ 7,579	$ 1,706,322
Environmental Total		$ 1,757,797	$ 2,583,551	$ 551,767	$ 1,040,062	$ 549,227	$ 128,591	$ 6,610,995
Non-Environmental	0	$ 3,088,562	$ 2,568,492	$ 1,987,030	$ 464,086	$ 1,554,819	$ 2,804,956	$ 12,467,945
	1	$ 3,398,946	$ 2,711,367	$ 2,958,808	$ 1,683,589	$ 3,477,608	$ 4,534,648	$ 18,764,966
	2	$ 9,363,520	$ 6,778,674	$ 853,748	$ 6,308,090	$ 703,429	$ 2,795,541	$ 26,803,001
	3	$ 10,904,775	$ 8,201,917	$ 10,164,517	$ 3,682,263	$ 5,423,188	$ 1,632,788	$ 40,009,448
Non-Environmental Total		$ 26,755,803	$ 20,260,451	$ 15,964,104	$ 12,138,027	$ 11,159,044	$ 11,767,933	$ 98,045,361
Grand Total		$ 28,513,600	$ 22,844,003	$ 16,515,871	$ 13,178,089	$ 11,708,271	$ 11,896,524	$ 104,656,356

Sierra Club RFI
Request 1-7, sub part (K): Energy Market Revenues

	2015	2016	2017	2018	2019	2020	2021 YTD[1]
Harrington: Generator No. 1	41,361,831	25,447,550	26,354,461	34,796,843	20,988,370	23,179,959	137,413,548
Harrington: Generator No. 2	42,246,294	32,985,086	31,922,331	47,496,580	32,061,259	24,218,392	147,839,450
Harrington: Generator No. 3	37,531,868	32,663,469	33,044,424	33,293,774	34,284,631	27,357,585	157,396,819
Harrington Plant	121,139,993	91,096,105	91,321,216	115,587,198	87,334,260	74,755,936	442,649,817

Notes
(1) - The 2021 YTD values include energy revenues received for operating days Jan 1, 2021 - September 30, 2021. YTD energy revenues had not been finalized by the Southwest Power Pool and are subject to re-settlement.

Sierra Club RFI
Request 1-7, sub part (L): Ancillary Market Revenues

	2015	2016	2017	2018	2019	2020	2021 YTD[1]
Harrington: Generator No. 1	664,053	690,456	612,114	603,062	734,863	950,617	901,304
Harrington: Generator No. 2	1,102,085	1,377,951	1,393,204	1,581,849	1,418,016	1,079,612	1,174,322
Harrington: Generator No. 3	679,500	1,220,151	1,234,813	825,836	1,369,622	1,539,365	1,454,744
Harrington Plant	2,445,638	3,288,557	3,240,132	3,010,747	3,522,501	3,569,593	3,530,370

Notes
(1) - The 2021 YTD values include energy revenues received for operating days Jan 1, 2021 - September 30, 2021. YTD energy revenues had not been finalized by the Southwest Power Pool and are subject to re-settlement.

Year	Total Annual Revenue	
2015	$ 1,390,351.74	
2016	$ 1,419,967.12	
2017	$ 1,333,772.47	
2018	$ 1,226,864.04	
2019	$ 1,204,555.57	
2020	$ 564,273.72	
2021	$ 476,373.53	*YTD as of 8/31/2021*

SC 1-7n - Depreciation

Unit	As of : 12/31/2015	12/31/2016	12/31/2017	12/31/2018	12/31/2019	12/31/2020	6/30/2021
Harrington Common	$ 1,037,111	$ 1,070,952	$ 1,093,549	$ 1,103,644	$ 1,130,016	$ 1,732,058	$ 903,665
Harrington Unit 1	3,214,701	3,339,024	3,527,941	3,513,054	3,583,446	4,545,936	2,270,139
Harrington Unit 2	3,283,984	3,389,395	3,563,851	3,621,987	3,618,198	4,730,527	2,454,133
Harrington Unit 3	3,274,992	3,424,056	3,414,092	3,429,929	3,616,604	4,401,310	2,219,106
Harrington Common - Coal	-	-	-	-	-	-	177,460
Harrington Unit 1 - Coal	-	-	-	-	-	-	349,314
Harrington Unit 2 - Coal	-	-	-	-	-	-	313,180
Harrington Unit 3 - Coal	-	-	-	-	-	-	286,411
Total	**10,810,787**	**11,223,426**	**11,599,433**	**11,668,614**	**11,948,264**	**15,409,831**	**8,973,407**

SC 1-7o - Undepreciation Net Book Value (a)

Unit	As of : 12/31/2015	12/31/2016	12/31/2017	12/31/2018	12/31/2019	12/31/2020	6/30/2021
Harrington Common	24,259,646	24,770,137	24,734,514	23,929,376	27,280,194	10,423,757	9,661,972
Harrington Unit 1	64,073,446	75,113,651	76,262,615	72,088,884	68,452,041	60,639,832	58,732,717
Harrington Unit 2	72,839,066	75,798,513	84,399,420	80,928,565	74,995,763	73,998,083	72,470,578
Harrington Unit 3	71,354,373	68,689,605	66,462,954	70,930,529	72,292,897	73,240,001	71,166,452
Harrington Common - Coal	-	-	-	-	-	3,365,490	3,135,708
Harrington Unit 1 - Coal	-	-	-	-	-	8,813,183	8,496,149
Harrington Unit 2 - Coal	-	-	-	-	-	9,016,256	8,396,578
Harrington Unit 3 - Coal	-	-	-	-	-	8,556,063	8,243,614
Total	**232,526,532**	**244,371,906**	**251,859,502**	**247,877,354**	**243,020,894**	**248,052,665**	**240,303,767**

(a) Undepreciated Net Book Value excludes Land Owned (non-depreciable)

Tax Year	Property Tax Location	Apportioned Tax
2016 Tax Year	Elec Prod-Steam-TX-Harrington #1	$ 863,600.00
2016 Tax Year	Elec Prod-Steam-TX-Harrington #2	898,600.00
2016 Tax Year	Elec Prod-Steam-TX-Harrington #3	1,018,300.00
2016 Tax Year	Elec Prod-Steam-TX-Harrington Cm	290,700.00
2017 Tax Year	Elec Prod-Steam-TX-Harrington #1	899,900.00
2017 Tax Year	Elec Prod-Steam-TX-Harrington #2	911,600.00
2017 Tax Year	Elec Prod-Steam-TX-Harrington #3	976,100.00
2017 Tax Year	Elec Prod-Steam-TX-Harrington Cm	285,800.00
2018 Tax Year	Elec Prod-Steam-TX-Harrington #1	978,200.00
2018 Tax Year	Elec Prod-Steam-TX-Harrington #2	1,038,200.00
2018 Tax Year	Elec Prod-Steam-TX-Harrington #3	1,075,900.00
2018 Tax Year	Elec Prod-Steam-TX-Harrington Cm	470,200.00
2019 Tax Year	Elec Prod-Steam-TX-Harrington #1	839,700.00
2019 Tax Year	Elec Prod-Steam-TX-Harrington #2	874,500.00
2019 Tax Year	Elec Prod-Steam-TX-Harrington #3	968,000.00
2019 Tax Year	Elec Prod-Steam-TX-Harrington Cm	403,500.00
2020 Tax Year	Elec Prod-Steam-TX-Harrington #1	952,500.00
2020 Tax Year	Elec Prod-Steam-TX-Harrington #2	992,200.00
2020 Tax Year	Elec Prod-Steam-TX-Harrington #3	1,095,600.00
2020 Tax Year	Elec Prod-Steam-TX-Harrington Cm	315,900.00
Total		**$ 16,149,000.00**

Tax Year	Property Tax Location	Apportioned Tax
2016 Tax Year	Elec Prod-Steam-TX-Tolk #1	$ 1,994,400.00
2016 Tax Year	Elec Prod-Steam-TX-Tolk #2	2,169,200.00
2016 Tax Year	Elec Prod-Steam-TX-Tolk Cm	557,800.00
2017 Tax Year	Elec Prod-Steam-TX-Tolk #1	2,100,000.00
2017 Tax Year	Elec Prod-Steam-TX-Tolk #2	2,311,400.00
2017 Tax Year	Elec Prod-Steam-TX-Tolk Cm	583,200.00
2018 Tax Year	Elec Prod-Steam-TX-Tolk #1	2,160,800.00
2018 Tax Year	Elec Prod-Steam-TX-Tolk #2	2,383,300.00
2018 Tax Year	Elec Prod-Steam-TX-Tolk Cm	719,300.00
2019 Tax Year	Elec Prod-Steam-TX-Tolk #1	2,232,200.00
2019 Tax Year	Elec Prod-Steam-TX-Tolk #2	2,449,700.00
2019 Tax Year	Elec Prod-Steam-TX-Tolk Cm	745,700.00
2020 Tax Year	Elec Prod-Steam-TX-Tolk #1	2,424,900.00
2020 Tax Year	Elec Prod-Steam-TX-Tolk #2	2,450,000.00
2020 Tax Year	Elec Prod-Steam-TX-Tolk Cm	691,900.00
Total		**$ 43,534,300.00**

Year	2011 Forecast		2012 Forecast		2013 Forecast		2014 Forecast		2015 Forecast	
	Energy Sales	Peak Demand	Energy Sales	Peak Demand	Energy Sales	Peak Demand	Energy Sales	Peak Demand	Energy Sales	Peak Demand
2011	29,122,592	5,069								
2012	29,725,016	5,101	27,119,043	5,097						
2013	30,385,405	5,211	27,858,673	5,242	25,980,793	5,103				
2014	30,007,255	5,158	27,489,615	5,195	26,133,067	5,102	26,551,737	5,082		
2015	29,684,667	5,018	27,572,492	5,082	26,445,390	4,998	27,230,077	4,999	26,427,304	4,900
2016	29,581,785	5,121	27,870,162	5,165	26,896,720	5,077	28,615,618	5,193	27,625,990	5,112
2017	29,303,277	5,026	27,839,236	5,066	26,926,415	4,980	29,717,556	5,233	28,461,462	5,117
2018	29,247,757	5,111	28,040,986	5,147	27,178,009	5,053	30,356,770	5,380	29,449,328	5,314
2019	27,467,309	4,504	26,761,159	4,533	25,955,231	4,406	29,089,975	4,788	28,863,017	4,775
2020	26,754,428	4,588	26,424,081	4,617	25,612,312	4,485	28,919,664	4,915	29,052,980	4,904
2021	26,957,635	4,676	26,594,524	4,698	25,770,030	4,562	29,472,961	5,040	29,610,359	5,039
2022	25,793,823	4,321	25,504,022	4,345	24,890,763	4,257	29,511,810	4,869	29,390,961	4,831
2023	25,269,466	4,405	25,089,270	4,420	24,597,987	4,329	29,614,602	4,985	29,608,294	4,950
2024	25,398,420	4,440	25,200,849	4,445	24,695,415	4,353	30,080,658	5,054	30,103,991	5,022
2025	25,565,017	4,525	25,346,509	4,522	24,821,536	4,426	30,593,245	5,174	30,549,551	5,140
2026	25,417,235	4,513	25,186,303	4,502	24,647,192	4,408	30,799,132	5,198	30,683,431	5,156
2027	25,419,775	4,601	25,182,181	4,583	24,631,203	4,485	31,166,085	5,324	31,000,873	5,275
2028	25,811,120	4,693	25,582,152	4,668	25,018,863	4,566	31,925,359	5,457	31,789,852	5,402
2029	26,164,388	4,784	25,926,306	4,752	25,359,309	4,646	32,655,755	5,586	32,472,474	5,529
2030	26,559,542	4,879	26,319,598	4,839	25,741,827	4,730	33,410,462	5,718	33,176,876	5,653
2031	26,948,959	4,976	26,705,109	4,929	26,114,954	4,815	34,172,146	5,851	33,927,853	5,784
2032		5,076	27,114,905	5,021	26,520,982	4,903	34,961,908	5,987	34,710,034	5,915
2033		5,175	27,470,784	5,111	26,880,940	4,989	35,731,841	6,123	35,364,852	6,039
2034		5,280	27,874,354	5,204	27,280,290	5,079	36,533,754	6,263	36,139,427	6,171
2035		5,387	28,293,795	5,302	27,690,404	5,172	37,347,020	6,406	36,953,702	6,309
2036		5,499	28,754,700	5,404	28,141,194	5,268	38,181,920	6,551	37,800,810	6,450
2037		5,610	29,172,426	5,505	28,547,702	5,364	38,987,529	6,696	38,514,790	6,585
2038		5,725	29,621,117	5,610	28,980,851	5,463	39,819,367	6,843	39,304,722	6,724
2039		5,841	30,069,951	5,716	29,411,737	5,563	40,655,322	6,995	40,107,044	6,865
2040		5,961	30,613,116	5,826	29,875,065	5,663	41,579,080	7,152	41,006,009	7,011
2041			31,011,789	5,937	30,256,445	5,764	42,370,087	7,304	41,747,243	7,155
2042					30,727,577	5,870	43,244,304	7,460	42,562,231	7,301
2043							44,129,488	7,619	43,396,165	7,450
2044									44,323,834	7,603
2045										
2046										
2047										
2048										
2049										

Year	2016 Forecast		2017 Forecast		2018 Forecast		2019 Forecast		2020 Forecast	
	Energy Sales	Peak Demand	Energy Sales	Peak Demand	Energy Sales	Peak Demand	Energy Sales	Peak Demand	Energy Sales	Peak Demand
2011										
2012										
2013										
2014										
2015										
2016	25,086,582	4,840								
2017	25,616,814	4,615	24,360,669	4,397						
2018	26,451,463	4,790	24,336,110	4,445	24,359,880	4,357				
2019	26,254,216	4,440	23,712,509	4,006	23,681,251	3,938	24,775,920	4,111		
2020	26,347,887	4,526	23,555,481	4,059	23,471,893	3,976	24,732,062	4,118	23,173,047	4,014
2021	26,711,482	4,615	23,740,163	4,103	23,258,852	3,929	24,856,425	4,153	23,576,292	4,044
2022	26,402,946	4,395	23,446,857	3,911	23,072,493	3,840	24,770,541	4,046	25,027,913	4,079
2023	26,506,085	4,466	23,495,649	3,951	23,066,603	3,856	24,802,764	4,077	25,231,008	4,124
2024	26,676,336	4,485	23,517,007	3,947	23,001,267	3,823	24,829,456	4,052	25,512,047	4,141
2025	26,817,896	4,554	23,584,411	3,983	22,901,778	3,835	24,770,171	4,070	25,618,113	4,172
2026	26,589,300	4,520	23,265,364	3,920	22,546,480	3,755	24,426,329	3,993	25,351,994	4,106
2027	26,574,780	4,587	23,109,981	3,957	22,323,052	3,770	24,206,473	4,018	25,189,532	4,139
2028	27,005,735	4,657	23,396,928	4,004	22,470,062	3,788	24,373,941	4,041	25,400,598	4,169
2029	27,393,244	4,733	23,672,301	4,044	22,523,538	3,795	24,426,763	4,056	25,533,622	4,192
2030	27,731,784	4,807	23,913,786	4,087	22,635,614	3,815	24,505,892	4,086	25,681,943	4,221
2031	28,124,743	4,883	24,176,080	4,136	22,774,609	3,833	24,594,835	4,107	25,828,032	4,245
2032	28,535,106	4,954	24,452,457	4,184	22,953,078	3,856	24,728,153	4,126	26,025,025	4,268
2033	28,877,185	5,027	24,723,881	4,222	23,020,099	3,868	24,754,160	4,138	26,118,135	4,279
2034	29,226,104	5,100	24,995,836	4,265	23,133,210	3,889	24,836,500	4,162	26,264,712	4,295
2035	29,637,431	5,176	25,292,181	4,312	23,273,087	3,907	24,935,814	4,186	26,448,425	4,312
2036	30,072,160	5,251	25,601,535	4,363	23,458,668	3,929	25,073,450	4,206	26,703,167	4,329
2037	30,443,177	5,329	25,870,530	4,403	23,535,512	3,941	25,112,904	4,218	26,857,592	4,336
2038	30,795,730	5,406	26,107,536	4,447	23,652,886	3,962	25,204,763	4,237	27,052,810	4,348
2039	31,203,795	5,484	26,367,027	4,492	23,800,510	3,981	25,323,530	4,261	27,270,305	4,363
2040	31,663,032	5,563	26,662,148	4,542	23,991,470	4,003	25,477,999	4,280	27,518,286	4,376
2041	32,040,406	5,645	26,963,765	4,584	24,051,697	4,013	25,535,440	4,291	27,663,772	4,379
2042	32,396,309	5,725	27,224,312	4,630	24,163,358	4,033	25,648,963	4,310	27,853,380	4,391
2043	32,804,017	5,806	27,504,511	4,677	24,296,316	4,050	25,785,666	4,334	28,059,975	4,405
2044	33,264,351	5,888	26,642,236	4,501	23,307,339	3,841	25,369,514	4,125	27,710,144	4,190
2045	33,673,291	5,973	26,104,339	4,542	22,531,449	3,850	25,003,243	4,133	27,414,725	4,191
2046			26,347,425	4,588	22,625,632	3,868	25,079,825	4,146	27,586,216	4,199
2047					22,742,475	3,883	25,157,738	4,165	27,769,781	4,210
2048							25,263,960	4,179	27,995,511	4,221
2049									28,128,983	4,223

Year	2011 Forecast		2012 Forecast		2013 Forecast		2014 Forecast		2015 Forecast	
	Energy Sales	Peak Demand	Energy Sales	Peak Demand	Energy Sales	Peak Demand	Energy Sales	Peak Demand	Energy Sales	Peak Demand
2011										
2012	29,537,065	5,113								
2013	30,402,241	5,268	26,645,594	5,162						
2014	30,077,759	5,214	26,730,662	5,181	26,173,379	5,085				
2015	29,696,144	5,088	27,009,909	5,073	26,440,774	4,976	26,941,493	4,948	24,909,456	4,818
2016	29,535,104	5,174	27,465,223	5,155	26,871,594	5,053	28,303,443	5,199	26,806,247	4,993
2017	29,272,268	5,079	27,507,745	5,054	26,895,484	4,959	29,820,509	5,295	27,900,774	4,963
2018	29,218,074	5,160	27,779,839	5,131	27,147,066	5,032	30,447,195	5,443	28,875,949	5,158
2019	27,459,096	4,550	26,564,725	4,514	25,949,193	4,387	29,703,312	4,853	28,273,204	4,626
2020	26,758,963	4,632	26,190,534	4,594	25,610,885	4,466	29,746,510	4,982	28,371,639	4,757
2021	26,942,285	4,717	26,346,616	4,670	25,754,874	4,541	30,303,370	5,015	28,953,018	4,888
2022	25,794,822	4,364	25,418,209	4,355	24,876,626	4,245	30,335,407	4,945	28,846,072	4,716
2023	25,279,108	4,441	25,101,773	4,426	24,578,079	4,314	30,415,235	5,064	29,154,440	4,832
2024	25,400,736	4,473	25,191,485	4,447	24,680,823	4,337	30,881,707	5,131	29,662,012	4,897
2025	25,565,189	4,554	25,324,654	4,518	24,820,077	4,411	31,353,900	5,249	30,097,645	5,012
2026	25,417,207	4,538	25,146,408	4,493	24,660,497	4,394	31,523,977	5,269	30,264,265	5,027
2027	25,415,870	4,624	25,125,846	4,569	24,661,190	4,473	31,858,382	5,389	30,613,102	5,145
2028	25,807,116	4,712	25,506,510	4,649	25,066,627	4,555	32,624,311	5,518	31,399,287	5,264
2029	26,154,078	4,799	25,843,544	4,727	25,429,197	4,636	33,318,606	5,642	32,060,954	5,386
2030	26,538,739	4,889	26,220,287	4,809	25,838,839	4,722	34,046,691	5,767	32,776,908	5,506
2031	26,913,842	4,982	26,590,759	4,893	26,234,159	4,809	34,766,048	5,892	33,510,385	5,631
2032	27,305,299	5,076	26,979,197	4,977	26,665,560	4,898	35,518,817	6,018	34,303,688	5,753
2033	27,655,782	5,168	27,329,397	5,057	27,045,863	4,986	36,188,208	6,143	34,955,447	5,875
2034	28,049,577	5,265	27,714,128	5,147	27,471,633	5,077	36,924,371	6,271	35,702,131	6,000
2035	28,462,072	5,366	28,115,735	5,237	27,905,169	5,171	37,677,097	6,402	36,463,254	6,127
2036	28,911,388	5,471	28,553,146	5,334	28,379,563	5,269	38,465,210	6,535	37,289,221	6,254
2037	29,324,714	5,576	28,959,068	5,424	28,804,786	5,366	39,161,709	6,666	37,968,614	6,383
2038	29,758,906	5,684	29,383,345	5,524	29,266,146	5,466	39,910,895	6,800	38,730,339	6,514
2039	30,189,645	5,794	29,799,324	5,622	29,722,853	5,567	40,660,418	6,934	39,507,722	6,645
2040	30,702,696	5,906	30,314,961	5,729	30,253,881	5,671	41,486,724	7,073	40,385,721	6,779
2041			30,668,885	5,825	30,660,116	5,775	42,205,675	7,212	41,103,892	6,916
2042					31,158,283	5,883	42,983,454	7,352	41,920,306	7,054
2043							43,771,697	7,495	42,751,535	7,195
2044									43,682,784	7,337
2045										
2046										
2047										
2048										
2049										

	2016 Forecast		2017 Forecast		2018 Forecast		2019 Forecast		2020 Forecast	
Year	Energy Sales	Peak Demand	Energy Sales	Peak Demand	Energy Sales	Peak Demand	Energy Sales	Peak Demand	Energy Sales	Peak Demand
2011										
2012										
2013										
2014										
2015										
2016	24,385,574	4,748								
2017	24,310,043	4,442	24,326,666	4,412						
2018	24,488,538	4,496	24,345,780	4,452	24,749,372	4,423				
2019	23,879,096	4,073	23,736,876	3,999	23,983,613	3,978	25,040,712	4,138		
2020	23,807,264	4,146	23,558,353	4,045	23,769,439	4,023	25,209,986	4,161	23,009,406	4,008
2021	24,063,086	4,223	23,609,099	4,083	23,565,943	3,979	25,811,098	4,228	23,934,269	4,046
2022	23,753,268	4,020	23,284,735	3,899	23,345,806	3,879	25,604,290	4,110	24,327,311	4,013
2023	23,830,417	4,083	23,323,658	3,933	23,299,304	3,887	25,489,637	4,136	24,582,751	4,067
2024	23,929,779	4,095	23,303,162	3,919	23,233,020	3,844	25,620,066	4,132	25,057,775	4,104
2025	24,026,308	4,160	23,249,533	3,947	23,107,882	3,847	25,647,156	4,152	25,202,559	4,142
2026	23,739,923	4,118	22,893,238	3,879	22,733,129	3,766	25,320,633	4,076	24,946,914	4,077
2027	23,658,370	4,178	22,727,216	3,914	22,513,884	3,782	25,105,546	4,103	24,804,969	4,113
2028	24,007,402	4,240	22,983,852	3,956	22,677,928	3,801	25,263,457	4,124	25,027,763	4,146
2029	24,345,274	4,310	23,164,258	3,992	22,730,490	3,821	25,332,288	4,140	25,181,510	4,173
2030	24,639,863	4,377	23,366,109	4,031	22,830,778	3,839	25,435,683	4,161	25,341,494	4,207
2031	24,978,839	4,448	23,602,971	4,073	22,956,011	3,855	25,572,825	4,187	25,491,367	4,236
2032	25,289,340	4,512	23,870,481	4,116	23,113,947	3,875	25,742,015	4,206	25,700,469	4,266
2033	25,558,141	4,577	24,023,199	4,149	23,166,188	3,888	25,843,245	4,224	25,833,794	4,289
2034	25,833,810	4,642	24,219,134	4,187	23,259,499	3,907	26,003,596	4,249	26,035,887	4,322
2035	26,169,691	4,711	24,443,036	4,227	23,378,823	3,922	26,180,471	4,277	26,272,292	4,359
2036	26,513,627	4,780	24,707,953	4,271	23,536,782	3,940	26,414,886	4,299	26,561,810	4,398
2037	26,828,027	4,851	24,880,444	4,308	23,590,653	3,949	26,571,727	4,322	26,758,680	4,428
2038	27,113,532	4,922	25,090,743	4,350	23,684,707	3,967	26,764,821	4,351	26,999,890	4,465
2039	27,444,780	4,994	25,342,892	4,393	23,808,448	3,982	26,978,929	4,386	27,262,908	4,503
2040	27,813,447	5,066	25,647,839	4,442	23,969,710	4,000	27,216,675	4,415	27,562,805	4,542
2041	28,143,772	5,143	25,842,694	4,484	24,006,127	4,007	27,365,684	4,442	27,776,997	4,571
2042	28,431,109	5,218	26,073,324	4,529	24,091,749	4,023	27,557,028	4,475	28,035,912	4,608
2043	28,767,033	5,293	26,338,508	4,575	24,198,860	4,036	27,763,431	4,514	28,307,572	4,647
2044	29,139,218	5,368	25,466,223	4,396	23,179,655	3,824	27,401,942	4,318	28,018,270	4,457
2045	29,501,351	5,449	24,812,085	4,435	22,378,362	3,828	27,110,947	4,345	27,799,660	4,484
2046			25,048,682	4,480	22,444,915	3,842	27,289,921	4,378	28,045,500	4,516
2047					22,541,540	3,854	27,482,739	4,416	28,290,432	4,548
2048							27,698,587	4,445	28,571,277	4,579
2049									28,737,835	4,598

Financial Forecast

	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
SPS Resource Position - Assuming all Harrington Units are Converted (MW)	**520**	**280**	**215**	**(39)**	**(193)**	**(224)**	**(507)**	**(783)**	**(1,894)**	**(2,489)**	**(2,861)**	**(2,942)**	**(3,328)**	**(3,365)**	**(3,769)**	**(3,820)**
Less Harrington 1 (MW)	(340)	(340)	(340)	(340)	(340)	(340)	(340)	(340)	(340)	(340)	(340)	(340)	0	0	0	0
SPS Resource Position - Assuming Harrington Unit 1 is retired (MW)	**180**	**(60)**	**(125)**	**(379)**	**(533)**	**(564)**	**(847)**	**(1,123)**	**(2,234)**	**(2,829)**	**(3,201)**	**(3,282)**	**(3,328)**	**(3,365)**	**(3,769)**	**(3,820)**

Planning Forecast

	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
SPS Resource Position - Assuming all Harrington Units are Converted (MW)	**148**	**(136)**	**(264)**	**(564)**	**(758)**	**(830)**	**(1,135)**	**(1,479)**	**(2,620)**	**(3,258)**	**(3,627)**	**(3,777)**	**(4,201)**	**(4,252)**	**(4,709)**	**(4,789)**
Less Harrington 1 (MW)	(340)	(340)	(340)	(340)	(340)	(340)	(340)	(340)	(340)	(340)	(340)	(340)	0	0	0	0
SPS Resource Position - Assuming Harrington Unit 1 is retired (MW)	(192)	(476)	(604)	(904)	(1,098)	(1,170)	(1,475)	(1,819)	(2,960)	(3,598)	(3,967)	(4,117)	(4,201)	(4,252)	(4,709)	(4,789)

CRA Charles River Associates

D. Dean Koujak

Principal

Juris Doctor
Hofstra University

MBA
Stony Brook University

BS, Engineering Management
New York Institute of Technology

Mr. Dean Koujak is a principal in the energy practice of CRA. Dean provides energy market and procurement advisory services to utilities and other stakeholders in the electric power industry. Prior to joining CRA, Dean was a Director in the Energy Practice of Navigant, which was later acquired and rebranded as Guidehouse, Inc. While at Navigant and later Guidehouse, he served as a consultant to Utilities and other stakeholders in the industry advising on procurement, large scale renewable development, renewable portfolio standards compliance, utility business strategy, decarbonization pathways, transmission infrastructure planning, grid modernization, non-wires solutions, power markets matters (NYISO/PJM/ISO-NE/MISO), energy efficiency program implementation, utility contract negotiations, electric resource planning, regulatory compliance strategy, M&A and industry litigation. He has managed multiple key utility initiatives throughout all stages of the projects including planning, design, implementation and execution. Over time, he has enabled electric utilities to successfully plan, evaluate, select, and contract over 10 GW of capacity from thermal, renewable, storage and demand response resources. He has supported and been engaged on competitive power procurement and electric market matters across the U.S. and Canada. Dean is highly qualified in independent procurement oversight and implementation and has served in a variety of capacities in this regard including as an independent evaluator, administrator, independent monitor, and independent observer. In addition, he has developed regulatory filings and reports submitted before Public Utility Commissions on matters pertaining to resource procurement, in addition to distributed energy resources, renewable portfolio standards, rate design, non-wires alternatives and utility organizational modernization.

Summary of Expertise

- ***Power Resource Procurement and PPA Negotiations***: Renewable and conventional resource procurement advisory services to facilitate an optimal solicitation design, evaluation, final selection, and PPA/contract negotiation process. Served as both an expert advisor and independent evaluator/monitor.
- ***Energy Efficiency & Renewables:*** Energy efficiency and renewables program planning and implementation.
- ***ISO Market Expertise:*** Advisory relating to ISO market rules, including interconnection, market pricing, resource retirement/additions forecasting, and reliability/public policy driven needs.
- ***Regulatory and Compliance:*** Development of regulatory filings and testimony related to renewables policy, resource procurement, and energy efficiency.

- ***Resource Planning and Strategy:*** Comprehensive evaluation of resource options to meet reliability driven needs in addition to meeting renewable portfolio standards. Evaluated pathways to achieve aggressive GHG and RPS targets.
- ***Grid Modernization:*** Options to enhance the distribution grid and ability to interconnect/dispatch a diverse array of Distributed Energy Resources (DERs).
- ***M&A Due Diligence:*** Utilities and renewables acquisition advisory.
- ***Expert Testimony:*** Provided expert testimony on behalf of clients in disputes relating to the areas of expertise noted above.

Selected Consulting Experience

Procurement

- **Arizona Public Service 2020 All-Source RFP –** Served as Independent Monitor for APS's All Source solicitation.
- **Xcel Sherco RFP** – Served as Independent Auditor on the RFP for 500 MW of Solar.
- **DTE Energy 2019 All-Source RFPs for Wind and Solar Resources –** Provided expert procurement advisory, monitoring and evaluation to DTE in its 2019 All-Source RFP.
- **Independent Observer of the Maui Electric Company RFPs –** Appointed by the Hawaii Public Utilities Commission to serve, over the course of 4 years, as an Independent Observer. Covered two RFPs for Variable Dispatchable Renewable Generation and PPA negotiations.
- **Arizona Public Service 2019 Solar plus Storage RFP, Battery-Ready Solar RFP –** Served as the Independent Monitor on the RFP for approximately 100 MW of Solar plus Storage (4 hour).
- **American Electric Power 2017 RFP for Solar –** Served as the Independent Evaluator of the AEP 2017 RFP for Solar.
- **NYPA Large Scale Renewable RFP I and II –** Supported NYPA in the development of the RFP, management and evaluation of utility-scale renewable proposals (Wind, Solar), including those with Storage combinations, to comply with the CES.
- **NJ SREC-II Based Financing Program –** On behalf of Jersey Central Power & Light, Atlantic City Electric, and Rockland Electric Company, served as the Solicitation Manager of the SREC-II program – a competitive solicitation offering a 10-year SREC PSA for competitively bid projects.
- **CIC/SaskPower CCGT 2019 RFP –** On behalf of the Crown Investments Corporation of Saskatchewan, served as the Value for Money independent advisor for a Combined Cycle Generating facility.
- **Battery Storage Procurement Analysis –** On behalf of a manufacturer in the Ontario region, assessed contracting options and performance of battery storage technologies, and the unsolicited proposals received.

- **ConEd BQDM Reverse Auction –** Advised in the designed, development and implementation of a reverse auction for demand response as a non-wire alternative.
- **2010 LIPA Generation and Transmission RFP** – Advised on the development, design and evaluation of an "All-Source" style resource RFP which assessed a wide range of resource options proposed to LIPA, including HVDC Transmission, combustion turbine generation, hydro energy imports, off-shore wind farms, and battery storage.
- **FirstEnergy Ohio REC Compliant RFP** – From 2011 to 2019, served, annually, as the independent RFP manager on behalf of the FirstEnergy Ohio Utilities to procure their annual RPS requirements for Non-Solar and Solar RECs.
- **New York Power Authority 100-MW Solar Initiative RFP** – Provided advisory services on the development and evaluation of the RFP.
- **Massachusetts DOER Solar Stimulus Program RFP for Wastewater Facilities** – Provided assistance in the development of the RFP to design, build and install Solar Photovoltaic systems located on 12 town wastewater facilities ("Participants") in Massachusetts.
- **Natural Gas Supply RFP/Fuel Management RFP** – Developed an RFP to procure and manage 54,000 Dthms of Natural Gas and backup oil for a large CCGT on behalf of a Utility.
- **Duke Carolinas Solar RFP** – Advised on the development and evaluation of the Solar RFP.
- **LIPA Solar Photovoltaic RFP** – Served as PMO and performed the economic evaluation of a procurement of 50 MWs of Solar Photovoltaic energy projects.
- **LIPA Renewable Energy RFP** – Served as PMO and performed the economic evaluation of a procurement of 325 GWhs of Energy and RECs from qualified resources that are capable of delivering to NYISO Zone K.
- **Power Supply Management RFP** – Provided assistance in the management of a procurement that competitively bid the front-office and back-office power supply management services.
- **LIPA 600 MW Generation Capacity RFP** – Advised on the development and execution of a qualitative evaluation and economic assessment relating to the procurement of generation and transmission resources both within the ISO zone and externally connected via transmission.
- **RFP for Temporary Generation** – Assisted in the management and evaluation of the procurement of mobile generation units to fill a capacity shortfall expected in the summer of 2004.
- **LIPA 2005 Capacity RFP** – Assisted in the management and evaluation of an RFP for flexible resources.
- **Energy Efficiency RFPs** – Served as PMO, developed and evaluated the response to several energy efficiency RFPs for EM&V, implementation and direct install services.

Energy Efficiency & Renewables

- **Hawaii Big Wind Whitepaper –** Developed a technical report relating to the implementation of an HVDC transmission and Wind project on behalf of the State.
- **Energy Efficiency Project Management** – Served as a project manager and coordinator of a comprehensive energy efficiency initiative for a northeast public electric utility geared specifically to reduce Peak Energy Load.
- **Solar Regulatory Support**— Reviewed the economics of the proposed 137 MW solar project through an analysis of the PPAs between a solar developer and the Southern California Public Power Authority.
- **Independent Review of Wind Projects**— Assessment of rate recovery issues relating to 6 wind PPAs as it pertained to subsequent amendments.

ISO Market Expertise

- **Transmission Siting Review** – On behalf of multiple clients, reviewed the NYISO Transmission System and identify key markets and interconnection points that address transmission congestion issues noted in the NYISO's Reliability Needs Assessment.
- **NYISO Stakeholder Meetings** – On behalf of multiple clients, monitored changes and developments among the various planning working groups.
- **Market Advisory –** Led development of LBMP nodal price forecasts, capacity price forecasts, generator retirement forecasts, and renewable project development tracking.

M&A Due Diligence

- **M&A Target Due Diligence –** Develop list of targets and profiles for a confidential firm seeking to acquire a company within the electric power industry.
- **Hydro Asset Due Diligence** – On behalf of a large investment firm in Canada, conducted due diligence into a potential acquisition of a legacy hydro-electric asset. Led review of potential contracting options and offtakes in the region, summarizing the options and relative negotiating position of the project owner after its current offtake agreement expires. Reviewed project agreements for potential risks for consideration
- **Battery Storage Project Acquisition Due Diligence –** On behalf of a multinational investment firm, conducted due diligence on the risk factors associated with the agreements executed by a project developer. In the context of market intelligence, reviewed offtake agreements, EPC contracts, Long-Term Service Agreements and letters/expressions of interest from potential offtakes.
- **T&D Utility M&A Target Due Diligence –** On behalf of a confidential client, performed a market screening of potential T&D Utility targets in North America based on criteria that fit the client's acquisition strategy.

Regulatory and Compliance

- **PSEG LI Utility 2.0 Plan –** Managed the development of the Utility of the Future and Rates Modernization components of the PSEG LI filing, as accepted by the NY DPS.

- **ConEd/National Grid Whitepaper –** Under the NY DPS proceeding which ultimately established the NY Clean Energy Standard, developed a whitepaper and comments to NY PSC staff with respect to the optimal procurement strategies and structures for meeting the 50% by 2030 renewable target.
- **Hawaii DBEDT PUC Filing –** In support of the development of an undersea HVDC cable to enable the development of Wind power, provided DBEDT with technical comments and input with respect to the cable configurations, technical feasibility with respect to cable permitting/routing and economic impact with respect to the cable (in stand-alone configuration) and in combination with a wind power project.
- **ATCO Fort McMurray 500 kV Transmission Project Analysis –** Led analysis of cost of compliance and probabilistic assessment of potential failure to meet performance standards for a proposed transmission project.
- **NYPA NERC CIP Compliance –** Provide ongoing project management assistance to NYPA with respect to NERC standards compliance in the areas of Physical Security Protection and Compliance Repository requirements.
- **NYPA Business Controls Group Policy & Procedures –** Develop framework, organization and template for the New York Power Authority's initiative to organize, catalogue and update its corporate policies.
- **NYPA Emergency Management –** Develop comprehensive recommendations to benchmark, update, integrate and formalize NYPA's Emergency Management program.
- **Connecticut Net-Metering Legislation** – For an industry stakeholder, drafted proposed revisions to the current net metering legislation to expand its limits and applicability.
- **FirstEnergy Ohio REC Pricing –** Prepared an expert report discussing the Ohio SREC and REC markets with comparisons to regional markets.

Resource Planning

- **Resource Planning Coordinating Committee ("RPCC") support –** Provided long-term support (10+ years) to the Long Island Power Authority's Resource Planning committee from a technical, economic and feasibility modelling perspective.
- **Bahama Ocean Cay Island Power Options Analysis –** Directed an engagement to develop an electric resource plan for a cruise island destination.
- **NALCOR Hydro** – Participated in an independent review of NALCOR's analysis relating to the Muskrat Falls Hydro and Labrador Link HVDC project.

Grid Modernization

- **REVConnect –** Led the development of the online platform available at nyrevconnect.com helping utilities source ideas and solutions from the marketplace through a formal procurement-style process that screens and fosters the most promising opportunities that pass established screening criteria.

- **Southern California Edison Integrated Grid Project (IGP) –** Provided project management assistance on demonstration project intended to showcase advanced grid technologies in response to California legislation and policy directives under AB327.
- **Southern California Edison Distribution System Technology Assessment & Business Strategy Review –** Organized and lead the review of over 50 distribution technologies for review and implementation consideration.

Professional history

2021-Present	Charles River Associates, Principal, Energy
2003–2021	Navigant Consulting, Inc./Guidehouse, Inc.

2018 – 2021 *Director*, Energy, Sustainability, and Infrastructure Practice

2015 – 2018 *Associate Director*, Energy Practice

2009 – 2015 *Managing Consultant*, Energy Practice

2007 – 2009 *Senior Consultant*, Energy Practice

2005 - 2007 *Consultant*, Energy Practice

2003 - 2005 *Analyst/Associate*, Energy Practice

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SYSTEM STRATEGY & BUSINESS OPERATIONS
REQUEST FOR CAPACITY PLANNING REVIEW
FOR INTERNAL USE ONLY
Valid for 3 Months From Review Date

Print Form

Project Name: SPS Harrington Conversion to Gas O
RER #: 18-287
Requested By: Jeff Hild
Phone Number: 303-571-7391
WB#:
JDE#:

Date Submitted: 12/5/2018
Request Needed By: 12/12/2018

Operating Company:	SPS	Type of Proposal:	cost estimate to converst power pl
Service Center/Area:	Other	If Other:	
Street / City:		Customer/Business Name:	Harrington Power Plant
System:	High Pressure	Existing Customer:	No
BTU Zone:		Confidentiality:	Confidential
MAOP:		Requestor:	Gas Resource Planning
Operating Pressure:			

Reason for Request

Review of cost to convert an existing coal power plant to natural gas

look at converting 1) one boiler 89,000 Dth/day 2) two boilers at 177,000 Dth/day both require 90 psig pressure

pressure avaiable from Elpaso pipeline = 600 psig

Response to Request:

To provide gas to the Harrington Power Plant (SPS) would require:

for one boiler (89,000Dth/day) with 600 psig from El Paso and 130 psig minimum at the Harrington Power Plant in order to provide a 90 psig delivery pressure to the plant. approximately 22 miles of 12" X-52 0.250" wall pipe.
The capital estimate for the facilities to provide gas to one unit at Harrington Power Plant would be = $32.7M

for two boilers (177,000Dth/day) with 600 psig from El Paso and 130 psig minimum at the Harrington Power Plant in order to provide a 90 psig delivery pressure to the plant. approximately 22 miles of 20" X-60 0.375" wall pipe.
The capital estimate for the facilities to provide gas to two units at Harrington Power Plant would be = $47.0M

Analysis By: Mike Miller
Date: 12/5/2018
Reviewed By: Sean Lynn
Approved By: Mike Miller

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SYSTEM STRATEGY & BUSINESS OPERATIONS
REQUEST FOR CAPACITY PLANNING REVIEW
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Important Notes & Reminders:

Assumptions, Analysis & Results:

Analysis By: Mike Miller Date: 12/5/2018 Reviewed By: Sean Lynn Approved By: Mike Miller

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SYSTEM STRATEGY & BUSINESS OPERATIONS
REQUEST FOR CAPACITY PLANNING REVIEW
FOR INTERNAL USE ONLY
Valid for 3 Months From Review Date

Exhibit 1:

Analysis By: Mike Miller Date: 12/5/2018 Reviewed By: Sean Lynn Approved By: Mike Miller

Pipeline Feasibility Study

Xcel Energy - 20" Xcel Harrington Pipeline FEED

Prepared for:

Chris Whiteside
790 S. Buchanan Street, 5th Floor
Amarillo, TX 79101

Prepared By:

ENGineering®

28100 Torch Parkway, Suite 400
Warrenville, Illinois 60555

June 12, 2020

Revision 0

Table of Contents

Attachments

Attachment A – Cost Estimate
Attachment B – Comparable Projects
Attachment C – Feature Crossing List
Attachment D – Process Flow Diagram
Attachment E – Preliminary Project Schedule
Attachment F – Permit Matrix
Attachment G – EPA Envirofact Point Locations
Attachment H – Federally Listed Threatened and Endangered Species
Attachment J – Pipeline Route Exhibits

Disclaimer:
This review has been prepared utilizing scope of work and information provided by Xcel Energy at the time of review. If the scope of work changes, additional review may be necessary. The review was conducted utilizing publicly available data and no project specific conversations have been completed with any agencies. There may be additional impacts and permitting that need to be explored and confirmed at later stages when conversations with agencies are more appropriate.

1.0 Executive Summary

EN Engineering (ENE) has completed a Front End Engineering Design (FEED) Study for Xcel Energy (Xcel) that assesses the feasibility to transport approximately 265,000 Dth/day of natural gas from an existing El Paso Natural Gas (EPNG) pipeline Northwest of Amarillo, TX, with an alternate supply connection from Natural Gas Pipeline Company of America (NGPL), to Xcel Energy's Harrington Generating Station. The project is comprised of a new 22 mile, 20-inch diameter pipeline with related facilities, including a custody transfer meter station at each 3rd party pipeline tie-in, pig launching and receiving facilities, mainline block valves, and a check meter/regulator station at the delivery point for pressure/flow control. The pipeline will feed the Harrington Power Plant after the conversion of existing coal-fired units to natural gas units.

Items analyzed for this project, and contained within this study, are project cost estimates, project schedule, pipeline design/route review, construction and risk analysis, and environmental regulatory information.

The quality of the Google Earth aerial imagery and elevation data allowed ENE to conduct the study without the need for a site visit. There are two (2) areas of interest where the pipeline crosses a railroad or a major highway (US Hwy. 287), where a Horizontal Directional Drill (HDD) will be utilized. There are additional crossings through streams or wetland that will utilize HDDs or conventional bores to eliminate the need for a U.S. Army Corps of Engineers (USACE) Section 401/404 permit.

2.0 Cost Estimate

2.1 Overview

Cost estimates are within a +/- 20% accuracy level based on available information and preliminary scope. Estimates were prepared by ENE with good faith and care using third party vendors, contractor estimates, and recent project costs, where available. Below, Table 1 summarizes the estimates in each major category for current pricing. See Attachment A for the full estimate.

Total Installed Cost (TIC) Estimate	
Categories	**Total Cost**
Materials	$10,498,700
Construction	$20,187,300
Survey	$711,100
Right-of-Way	$3,261,500
Legal & Public Affairs	$215,000
Environmental	$217,300
Inspection	$774,000
Engineering	$812,900
Admin & Gen	$458,500
Line Pack	$41,000
Contingency	$5,576,600
Total	**$42,753,900**

Table 1 – Harrington Pipeline Estimate Summary

2.2 Assumptions

Estimate assumptions are listed below.

1. Estimates are based on current market conditions and assumes adequate labor resources are available at the time of construction.
2. All pipe is assumed to be triple random lengths (TRL). Freight for FBE-coated TRL pipe is assumed to be by truck at $10/ft, but the shipping price could decrease to $6/ft if shipped by rail.
3. Sales tax is estimated as 8.25% and assumed to be the same at time of purchase.
4. The pipeline construction costs are based on budgetary contractor estimates and recent historic unit pricing from competitive bids for various other Texas pipeline jobs. The contractors have done similar work in Texas and have experience with pipeline construction projects of this size.
5. Budgetary estimates for the facility construction work (meter station, control valves, tie-ins) were generated from recent historical pricing for similar items. Equipment costs were based on a combination of budgetary estimates and recent historic pricing.

6. Pipeline survey budgetary costs were provided by local surveyors, and an approximate average cost was used. Survey includes the preliminary pipeline route and cadastral survey with plat development, pre-construction staking, and as-built/construction survey. These costs include all anticipated personnel and expenses over the course of the survey duration.

7. Estimated ROW costs, including damages along the pipeline corridor along with costs for additional surface easements and workspace, were determined with an estimate from a Texas Land Management company.

8. Estimated environmental costs include desktop and on-site surveys, biological and cultural surveys, reporting, mitigation, restoration, environmental training, post-construction monitoring, and permitting from agencies. Budgetary estimate was provided by a Texas Environmental Firm.

9. Project contingency is assumed as 15% of the overall cost of the project.

10. Costs associated with in-line pipeline inspection using caliper and smart pigs are estimated costs based on previous projects. Both caliper and smart pig runs have been accounted for in the attached TIC.

Additional assumptions are reflected in the Comments section of Attachment A as they apply to specific cost items.

2.3 Comparable Projects

ENE researched comparable projects using the FERC database of approved major pipeline projects. While no data was available for actual costs, all FERC 7(c) submittals require a project cost estimate to be included with the application. The categories included in these high-level estimates varied by project, so ENE combined categories as necessary to consolidate the estimates into ten (10) major categories – Materials, Construction, Right-of-Way, Survey, Engineering & Inspection, Environmental, Legal & Public Affairs, Line Pack, Admin & General, and Contingency. See Attachment B for a list of eight (8) projects that were considered comparable to the Harrington pipeline and the associated costs. The comparable projects were chosen based on similarities to the Harrington pipeline in terms of pipeline size.

The primary consideration for direct comparison between these projects and the Harrington pipeline is that FERC projects often have more stringent environmental, construction, and inspection requirements. Although the Harrington pipeline will not require a FERC permit, many permitting agencies have been requiring more detailed survey and permit submittals in recent years. While it is impossible to predict the future requirements of these agencies, it is clear that they are currently trending toward FERC requirements.

Also shown in Attachment B is a breakdown of the cost for each category as a percentage of the overall project cost.

2.4 Operating & Maintenance

After the line has been constructed and commissioned, Xcel will need to consider long-term operating and maintenance (O&M) costs. These costs may include but are not limited to:

- Additional personnel required to operate and maintain the pipeline
- Tools and equipment
- Inline inspection
- Aerial inspection and patrol
- Annual pipeline and valve maintenance
- Anomaly repairs
- Cathodic Protection[1]

Costs may vary significantly based on pipeline operator's O&M philosophy.

3.0 Schedule

The project is expected to be completed in a total of 42-50 weeks after the project is sanctioned. The critical path milestones are survey permission, land acquisition, pipe procurement, and installation. A preliminary Level 3 schedule is provided in Attachment G.

4.0 Procurement

4.1 Procurement Strategy

Xcel, with assistance from the design firm, will identify qualified bidders for the various material required for the project. The procurement team will provide specifications, solicit quotations, analyze bids, provide recommendations, and/or suggest third party inspection teams as needed for material procurement.

It is imperative that pipe mills are engaged directly instead of utilizing a distributor in order to maintain control of the production and inspection schedules. Depending on market conditions existing at the time of project kick-off, it may be prudent to commit to the necessary steel as soon as possible for the pipe.

Qualified mainline construction contractors will be identified as soon as the bid package is nearing completion. A list of contractors with experience in the Texas area are listed below in Section 9.2. Early identification assures a robust pool of contractors with available labor and equipment. Xcel, with assistance from the design firm, will develop bid documents, solicit quotations, analyze bids, and select a contractor.

[1] Cathodic Protection (CP) - a technique used to control the corrosion of the pipeline by making it the cathode of an electrochemical cell. CP for this project consists of a Groundbed and a Rectifier with test stations for monitoring.

4.2 Market Pricing Sensitivities

Whether or not tariffs exist as the project rolls out will play a major factor as to price and availability for some of the material, especially pipe. As pipe is the primary material cost for this project, Xcel should be aware that tariffs on imported steel drive up domestic prices. Consolidations, mergers and acquisitions can also affect pricing. Budgetary line pipe estimates were secured through US steel mills with domestic product.

The current market conditions due to depressed oil pricing and COVID-19 create additional risks and opportunities. The pipe mills contacted for estimates have stated that COVID-19 has not seemed to have a direct impact on steel pricing or availability. They are still in production as essential businesses and future impacts are not expected from that issue. However, current crude pricing has put a damper on new oil pipeline projects leading to an excess supply of pipe. Further, estimates received for materials, construction, survey, etc. for this exercise may be lower than usual, as vendors are pushing to win projects, even in the budgetary phase. This creates an opportunity to take advantage of the lower prices in the current market, but also creates a risk in increased pricing if the project is not executed until after the market corrects.

4.3 Lead Times for Major Material

The quantity and size of the pipe for this project is expected to have a lead-time of 12-18 weeks, depending on mill space. The remaining material should have lead times not to exceed 18 weeks, including any drawings for approval. Material lead times are not expected to be the critical path for this project unless market conditions change significantly.

4.4 Other Known Projects Impacting Material Acquisition

There are currently no known projects that would affect this project if material is procured as outlined above.

5.0 Land Use and Acquisition

For the purpose of this FEED study, ENE has assumed a 100-foot working corridor, with the pipeline laid within a 50-foot permanent easement, and the additional 50 feet considered as Temporary Workspace (TWS).

Analysis has been conducted based on land ownership in Potter County, TX. The total estimated number of directly impacted parcels is thirty-two (32). Land use has been evaluated based on agricultural, residential, and commercial usage. Current land use for much of the project is for agricultural purposes.

Land values for Right of Way (ROW) will be reflective of the land use and the demand created by competition for land rights in the specific locale. Additionally, it will be dependent upon the stage of acquisition negotiations.

Since this project is not expected to be certificated under FERC authority, eminent domain is not anticipated to be exercised. If required, it may be possible as a utility project to use eminent domain. A good faith effort to negotiate land rights is required. All negotiations should be documented and made in writing.

6.0 Survey Strategy

6.1 General

Several survey phases will be required for the project. The design phase will include control survey, design survey, subsurface utility exploration (SUE), and boundary survey. Construction staking will begin prior to mobilization for each spread. As-Built survey will be completed throughout the construction phase.

6.2 Control Survey

The Survey Vendor is to establish control monuments within proximity of the proposed pipeline corridor. Control monuments are to be permanent in nature and set with 5/8" rebar at locations presumed not impacted by construction activity. The horizontal datum for this project will be State Plane Texas North (4201), NAD 83 and vertical datum NAVD 88. Monument recovery sheets are to be prepared and should include reference ties to survey control and corresponding photos.

The Survey Contractor is to assume a control pair will be required every five (5) miles along the route; therefore, five (5) control pairs will be required.

6.3 Design Survey

Survey Vendor will conduct a preliminary survey of the project route to support the Engineering Design Phase. The survey is to extend 100 feet each way from the proposed centerline (200-foot wide corridor). Items to be included in this task include:

- Topographic Survey sufficient to produce 2-foot contours
- Edge of Road Crossings
- Centerline of Road Crossings
- Road ROW Limits
- Water Body Crossings including centerline and top & bottom of banks
- Ditch Lines
- Fence Lines
- Crop/Tree Lines
- Underground Utilities
- Overhead Utility Crossings (including heights)
- Utility Poles (including pole identification numbers)
- Environmental Features
- Any other feature that affects the constructability

Survey Vendor is to utilize sub-centimeter GPS survey equipment to complete this work. In areas where GPS is not available, survey is to be completed using conventional survey methods.

Topographic surveys are to be performed at all surface site locations including contractor yards, pipe yards, valve sites, and meter stations. Topographic and existing features are to be captured at each location suitable to produce 1-foot contours to be used for Engineering Design.

Survey Vendor is to locate the centerline of all proposed access roads determined through the course of the Detailed Design Phase of the project. These roads are to be surveyed from the public road to the construction footprint. Feedback from Xcel S&LR team has indicated that access roads on the entire ROW are not required as long as there is sufficient access to above-grade utilities such as valve sets, test stations, etc. One (1) access road was assumed, totaling 1,800 feet, for access to the upstream meter station at the EPNG tie-in. It is assumed that no additional access roads are required for the meter station at the NGPL tie-in or for anywhere else along the pipe route.

6.4 Subsurface Utility Exploration

Survey Vendor will perform a Level A-D SUE Investigation per CI/ASCE 38-02 Standard Guidelines for the Collection and Depiction of Existing Subsurface Utility Data. Level B-D SUE Investigations are to be completed within the ROW limits of each road crossing. Level A Test holes will be completed at each utility crossing.

Items to be field verified include, but are not limited to:

- Overhead power or telecommunication lines (With High and Low Wire Sag Heights)
- Underground pipelines
- Underground telecommunications
- Uncapped/Capped/Abandoned Shallow Wells

6.5 Boundary Survey

Survey Vendor will perform partial boundary surveys to generate a parcel mosaic to support the ROW acquisition phase. The boundary mosaic is to be field verified by at least two property corners or sufficient cadastral evidence is to be located to tie down all parcel lines that will be crossed or paralleled by the proposed project footprint. Xcel will provide an updated Line List identifying parcels that have survey permissions and will inform survey of any changes as they occur. All Boundary efforts are to be collected to meet Texas Board of Professional Engineers and Land Surveyors minimum survey requirements.

Survey Vendor will develop approximately thirty-two (32) certified plats and legal descriptions for easement acquisition and recordation in accordance with the Texas Board Rules and Regulations relative to the practice of land surveying. The Survey Vendor will be responsible for depicting the construction footprint provided by the design team on each parcel and providing all necessary survey information required to support the land acquisition. All certified plats will be completed on an as-needed basis when the Company ROW team specifies the schedule.

6.6 Construction Staking

Survey Vendor will stake the construction footprint at the beginning of the construction phase. Pipeline route will be staked on both sides of the ROW and along the centerline of the pipe route at 100-foot station intervals with additional staking at each Point of Intersect[2] (PI). All TWS, access roads, contractor yards, and pipe yards are to be staked during this phase to clearly define the limits.

6.7 As-Built Survey

Survey Vendor is required to complete an in-ditch as-built survey through the course of the construction phase. The Survey Vendor will tally the pipe electronically/manually, locate the alignment of the pipeline in the ditch and will locate all appurtenances including, but not limited to: welds along with welder ID's and weld numbers, x-rays, heat numbers, joint numbers, serial numbers, coating type, side bends, sags, over bends, factory bends, pups, wall thickness changes, cad welds, depth of cover, test leads, breakers, rock shields, pipe weights, and all other pertinent data required to support Xcel's data requirements.

7.0 Pipeline Design Review

7.1 Project Design Parameters

Table 2 lists the project design parameters used for preliminary design.

Description	Value	Unit
Pipeline MAOP	1,125	PSIG
Estimated Inlet Pressure (EPNG)	600	PSIG
Estimated Inlet Pressure (from NGPL)	600	PSIG
Minimum Delivery Pressure (at Harrington)	100	PSIG
Peak Hour	11,042	DTH/HR
Ambient Conditions	-20 to 120	°F
Design Gas Temperature	60	°F
Piping Design Velocity	< 100	FPS
Minimum Depth of Cover	4	FT

Table 2 – Project Design Parameters

7.2 Class Locations

Class locations are based on CFR Part 192 criteria. The majority of the pipeline was determined to be Class 1 from review of aerial imagery along the route. All trenchless crossings and fabrications are required to meet Class 2 in these areas. To account for future development, the entire pipeline is designed to Class 3 locations. The 20", 0.375" W.T. X60 pipe selected meets a pipeline MAOP of 1,125 psig for Class 3 areas. If a higher MAOP is required, the pipe grade or wall thickness will need to be increased or the location classification should be assessed further.

[2] Point of Intersect (PI) - where the direction of the pipeline changes

7.3 Valve Spacing

Valve spacing is based on the CFR Part 192 criteria below.

Class 1 – 20 miles
Class 2 – 14 miles
Class 3 – 8 miles
Class 4 – 5 miles

To meet Class 3 location requirements, two (2) mainline valve sets are included in the estimate, which equates to approximately 7-mile spacing between the launcher/receivers and valve sites. See Attachment D for a preliminary Process Flow Diagram (PFD) of proposed pipeline facilities and Attachment J for the Pipeline Route Exhibits.

7.4 Route Adjustments

During the early stages of the FEED Study, Xcel and ENE assessed the original route provided with the request. An alternate route to the North was selected and refined to minimize the quantity of PIs and remove one of the railroad crossings. The final FEED route does not completely follow existing access roads to minimize the quantity of PIs, but should have sufficient access to all above grade components such as valve sets, cathodic test stations, coupon test stations, etc.

7.5 Feature Crossings

There are sixteen (16) feature crossings along the pipeline route. These include roads, railroads, streams, rivers, and wetlands. ENE took a conservative approach and considered all features to be installed via trenchless technology. See Attachment C for the Feature Crossing List.

Crossings marked as bore will be installed via conventional auger/slick bore method. The maximum length for this method was approximated to be 250 feet but may change based on soil types determined by future geotechnical investigations.

Crossings marked as HDD will be installed via Horizontal Directional Drilling. There are five (5) major crossings, totaling an estimated 6,000 feet. These crossings are anticipated to be large-scale HDD operations that require large clearances from highways, railroads, or waterbodies due to terrain. In general, waterbodies should be drilled with a minimum clearance of 25 feet from the riverbed and be outside of any floodplain with the channel. On-Site Environmental Field Surveys should be conducted to determine the exact extents of the natural resources. The depth under the highway will be limited by the geometry and bend radius for 20" pipe and is anticipated to be at least 25 feet.

Minor wetland and stream crossings marked as HDD might be able to utilize a small-scale HDD rig that is capable of lower entry and exit angles. This allows for a shorter, shallower HDD with lower drilling fluid pressures. Some of the wetland and stream crossings are in a ravine and will require a longer and deeper HDD due to due to the natural elevation, entry, and exit points.

7.6 Meter Station & Control Valve Stations

The start of the pipeline occurs at the receipt point from EPNG, which includes a custody transfer meter and a pipeline pig launcher. An alternate gas supply from NGPL includes a custody transfer meter; this facility will be located along the proposed pipeline near Mile Post 4. The pipeline termination occurs at the Harrington Plant, which includes a pipeline pig receiver, check meter, and pressure control valves.

The metering and control valve facilities are assumed to be field-built, not skid manufactured, in order to minimize total facility cost. The meters are expected to be 4-path ultrasonic meters. The control valves are expected to operate in a monitor/worker setup with bypasses around each. Preliminary equipment sizing was completed as part of this study but should be verified during detailed design. A budgetary estimate was received for the meters, while all other material and construction costs were based on recent historical costs.

It is assumed that the 3rd party supply pipelines have an MAOP of 1125 psig or less, therefore, costs associated with over-pressure protection (OPP) are not included.

Access roads are to be placed only where needed and when existing roads are not present. At this time, it is expected that an 1800-foot access road will only be required for the facility at the EPNG tie-in. This road will originate at the existing railroad frontage road and terminate at the EPNG facility. The facility at the NGPL tie-in has sufficient existing access roads. No additional access roads are expected to be needed.

8.0 Geotechnical Review

8.1 Overview

Subsurface conditions along the pipeline corridor were evaluated using the National Cooperative Soil Survey from the USDA Natural Resources Conservation Service (NRCS). The available data has analysis of the top few layers of soil, which extends 60-80 inches below the surface in most locations.

The soil conditions were found to be favorable for conventional pipeline construction, at the assumed minimum pipeline depth of cover of 4 feet. The majority of the corridor is made up of various combinations of silt, sand, clay, and loam. Little to no rock is expected in the open cut sections – assumed 5% of the length.

8.2 Major Crossings

A thorough geotechnical investigation is critical for the major crossings listed in Section 7.5. This investigation should include at least two soil bores at each major HDD, as well as additional soil bores at strategic locations along the pipeline route to give the contractor a full understanding of anticipated subsurface conditions. The soil bores for HDD designs should reach a depth greater than the expected HDD depth and should core through rock, if encountered.

For each of the HDD crossings, bedrock is assumed to be encountered 75% of the time. For each of the conventional bores, bedrock is assumed to be encountered 50% of the time including in the bell holes at each end of the operation.

9.0 Constructability

9.1 Construction Workspace

The location of the pipeline allows for ample workspace through agricultural fields. The standard permanent easement will be 50 feet wide with 50 additional feet to be acquired for TWS. This allows for a total construction ROW width of 100 feet. This width is appropriate for typical mainline construction.

9.2 Qualified Bidders

Based on the size, length, and complexity of the project, ENE recommends limiting the bid list to nationally known, major mainline contractors. For the purpose of this study, ENE was in contact with Holloman, Strike Construction, and U.S. Pipeline. Table 3 shows a list of qualified contractors to be considered for this project.

Name	Location
Holloman	Houston, TX
Strike Construction	The Woodlands, TX
U.S. Pipeline	Houston, TX
Troy Construction	Houston, TX
Price Gregory	Katy, TX
Bobcat	Hillsboro, TX
Lonestar Pipeline	Midland, TX
Driver Pipeline	Dallas, TX

Table 3 – Qualified Bidders

10.0 Risk Analysis

There are different levels of risk associated with each phase of this project. The primary risk is cost escalation due to uncertain market conditions. From a schedule standpoint, the critical path items outlined in Section 3.0 are: survey permission, land acquisition, pipe procurement, and installation.

Risks for land acquisition include public opposition and escalation in land prices. These issues can affect negotiations with landowners for both permanent easement and TWS. If agreements cannot be reached, Xcel may need to exercise eminent domain, which can be time consuming and costly. Public outreach can play a big role in pipeline projects to help reduce public opposition.

Permitting risks vary depending on the type of permit, but environmental permitting will be the most challenging. It is crucial that permit requirements are identified early in the design phase so every possible measure can be taken to adhere to the requirements. Discovery of protected species/habitats and archaeological sites will require immediate attention so the design can be adjusted to avoid or mitigate environmental impacts. Any impacts to US Waters would require an Individual Permit as court ruling has vacated the USACE Nationwide Permit 12; the current design utilizes HDDs and conventional bores for all crossings under US Waters to avoid the need for this extensive permitting.

Risks for procurement are discussed in Sections 4.1 and 4.2. Overall, market sensitivities will play a big role in scheduling procurement milestones.

Design survey, subsurface utility exploration, boundary survey, geotechnical investigations, and environmental surveying are all key parts that are essential for the Engineering Design Phase to progress. These surveys will require effective coordination between Xcel, the design firm, subcontractors, and landowners. If mobilizations are delayed due to reasons such as weather, physical access issues, landowner permissions, access permits, etc., this may have a negative impact on the overall project schedule and subsequent milestones.

Additional risks and opportunities are listed below:

Opportunities:

- Current market conditions appear to be driving pricing down and could provide an opportunity to save on material, installation, and other sub-contractor costs if the project occurs before the market corrects.
- Shipping pipe via rail is an opportunity to reduce cost.

Risks:

- Budgetary estimates are lower than expected, which is in-line with the current market conditions. Pricing could escalate once the industry rebounds.
- If ROW acquisition for the current route presents issues, a route change could increase the project cost and schedule.
- If MAOP needs to be increased, the pipe wall thickness or grade will need to be increased leading to additional cost for both the pipe and installation.
- If 3rd party supply pipelines have MAOPs that are greater than 1125 psig, OPP will be required to protect the upstream facilities and pipeline. OPP could be achieved by adding control valves or slam-shut valves to the upstream facilities. These additional components will lead to increased material and installation costs.

- Installation contractors were asked to consider the terrain and depth of the conventional bores, but there is a risk of increased cost for installation once detailed drawings are made available for the pipeline bid.

Overall, many of these risks can be mitigated with effective planning and involvement of all project stakeholders. It is imperative that a detailed project schedule, communication plan, RACI Chart[3], change management plan, etc. are created and maintained throughout all phases of the project. This will help identify issues as soon as they arise, and then corrective action can be taken to minimize the total impact.

11.0 Value Engineering

Throughout all phases of the project, Xcel and the design firm will identify opportunities for time and cost savings through efficiencies. Some areas where value engineering can be applied include the following:

11.1 Engineering

The design should include a thorough constructability review of the project. Reroutes should be considered for areas that require costly construction methods or extensive permitting. Some examples include rerouting around environmentally sensitive areas, high-value land, existing infrastructure, or other obstructions. The route established during the FEED study accounted for these concerns but should be verified during detailed design.

The project should utilize previously completed engineering designs from comparable projects, incorporating any Xcel standards.

11.2 Design Survey

It is important to secure landowner permissions along extensive, continuous sections of the pipeline route prior to survey mobilization to eliminate move-arounds and move-backs.

The scope of work for subsurface utility explorations shall be evaluated during the design survey. Level B-D should be performed for all utility crossings, however, Level A (potholing) should be limited to areas where field changes would be difficult.

11.3 Construction

The preparation of a complete and detailed construction Scope of Work will ensure accurate bid pricing and will minimize future change orders. Bidding the project out to multiple pipeline contractors will ensure competitive pricing and provide valuable input including cost-saving recommendations based on local experience and available installation methods.

[3] RACI Chart - matrix used to assign parties who are Responsible, Accountable, Consulted, and Informed

12.0 Environmental and Permitting

12.1 Overview

ENE conducted a preliminary environmental assessment of the 20" Harrington Pipeline by performing a desktop review of base maps for the project area utilizing the most current and available digital imagery.

The scope of research covers the following topics:

- Current and historic site land use
- Topography
- Soils
- Public lands
- Public water supplies, sole source drinking water aquifers, and wellhead protection areas
- EPA Envirofact point locations
- Streams and waterways
- Wetlands
- Regulatory floodway and 100-year floodplain
- Federal/State threatened and endangered species
- National/State cultural resources
- Construction activities that may trigger environmental permitting

12.2 Waterways/Floodplain

The review was based on desktop research only. A Waters of the U.S. on-site field survey should be conducted to determine actual conditions and to identify all potential jurisdictional waters and wetlands.

All wetlands and streams are planned to be crossed via conventional bore or HDD to eliminate the need for an USACE 401/404 permit or individual permit. The utilization of a USACE Nationwide Permit 12 is no longer available, as it is currently held under litigation.

12.3 Threatened/Endangered Species

The Threatened/Endangered Species review was based on desktop research only, a Habitat Assessment Survey should be completed during the Waters of the U.S. Survey since the proposed pipeline corridor may provide potentially suitable habitat for threatened/endangered species. See Attachment H for a preliminary list of Threatened and Endangered Species that may be encountered along the route.

Assessments should be completed in accordance with the Texas Parks & Wildlife Department (TPWD) in concurrence with the US Fish and Wildlife Service (USFWS). The USFWS may require additional species-specific surveys and there may be seasonal restrictions for survey windows for listed species.

12.4 Cultural Resources

A desktop review indicates that no archeological or cultural sites will be impacted along the route. A field survey should be performed to ensure that no historic structures and/or archaeological sites are impacted by the construction of the proposed pipeline. Assessments should be complete in accordance with the Texas Historical Commission (THC) in concurrence with USACE.

12.5 Construction Activities that May Trigger Environmental Permitting

Even without applying for a USACE 401 permit, if hydrotest water is discharged to a surface water (or ground discharge with runoff to a surface water), a permit needs to be acquired through the Railroad Commission of Texas (RRC) and/or through the Texas Commission on Environmental Quality (TCEQ) in concurrence with USACE. Discharging hydrotest water directly to surface can be avoided by sourcing water from and later discharging back to the Harrington Plant; the feasibility of this approach should be confirmed during detailed design.

The State of Texas has deferred to the US EPA for permitting activities associated with the National Discharge Pollution Elimination System (NPDES) Construction General Permit. It is not anticipated that this project will disturb over one (1) acre of land. If it is later determined that water discharge will impact more than one (1) acre, a permit application shall be submitted to the EPA Region 6 office located in Dallas, Texas. The application will need to include a Stormwater Pollution Prevention Plan (SWPPP) and a Notice of Intent (NOI) application. Environmental compliance monitoring during construction will be a requirement of the NPDES permit.

If non-hazardous waste is found during construction, THC shall be notified under Statewide Rule 8.

12.6 Other Construction Activities and Permitting

The RRC requires a T-4 Permit be obtained for operating a pipeline at least two weeks prior to commissioning. The RRC also requires additional permitting for new construction with notice provided at least 30 days prior to the start of construction. The RRC P-5 form must be completed prior to submitting these requests.

Railroad crossings need to be permitted through Union Pacific Railroad along with final crossing drawings. The Texas Department of Transportation (TxDOT) requires permitting for all major road crossings. Potter County may require conditional use permits and should be assessed during detailed design.

ATTACHMENT A
Cost Estimate

TOTAL INSTALLED COST - XCEL HARRINGTON 20" PIPELINE

PROJECT Xcel 20" Harrington Pipeline (22 Miles - 1125 PSIG MAOP) **LOCATION** Potter County, TX **REV** REV 0 - Issued for FEED

BY EN Engineering **DATE** June 12, 2020 **TYPE** FEED Study Estimate (+/- 20%)

LINE NUM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT	COMMENTS
1	**MATERIAL**					
2	**Material**					
3	Line Pipe with FBE Coating (20" X 0.375" W.T.), including Freight	FOOT	110,580	$ 58.00	$ 6,413,640.00	$49/foot + $9/foot shipping
4	Bore Pipe with FBE & ARO Coating (20" X 0.375" W.T.), including Freight	FOOT	2,200	$ 79.00	$ 173,800.00	$68/foot + $11/foot shipping
5	HDD Pipe with FBE & Powercrete Coating (20" X 0.375" W.T.), including Freight	FOOT	6,060	$ 72.00	$ 436,320.00	$62/foot + $10/foot shipping
6	3D 45° Segmentable Fittings	EACH	46	$ 2,000.00	$ 92,000.00	18°<X<45°
7	3D 90° Segmentable Fittings	EACH	12	$ 3,500.00	$ 42,000.00	45°<X<90°
8	Meter (16" ANSI 600)	EACH	3	$ 75,000.00	$ 225,000.00	Budgetary estimate of four-path ultrasonic (2 for receipt stations, 1 for delivery station)
9	Control Valve (16" ANSI 600)	EACH	2	$ 200,000.00	$ 400,000.00	Ball valve, includes actuators,
10	Ball Valve (20" ANSI 600) Motor Operated	EACH	3	$ 42,500.00	$ 127,500.00	1 at launcher, 2 at receiver
11	Ball Valve (20" ANSI 600) Manual Gear Operated	EACH	4	$ 36,000.00	$ 144,000.00	2 mainline blocks, 2 at hot tap
12	Ball Valve (20" ANSI 600) Double-Acting RCV	EACH	2	$ 60,000.00	$ 120,000.00	1 NGPL isolation, 1 EPNG isolation
13	Ball Valve (16" ANSI 600) Motor Operated	EACH	8	$ 28,000.00	$ 224,000.00	1 at launcher, 1 at receiver, 6 at meters, 2 at control valves
14	Ball Valve (10" ANSI 600) Manual Gear Operated	EACH	2	$ 9,000.00	$ 18,000.00	1 at launcher kicker, 1 at receiver kicker
15	Ball Valve (4" ANSI 600) Manual Lever Operated	EACH	8	$ 3,100.00	$ 24,800.00	Vent / Drain / Misc
16	Plug Valve (16" ANSI 600) Motor Operated	EACH	10	$ 33,750.00	$ 337,500.00	6 at meters, 4 at control valves
17	Plug Valve (10" ANSI 600) Manual Gear Operated	EACH	4	$ 11,750.00	$ 47,000.00	Mainline bypass / blowdown
18	Check Valve (20" ANSI 600)	EACH	2	$ 22,000.00	$ 44,000.00	2 at u/s meters
19	Hot Tap Tee	EACH	2	$ 40,000.00	$ 80,000.00	
20	Pig Trap Pipe & Fittings	EACH	2	$ 50,000.00	$ 100,000.00	Flanges, reducers, elbows, pipe, misc small
21	Pig Trap Closure	EACH	2	$ 30,000.00	$ 60,000.00	
22	Meter Station Pipe & Fittings	LS	2	$ 45,000.00	$ 90,000.00	Station PV&F
23	Control Valve Station Pipe & Fittings	LS	1	$ 90,000.00	$ 90,000.00	Station PV&F
24	Pressure Transmitter	EACH	9	$ 3,000.00	$ 27,000.00	
25	Temperature Transmitter	EACH	3	$ 3,500.00	$ 10,500.00	
26	Marker Sign & Post	EACH	115	$ 20.00	$ 2,300.00	1 every 1000 feet
27	RTU / UPS / Solar / Communications	EACH	2	$ 100,000.00	$ 200,000.00	
28	Cathodic Test Station & Foreign Line Bond Box	EACH	19	$ 100.00	$ 1,900.00	
29	DC/Foreign Pipeline Crossing Test Stations	EACH	6	$ 300.00	$ 1,800.00	
30	Rectifier/Groundbed	EACH	1	$ 25,000.00	$ 25,000.00	
31	**Material Subtotal**				**$ 9,558,060.00**	
32	**Tax**					
33	Sales and/or Use Tax	%	8.25%	$ 788,539.95	$ 788,539.95	Amarillo, TX sales tax
34	**Material & Sales Tax Subtotal**				**$ 788,539.95**	
35	**Freight**					
36	Freight for all Non-Pipe Materials	%	6.0%	$ 2,534,300.00	$ 152,058.00	
37	**Freight Subtotal**				**$ 152,058.00**	
38	**TOTAL MATERIAL AND FREIGHT COST**				**$ 10,498,657.95**	

TOTAL INSTALLED COST - XCEL HARRINGTON 20" PIPELINE

PROJECT Xcel 20" Harrington Pipeline (22 Miles - 1125 PSIG MAOP) **LOCATION** Potter County, TX **REV** REV 0 - Issued for FEED

BY EN Engineering **DATE** June 12, 2020 **TYPE** FEED Study Estimate (+/- 20%)

LINE NUM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT	COMMENTS
39	**INSTALLATION CONTRACTORS**					
40	**Pipeline**					
41	Off Load & Transport 20" Pipe to Storage Yard	MILE	22	$ 10,000.00	$ 218,657.20	Offload & Load Truck, Transport (Assume 2 Rail Sidings, Haul Up To 50 Mi. to 2 Pipe Yards)
42	Lay 20" Line Pipe Including Soil Sep., Coating Field Welds & All Tie-Ins	FOOT	115,451	$ 80.00	$ 9,236,080.00	
43	20" HDD (rock conditions) (In Addition to Lay Price)	FOOT	4,545	$ 400.00	$ 1,818,000.00	75% of HDD lengths
44	20" HDD (dirt conditions) (In Addition to Lay Price)	FOOT	1,515	$ 350.00	$ 530,250.00	25% of HDD lengths
45	20" Road Bore (rock conditions) (In Addition to Lay Price)	FOOT	1,100	$ 300.00	$ 330,000.00	50% of Bore Lengths
46	20" Road Bore (dirt conditions) (In Addition to Lay Price)	FOOT	1,100	$ 250.00	$ 275,000.00	50% of Bore Lengths
47	20" Open Cut Roads (dirt conditions)	EACH	41	$ 12,000.00	$ 492,000.00	Lease roads. Includes temp road stone
48	Mobilize to job site	LS	1	$ 250,000.00	$ 250,000.00	Allocated one mobilization
49	Demobilization from job site	LS	1	$ 250,000.00	$ 250,000.00	Allocated one demobilization
50	Foreign Pipeline Crossings	EACH	8	$ 7,000.00	$ 56,000.00	Estimated count
51	Utility Pipeline Crossing	EACH	20	$ 7,000.00	$ 140,000.00	Estimated count
52	PI's Segmentable 20"	EACH	70	$ 5,500.00	$ 385,000.00	2 per HDD, 2 per bore, 1 per direction change >18°
53	PI's Field Bends 20"	EACH	25	$ 3,250.00	$ 81,250.00	1 per direction change <18°
54	Hydro excavation Coordinator	DAYS	9	$ 2,250.00	$ 21,000.00	1 day per 3 crossings on average
55	Hydrostatic Test 20" Pipe	FOOT	115,451	$ 5.00	$ 577,255.00	
56	Dry 20" Pipe to (-)38° F	FOOT	115,451	$ 1.50	$ 173,176.50	
57	Caliper Pig 20" Pipe	FOOT	115,451	$ 1.00	$ 115,451.00	
58	Smart Pig 20" Pipe	LS	1	$ 235,000.00	$ 235,000.00	Tool run, including engineering support and analysis
59	Fabricate and Install 20" Launcher	EACH	1	$ 150,000.00	$ 150,000.00	Based on historic
60	Fabricate and Install 20" Receiver	EACH	1	$ 150,000.00	$ 150,000.00	Based on historic
61	Fabricate and Install 20" Mainline Valve Assembly	EACH	2	$ 100,000.00	$ 200,000.00	Based on historic
62	Degrubbing ROW	ACRE	133	$ 2,500.00	$ 332,500.00	Full ROW - x 50 wide, temporary workspace, temp workspace at bores HDDs
63	Reseeding	ACRE	133	$ 900.00	$ 119,700.00	Full ROW - x 50 wide, temporary workspace, temp workspace at bores HDDs
64	Supply and Install (One Time) Wood Mats [4' x 8" x 16']	EACH	2,500	$ 400.00	$ 1,000,000.00	
65	Supply and Install Sand Bags	EACH	2,886	$ 5.00	$ 14,431.38	2.5% of total pipeline
66	Supply and Install Concrete Set-on Weights	EACH	7	$ 2,300.00	$ 16,100.00	Quantity from open cut pipeline in flood plain
67	Installing Cathodic Test Stations	EACH	19	$ 400.00	$ 7,600.00	Estimated count
68	Installing Pipeline Marker Signs	EACH	115	$ 150.00	$ 17,250.00	1 Per 1000 feet
69	Supply and Installing Straw Bales	EACH	125	$ 25.00	$ 3,125.00	
70	Supply and Install Orange Safety Fence	FOOT	5,773	$ 5.00	$ 28,862.75	5% of total pipeline
71	Silt Fence for Erosion Control	FOOT	5,773	$ 7.00	$ 40,407.85	5% of total pipeline
72	Supply and Installing Geotextile Fabric	SQ. YD.	1389	$ 25.00	$ 34,722.22	(100' x 75' meter station) + (50' x50' x 2 valve sites)
73	Supply and Installing Erosion Control Fabric (Curlex)	SQ. YD.	2187	$ 8.00	$ 17,492.58	100 Sq. Yd. (2 Rolls) Per Mile
74	Extra Depth Ditch - 48" Cover	FOOT	11545	$ 1.50	$ 17,317.65	10% of total pipeline
75	Extra Depth Ditch - 60" Cover	FOOT	5773	$ 3.00	$ 17,317.65	5% of total pipeline
76	Extra Depth Ditch - 72" Cover	FOOT	5773	$ 4.50	$ 25,976.48	5% of total pipeline
77	Rock Trenching	FOOT	5773	$ 7.00	$ 40,407.85	5% of total pipeline

TOTAL INSTALLED COST - XCEL HARRINGTON 20" PIPELINE

PROJECT Xcel 20" Harrington Pipeline (22 Miles - 1125 PSIG MAOP) **LOCATION** Potter County, TX **REV** REV 0 - Issued for FEED

BY EN Engineering **DATE** June 12, 2020 **TYPE** FEED Study Estimate (+/- 20%)

LINE NUM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT	COMMENTS
78	Rock Removal	CY	1000	$ 100.00	$ 100,000.00	Estimated
79	Ditching Padding	FOOT	5773	$ 2.50	$ 14,431.38	5% of total pipeline
80	Class 2 Road Base Caliche, delivered and installed	TON	1500	$ 82.00	$ 123,000.00	Access Road to El Paso Tie-In - 6" cover assumed, 15' wide, 1800' long
81	16' Steel Tube Gate (Single) Installed	EACH	0	$ 1,900.00	$ -	Parcel/fence crossing count
82	16' Steel Tube Gate (Double) Installed	EACH	25	$ 3,000.00	$ 75,000.00	Parcel/fence crossing count
83	Temporary Fence	FOOT	90,000	$ 8.00	$ 720,000.00	2-wire fence for trench cattle protection
84	Safety Fence	FOOT	11,500	$ 5.00	$ 57,500.00	~10% of pipeline
85	**PIPELINE SUBTOTAL**				**$ 18,507,262.47**	
86	**Facility**					
87	**Mechanical**					
88	CSM Mob / Demob	LS	1	$ 50,000.00	$ 50,000.00	
89	Install Receipt Meter Station	LS	2	$ 275,000.00	$ 550,000.00	
90	Install Delivery Meter / Control Valve Station	LS	1	$ 425,000.00	$ 425,000.00	
91	Tie-In Launcher	LS	1	$ 30,000.00	$ 30,000.00	
92	Tie-In Receiver	LS	1	$ 30,000.00	$ 30,000.00	
93	**Mechanical Subtotal**				**$ 1,085,000.00**	
94	**Structural**					
95	Foundations for RTU	EACH	2	$ 20,000.00	$ 40,000.00	
96	Foundations for Meter Piping	EACH	6	$ 5,000.00	$ 30,000.00	
97	Foundations for Control Valve Piping	EACH	8	$ 5,000.00	$ 40,000.00	
98	Rest Blocks	EACH	10	$ 1,000.00	$ 10,000.00	
99	**Structural Subtotal**				**$ 120,000.00**	
100	**Civil**					
101	Grading for Meter Station, including gravel	LS	2	$ 50,000.00	$ 100,000.00	
102	Installation of Fence with Drive Gate(s)	LS	2	$ 10,000.00	$ 20,000.00	Estimated 100' x 75'
103	**Civil Subtotal**				**$ 120,000.00**	
104	**Electrical**					
105	Electrical Mob / Demob	LS	1	$ 10,000.00	$ 10,000.00	
106	Install Ground Bed and Rectifiers	EACH	1	$ 20,000.00	$ 20,000.00	Includes Utility Power Drop
107	Utility / Transformer Installation for Rectifier	EACH	1	$ 15,000.00	$ 15,000.00	
108	Install Remote RTU / Solar / Communication at Meter Station	LS	2	$ 30,000.00	$ 60,000.00	Include Loop-Checks and Commissioning Support
109	Wire and Termination at Meter Station	LS	2	$ 75,000.00	$ 150,000.00	
110	Wire and Termination at Control Valve Station	LS	1	$ 100,000.00	$ 100,000.00	Assuming power and spare instrumentation available at Harrington Plant
111	**Electrical Subtotal**				**$ 355,000.00**	
112	**FACILITY SUBTOTAL**				**$ 1,680,000.00**	
113	**TOTAL INSTALLATION CONTRACTORS COST**				**$ 20,187,262.47**	

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LINE NUM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT	COMMENTS
114	**SURVEY SERVICES**					
115	**Geotechnical**					
116	Geotechnical Surveys (Soil Borings at Major Directional Drills)	EACH	23	$ 5,000.00	$ 115,000.00	2 per HDD, 1 per bore, 1 per facility
117	**Sub-Total Geotechnical**				**$ 115,000.00**	
118	**Preconstruction Survey**					
119	Preliminary Survey	LS	1	$ 40,000.00	$ 40,000.00	
120	Legal Survey	LS	1	$ 35,000.00	$ 35,000.00	
121	Certified Plats	LS	1	$ 20,000.00	$ 20,000.00	
122	Alignment Sheets	LS	1	$ 40,000.00	$ 40,000.00	
123	**Sub-Total Preconstruction Survey**				**$ 135,000.00**	
124	**Construction Survey**					
125	Construction Staking	LS	1	$ 40,000.00	$ 40,000.00	
126	As-Built Survey	LS	1	$ 350,000.00	$ 350,000.00	
127	As-Built Alignment Sheets and Data Delivery	LS	1	$ 20,000.00	$ 20,000.00	
128	**Sub-Total Construction Survey**				**$ 410,000.00**	
129	**Subsurface Utility Exploration (SUE Level A-D)**					
130	Level B-D	EACH	35	$ 700.00	$ 24,500.00	
131	Level A Test Holes	EACH	28	$ 950.00	$ 26,600.00	
132	**Sub-Total Subsurface Utility Exploration**				**$ 51,100.00**	
133	**TOTAL SURVEY SERVICES COST**				**$ 711,100.00**	
134	**RIGHT-OF-WAY**					
135	**Easements & Workspace**					
136	50' Wide Permanent Easement	ROD	7,000	$ 400.00	$ 2,800,000.00	Includes damages (Temporary Workspace and Additional Temporary Workspace)
137	Valve Site Agreements	EACH	2	$ 5,000.00	$ 10,000.00	
138	Rectifier Sites Agreement	EACH	1	$ 5,000.00	$ 5,000.00	Separate easement for surface rights and rectifiers could be up to 1000 ft. from row
139	Facility Site Agreement	EACH	2	$ 10,000.00	$ 20,000.00	2 meter stations (EPNG & NGPL tie-in locaitons)
140	Permanent Access Road Agreement	ROD	110	$ 400.00	$ 44,000.00	1800ft = 110rod. New access road to EPNG tie-in from existing railroad frontage
141	Temporary Workspace for Construction - 100' x 100'	EACH	20	$ 3,000.00	$ 60,000.00	Including HHDs and Bores; TWS and ATWS; Pipe yard
142	Construction Access Roads	ACRE	0	$ 2,500.00	$ -	
143	Easement Recording fees	EACH	32	$ 75.00	$ 2,400.00	Number of parcels pipeline passes through
144	Land Management - Project Management	DAYS	190	$ 630.00	$ 119,700.00	
145	Land Management - Title Specialist/Abstractor	DAYS	160	$ 480.00	$ 76,800.00	
146	Land Management - Sr. Right of Way Agent	DAYS	240	$ 490.00	$ 117,600.00	
147	**Construction Damages Construction Subtotal**				**$ 3,255,500.00**	

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LINE NUM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT	COMMENTS
148	**Permit Fees - Roads and Railroads**					
149	Roads	EACH	2	$ 500.00	$ 1,000.00	1 HWY; 1 paved road(s)
150	Railroads	EACH	1	$ 5,000.00	$ 5,000.00	
151	Survey Permits	EACH	0	$ 1,500.00	$ -	
152	**Permit Fees Subtotal**				**$ 6,000.00**	
153	**TOTAL RIGHT-OF-WAY COST**				**$ 3,261,500.00**	
154	**LEGAL AND PUBLIC AFFAIRS**					
155	Legal Fees	LOT	1	$ 215,000.00	$ 215,000.00	0.5% of TIC
156	Public Affairs Fees	HR	0	$ -	$ -	
157	Public Affairs Expenses - Printing, Travel, Etc.	LOT	0	$ -	$ -	
158	**TOTAL LEGAL AND PUBLIC AFFAIRS COST**				**$ 215,000.00**	
159	**ENVIRONMENTAL**					
160	**Surveys**					
161	WOTUS + T&E Habitat Assessment Survey/Report	LS	1	$ 20,000.00	$ 20,000.00	T&M estimate based on 4 miles/day; 2 man crew; expenses
162	Cultural Resources Pedestrian Survey	LS	1	$ 7,500.00	$ 7,500.00	
163	**Environmental Studies/Survey Subtotal**				**$ 27,500.00**	
164	**Permits**					
165	T&E Coordination	EACH	1	$ 12,000.00	$ 12,000.00	State & Federal Coordination
166	Cultural, Historical, Tribal Coordination	EACH	1	$ 12,000.00	$ 12,000.00	State & Federal Coordination
167	Texas Railroad Commission (Hydrostatic Test Water)	EACH	1	$ 6,000.00	$ 6,000.00	Section 8
168	Texas Railroad Commission (Pipeline & Drill Pits)	EACH	1	$ 12,000.00	$ 12,000.00	T-4 Application
169	US Army Corp of Engineers	EACH	0	$ 25,000.00	$ -	Section 404 Permit
170	US EPA	EACH	0	$ 25,000.00	$ -	Region 6, Section 401 - Water Quality
171	**Environmental Permits Subtotal**				**$ 42,000.00**	
172	**Construction**					
173	Environmental Inspection	DAY	110	$ 1,000.00	$ 110,000.00	NPDES-SWPPP Compliance Monitoring for duration of construction
174	**Construction Subtotal**				**$ 110,000.00**	
175	**Post Construction**					
176	Post-construction monitoring	DAY	18	$ 1,000.00	$ 18,000.00	3 working weeks - ensure site stabilization and permit closeout conditions are met
177	**Post Construction Subtotal**				**$ 18,000.00**	
178	**Project Management**					
179	**Project Management Subtotal**	%	10%	$ 197,500.00	**$ 19,750.00**	
180	**TOTAL ENVIRONMENTAL COST**				**$ 217,250.00**	

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LINE NUM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT	COMMENTS
181	**INSPECTION SERVICES**					
182	**Material Inspection Services**					
183	Pipe Mill	DAYS	12	$ 1,000.00	$ 12,000.00	
184	Coating Mill	DAYS	12	$ 1,000.00	$ 12,000.00	
185	Valves, Hot Bends, Fittings, Etc.	MAN/WEEK	0	$ 6,000.00	$ -	
186	Pipeline Bends / Fittings	MAN/WEEK	0	$ 6,000.00	$ -	
187	PDC Building Inspection	DAYS	2	$ 1,000.00	$ 2,000.00	
188	**Material Inspection Services Subtotal**				**$ 26,000.00**	
189	**Construction Inspection Services**					
190	Construction Manager / Chief Inspector	DAYS	110	$ 1,000.00	$ 110,000.00	One (1) Construction Manager for duration of construction
191	Pipeline Inspectors	DAYS	110	$ 3,000.00	$ 330,000.00	Three (3) Inspectors for duration of pipeline construction
192	Facility Inspector	DAYS	60	$ 1,000.00	$ 60,000.00	One (1) Inspector for duration of facility construction
193	Clerk / Receivables	DAYS	48	$ 1,000.00	$ 48,000.00	For 6 weeks for material receipts and tracking
194	Loadout at Pipe Mill Inspector	LS	0	$ -	$ -	
195	Pipeline NDE	DAYS	100	$ 2,000.00	$ 200,000.00	2-man Crew during duration of pipeline construction
196	**Construction Inspection Services Subtotal**				**$ 748,000.00**	
197	**TOTAL INSPECTION SERVICES COST**				**$ 774,000.00**	
198	**ENGINEERING SERVICES**					
199	**Detailed Engineering**					
200	Project Management	LS	1	$ 98,700.00	$ 98,700.00	
201	Mechanical Engineering / Design	LS	1	$ 230,000.00	$ 230,000.00	
202	Electrical Engineering / Design	LS	1	$ 136,000.00	$ 136,000.00	
203	Structural Engineering / Design	LS	1	$ 38,500.00	$ 38,500.00	
204	Civil Engineering / Design	LS	1	$ 44,200.00	$ 44,200.00	
205	Corrosion Engineering / Design	LS	1	$ 34,400.00	$ 34,400.00	
206	Automation	LS	1	$ 122,000.00	$ 122,000.00	
207	As-Builts Engineering / Design	LS	1	$ 56,300.00	$ 56,300.00	
208	Procurement	LS	1	$ 29,600.00	$ 29,600.00	
209	Project Controls	LS	1	$ 5,200.00	$ 5,200.00	
210	**Detailed Engineering Subtotal**				**$ 794,900.00**	
211	**Construction Support**					
212	Construction Engineering Support (RFI)	WEEK	18	$ 1,000.00	$ 18,000.00	
213	**Construction Support Subtotal**				**$ 18,000.00**	
214	**TOTAL ENGINEERING SERVICES COST**				**$ 812,900.00**	

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215	**COMPANY ADMINISTRATION AND GENERAL**					
216	Xcel Internal Project Support	%	1.25%	$ 36,677,670.42	$ 458,470.88	% of total cost
217	**TOTAL COMPANY ADMINISTRATION AND GENERAL COST**				**$ 458,470.88**	
218	**LINE PACK**					
219	Gas Purge & Pack	MCF	16,000	$ 2.56	$ 41,008.00	Henry Hub for May 2021
220	**TOTAL LINE PACK COST**				**$ 41,008.00**	
221	**CONTINGENCY**					
222	**TOTAL CONTINGENCY**	%	15.00%	$ 37,177,149.30	**$ 5,576,572.40**	
223						
224	**TOTAL PROJECT COST**				**$ 42,753,721.70**	
225	**TOTAL COST PER MILE**	MILE	21.87	**$ 1,955,285.36**	$ 42,753,721.70	
226	**TOTAL COST PER FOOT**	FOOT	115,451	**$ 370.32**	$ 42,753,721.70	

ATTACHMENT B
Comparable Projects