

ADDENDUM NO. 1

To

REQUEST FOR PROPOSAL FOR RFP 2931

The following instructions, conditions and requirements amend the above-referenced Request for Proposal documents. No Bidder's proposal shall be considered complete unless this Addendum No. 1 has been signed by the Bidder and receipt hereof acknowledged by the Bidder.

This Addendum No. 1 consists of one instruction and acknowledgement page (this page) and the revisions and additions listed under Item 1 which follows.

Originally issued solicitation pages which are superseded by this Addendum No. 1 pages may be omitted from the Bidder's proposal document, or, if not, they shall be marked out with a large "X" in black ink. The "X" shall cover the page from corner to corner.

Strikeouts, highlights, shading, or italicized verbiage in the text, marked by a vertical line in the margin on the attached Addendum replacement pages, indicate areas where revisions have been made in corresponding pages of the originally issued Request for Proposal.

ITEM 1. Solicitation Document Pages Included Herewith

A. Revisions:

RFP Satellite Based Vegetation ManagementPg. 5 Revised
RFP Satellite Based Vegetation Management.....Pg. 6 Revised
RFP Satellite Based Vegetation ManagementPg. 7 Revised
RFP Satellite Based Vegetation Management.....Pgs. 22-39 Added

All other RFP/Contract Pages Remain Unchanged

* * * * *

The undersigned Bidder hereby certifies that the information, instructions, and conditions set forth in this Addendum have been incorporated in its proposal and are a part of the Contract Documents.

BIDDER _____

BY _____

TITLE_____

DATE _____



March 11, 2025

RFP # 2931

Satellite Based Vegetation Management RFP

Tri-State Generation and Transmission Association, Inc. (Tri-State) request for bid on the above project in accordance to the enclosed scope of work and documentation needed for the RFP. The package contains the following:

1. Instructions, Conditions and Notices to Bidders.
2. Intention to propose.
3. Scope of Work and Price Bid Form – **Satellite Based Vegetation Management RFP**
4. Tri-State – Contract Offsite Terms and Conditions and associated Consulting Contract Addendum.

In order to preserve transparency in the process and to ensure that all respondents receive equal consideration, bidders must not contact any Tri-State employees or agents of the company in regard to this RFP. All communications are to be conducted through the Contract Administrator. Tri-State makes no commitment to respond to other communications received via telephone, FAX, text messaging or other media. If you have any questions, please contact the corresponding person:

All questions – James Schledewitz at (303) 254-3357 or jschledewitz@tristategt.org.

Sincerely,

James Schledewitz

James Schledewitz
Contract Administrator
Tri-State Generation and Transmission Association, Inc.
1100 West 116th Avenue
Westminster, CO 80234
Main (303) 452-6111
Fax (303) 254-3046

Instructions, Conditions and Notices To Bidders



INSTRUCTIONS, CONDITIONS AND NOTICES TO BIDDERS (“Instructions”)

TRI-STATE GENERATION AND TRANSMISSION ASSOCIATION, INC. (“Tri-State”) is a wholesale electric power generation and transmission cooperative operating on a not-for-profit basis. Tri-State was incorporated under the laws of the State of Colorado in 1952 as a cooperative corporation. Tri-State was formed by its utility members for the purpose of providing wholesale power and transmission services to its utility members for their resale of the power to their retail consumers. Tri-State, together with its utility members, provides power to more than a million electricity consumers across nearly 200,000 square-miles in Colorado, Nebraska, New Mexico and Wyoming.

Tri-State’s mission is to provide its member systems a reliable, affordable, and responsible supply of electricity in accordance with cooperative principles.

In order to preserve transparency in the process and to ensure that all respondents receive fair consideration, bidders must only communicate with Tri-State’s Contract Administrator or such other employees as authorized in these Instructions in regard to this RFP. Do not contact any other Tri-State employees or agents. Tri-State makes no commitment to respond to other communications received via telephone, FAX, text messaging or other media.

1. Site Inspection/Mandatory Pre-Bid Conference:

There will not be a pre-bid meeting scheduled for this project.

Please contact James Schledewitz, Contract Administrator with all questions concerning the RFP process, scope of services and documents at jschledewitz@tristategt.org.

Bidders are required to provide their own personal protective equipment for any site inspection. A bidder may be required to provide a valid government photo ID at security and subject to a security screening. Bidder undertakes a site inspection at its own risk.

2. Manner of Submitting Proposals:

Proposals which are not prepared and submitted in accordance with these Instructions are subject to rejection by Tri-State Generation and Transmission Association, in its sole discretion. **Bidder shall submit its proposal to Tri-State as follows:**

E-mail or Fax – One (1) copy of its proposal – along with the one of the following options – (1) only the pages required to be completed by bidder as stated in these instructions and the bid documents or (2) the entire bid documents including the pages required to be completed by bidder as stated in the bid documents.

Tri-State Generation and Transmission Association, Inc.
Attention: James Schledewitz
Phone: (303) 254-3357
Fax: (303) 254-3046



E-mail Address: jschledewitz@tristategt.org

Bidder shall furnish all information required by the bid documents. Proposals and all supporting instruments must be submitted on the forms furnished by Tri-State and must be delivered as stated above..

3. Withdrawal.

Proposals may be withdrawn, altered, and resubmitted at any time before the date and time set for receiving the proposals. After the proposal due date and time, the proposal may not be withdrawn, altered, or resubmitted without Tri-State's consent.

4. Proposal Confidentiality.

The bidders are cautioned against submitting a proposal in response to this solicitation that contains any restrictions which prohibit disclosure of those elements of the bid relating to quantity, price and delivery terms, or of sufficient information to evaluate the essential nature and type of products. The restrictions of such information may cause the proposal to be rejected. Tri-State does not accept any responsibility for safeguarding confidential or proprietary information that is submitted with a proposal. If confidential or proprietary information is submitted, in no event shall Tri-State, its officers, employees or agents be subject to liability of any kind in connection with the use, public disclosure, or other dissemination of such information. High level project descriptions, bidder's name and bid amounts may be used in materials that become publicly available including on Tri-State's website. If there are any questions, please contact the Contract Administrator at the email noted in this solicitation.

5. Exceptions or Conflicts.

Each bidder shall set forth in its proposal all exceptions or conflicts between the bid documents and bidder's proposal. In case of conflicts not stated, the requirements of the bid documents shall govern. All exceptions shall be specific in nature and referenced to the applicable page number and section, article, paragraph or subparagraph of the bid documents. Conflict notations which make reference to bidder's descriptive information, terms and conditions, price escalation policies, warranties or guarantees, etc., as a whole are rejected.

6. Signatures.

Each bidder shall sign its proposal with his or her usual manual or electronic signature and shall give its full business address. Bidder's name stated on the proposal shall be the exact legal name of the entity. The names and titles of all persons signing should also be typed or printed below the signature.

7. Verbal Statements.

Verbal statements made by bidder at any time regarding quality, quantity or arrangement of the work will not be considered.

8. Bid Bond-N/A

9. Contractor's Bond-N/A.
10. Failure to Furnish Contractor's Bond-N/A.
11. Proposal Acceptance Period

The bidder agrees, if this proposal is accepted by Tri-State within ninety (90) calendar days from the proposal due date, to furnish any or all items/services upon which prices are offered, and performed/delivered at the designated point(s) in the time(s) specified.

12. Specific Proposal Preparation Instructions

The proposal shall also include the following completed and signed, if appropriate, information.

- a. Provide bidder's complete company name and address and the name, title and authority of the person signing the proposal to commit the organization to all of the provisions of the proposal.
- b. Provide pricing for per "Price Bid Form" and specifics to the project.
- c. A statement that the proposal will remain open for acceptance for a period of ninety (90) calendar days after the proposal due date.
- d. Provide a letter stating bidder agrees with the contract terms (part of package) if not, redline the terms with per Section 5. If the awarded bidder has a Master Agreement in place with Tri-State, Tri-State may consider using such as the governing terms and conditions. This does not imply the Master Agreement will be accepted. Review and approval to use an existing Master Agreement is required.
- e. A project plan describing how the project will be successfully executed as well as a project schedule, including Gantt chart, showing project start, milestones, and project completion.
- f. Names and resumes, for Tri-State's review and approval, of bidder's project manager and field team leader(s). Replacement or substitution of these personnel shall not be made without Tri-State's approval.
- g. A summary of anticipated project staffing and copies of representative resumes for other project personnel.
- h. Examples of past similar project work with references.
- i. Bidder shall provide with their proposal a list of the proposed subcontractors and the specifics of the work to be subcontracted. The list must be acceptable to Tri-State prior to subcontractors being allowed on project. The successful bidder shall assume all responsibility for the services performed by the subcontractor(s). [Note: As part of the contract execution process, each subcontractor will be required to certify, in writing, that it will comply with all the contract terms, including without limitation, terms and conditions disclosed in the Tri-State – Contract Offsite Terms and Conditions and associated Consulting Contract Addendum].
- j. Bidder and each subcontractor must have received a Unique Entity ID ("UEI") from the System for Award Management ("SAM.gov"). [Note: Tri-State reserves the right to require Bidder and each subcontractor to complete, and obtain confirmation of, full entity registration from SAM.gov, in addition to obtaining a UEI, in Tri-State's sole discretion as part of its confirmation of compliance with Federal grant requirements].

13. Proposal Due Date and Schedule



Bidder's proposal is due no later **than 10:00 AM, MDT, Tuesday, March 25, 2025**, and should be directed to the address or e-mail stated in item 2 (above) and to the attention of James Schledewitz. All proposals must be received via e-mail or fax no later than the time and date indicated.

Proposals will not be publicly opened or read since the selection process will be determined based upon competitive procurement procedures for proposals as described in this RFP.

14. Intention to Propose

Bidder shall indicate its intention to submit a proposal by completing, signing and returning the attached Intention to Propose form (found below) before the due date.

Intention to Propose Due: March 14, 2025

15. Clarification.

Tri-State, subsequent to the receipt of proposals, may seek clarification from each bidder to resolve any questions related to its proposal.

16. Project Specific Proposal Preparation Instructions-N/A

17. Evaluation of Proposals

Tri-State may conduct such investigations as Tri-State deems necessary to assist in the evaluation of any proposal. In determining the lowest evaluated proposal, Tri-State will consider, in addition to the prices quoted in the proposals, the following:

- a. Information provided by bidder as required herein, including, but not limited to, past experience, resumes for anticipated project staffing, and proposed schedule.
- b. Completion of proposal as required herein (i.e. Deliverables, Approach/Plan).
- c. Bidder's exception to Tri-State's requirements, both in number and in scope, if any.
- d. References, technical support, standardization, quality control, logical process, proximity/on-site and training and documentation.
- e. Use of preferred subcontractors.

These criteria and their weighting are subject to change at the discretion of Tri-State. Evaluation criteria include, but are not limited to, the following:

- i. Relevant Experience/Depth
- ii. Cost
- iii. Overall Proposal
- iv. Approach/Timelines/Schedule
- v. Deliverables
- vi. References
- vii. Additional criteria found in scope of work



Tri-State reserves the right to reject any or all proposals and to waive any part of these Instructions, in its sole discretion. Tri-State reserves the right to consider alternatives outside of this RFP.

Tri-State's acceptance of a proposal will be in the form a written contract signed by a duly authorized representative of Tri-State, and no other act of Tri-State shall constitute the acceptance of a proposal. The acceptance of a proposal shall bind the successful bidder to execute the contract included in the bid documents.

18. Potential Lease of Equipment

In the event the scope of supply includes the bidder providing equipment to be owned by Tri-State, Tri-State may elect to have a third party leasing company ("Leasing Company") purchase the equipment directly from bidder and lease the equipment to Tri-State rather than Tri-State purchasing the equipment directly from the bidder.

In such event, all invoices from the bidder are to show the Leasing Company as the "sold to" party. All warranties and indemnification provided by bidder will be assigned to Tri-State, and bidder by submitting its proposal, agrees to such assignment. In addition any terms related to on-site work included in the purchase order/contract will apply any time bidder is on Tri-State property as if Tri-State were the purchaser of such equipment including, but not limited, indemnification, insurance, safety, and security. Tri-State shall be entitled to all the rights and benefits of such terms.

If Tri-State elects to have a Leasing Company purchase the equipment directly from bidder, the equipment, which is the subject of the purchase order/contract, is to be acquired by Leasing Company for the purpose of leasing it to Tri-State pursuant to the terms of a master lease agreement (the "Lease") between Leasing Company and Tri-State. If a default under the Lease occurs, or if the equipment is not delivered to and accepted by Tri-State as required by the contract/purchase order, Leasing Company may assign all rights and obligations of Leasing Company to Tri-State, and bidder agrees to accept the novation of such assignment and, upon receipt of notice from Leasing Company of such assignment, bidder shall look solely to Tri-State for performance of the obligations of Leasing Company under the purchase order/contract.

Intention to Propose



INTENTION TO PROPOSE

SOLICITATION NUMBER:

Request for Proposal 2931

Satellite Based Vegetation Management RFP

Bid is due on March 25, 2025 at 10:00 a.m.

(check the appropriate box below)

We ☐ **DO** intend to submit a proposal or bid.

We ☐ **DO NOT** intend to submit a proposal or bid for the following reasons:

Please **PRINT** the following information:

Name of Company:

Street Address of Company:

City, State & Zip Code:

Name of Person to Contact:

Company Phone Number:

Company Fax Number:

Cell Phone Number:

E-mail Address:

Company P.O. Box Number

P.O. Box Zip Code:

(Authorized Signature)

(Printed Name and Title)

(Date)

Fax, Mail or E-mail Completed Form to:

Mr. James Schledewitz

Tri-State Generation and Transmission Association, Inc.

1100 West 116th Avenue

Westminster, CO 80234

Phone: 303-254-3357

Fax: 303-254-3046

E-mail: jschledewitz@tristategt.org



Scope of Work and Price Bid Form

SCOPE OF WORK

Tri-State Generation and Transmission Association (Tri-State) is looking for a cost with the following technical specifications:

Tri-State Generation and Transmission Satellite Based Vegetation Management Request for Proposals

RFP Summary

Tri-State Generation and Transmission (Tri-State) is seeking a qualified vendor to provide satellite remote sensing data collection, analysis and visualization services to assess vegetation conditions on approximately 3,000 miles of Tri-State transmission line (T-Line) right-of-way (ROW).

Objective

The primary goal of this project is to support wildfire risk reduction through effective vegetation management. The selected vendor will supply satellite-derived data, analysis and visualizations to help Tri-State staff:

- Assess vegetation encroachment, strike tree potential within and adjacent to Tri-State's transmission line right-of-way.
- Calculate and categorize span level and entire transmission line level vegetation risk.
- Estimate the volume of vegetation requiring removal based on Tri-State's vegetation distance criteria to mitigate wildfire risks.

Contract Details

- **Duration:** Three years
- **Project Start Date (anticipated contract execution):** May 30, 2025
- **Project End Date:** December 30, 2027

This partnership will play a critical role in maintaining the safety and reliability of Tri-State's transmission infrastructure. Vendors with experience in satellite remote sensing, vegetation analysis, and wildfire risk assessment are encouraged to apply.

Tri-State Background Information

Tri-State provides reliable, affordable, and responsible electricity to over one million customers across four Western states. As a nonprofit cooperative, we are governed by the 41 member cooperatives we serve in Colorado, Wyoming, New Mexico, and Nebraska. Our service territory spans approximately 200,000 square miles.

In 2007, Tri-State developed the Transmission Vegetation Management Program (TVMP) (see Appendix X) to establish a standardized approach for assessing vegetation conditions within and adjacent to rights-of-way (ROW) and mitigating incompatible vegetation.

Building on the success of the TVMP, Tri-State launched the Wildfire Mitigation Plan in 2022 to expand efforts in wildfire risk identification and implement comprehensive mitigation strategies.

Tri-State is seeking to enhance its vegetation management planning by developing a comprehensive intelligent vegetation management program. This program will enable the remote identification and categorization of vegetation risks within and adjacent to our transmission line rights-of-way (ROWS).

Project Background Information

The Tri-State G&T Satellite Based Vegetation Management Project aims to provide a more accurate understanding of vegetation conditions across Tri-State's large and diverse service area.

The increasing frequency and severity of wildfires in the Western United States over the past decade highlights the critical need for Tri-State Generation and Transmission to mitigate wildfire ignition risks associated with its transmission system. Key drivers for this effort include reducing wildfire risk, minimizing maintenance costs, preventing service disruptions, and avoiding accidental ignitions. Over the years, Tri-State has invested significant resources into wildfire mitigation planning and improving its understanding of wildfire risks across its 200,000-square-mile service territory. One core strategy involves annual or biannual ground patrols to document vegetation conditions. These patrols focus on:

1. **Encroachment Risk:** Identify and monitor vegetation growing near conductors within the right-of-way (ROW).
2. **Strike Tree Risk:** Identify and monitor trees inside or outside the ROW with the potential to fall into conductors.

Vegetation inspections are conducted by trained Transmission Maintenance staff responsible for maintaining over 5,500 miles of transmission lines across three maintenance regions. Each region faces unique challenges, including varying landscapes, forest types, and wildfire risks. Furthermore, the patrol process presents complexities:

- Patrols are not conducted at consistent intervals due to competing responsibilities.
- Staff expertise in conducting inspections varies.
- Using optical laser range finders to measure vegetation height is a trained skill and can be slow and difficult on uneven terrain under harsh conditions.
- Inconsistent vegetation risk scoring methodology across Tri-State's maintenance regions..

Need for Standardization

To improve data reliability and streamline decision-making, Tri-State seeks to standardize its vegetation data collection processes. The goal is to support operational decisions that mitigate wildfire risks system-wide. An internal evaluation concluded that satellite data and remoted sensed vegetation analysis are effective tools for standardizing data collection, particularly for identifying:

1. Vegetation encroachment within different risk criteria zones based on kV level of the line.
2. Strike tree risks inside and outside the wire zone both on and off ROW.

3. Overall tree health/decline inside and outside the wire zone both on and off ROW

2023 Pilot Project Use Case Study

In 2023, Tri-State conducted a use case study to evaluate advanced remote sensing technologies, including satellite imagery and LiDAR and to determine the best solution for vegetation management across our entire service territory. The study focused on a high-risk transmission line in Northern New Mexico characterized by:

- Extreme topography with steep canyon crossing and serve side slopes.
- High wildfire probability.
- Critical infrastructure, including transmission lines, communication equipment, and substations.

During the pilot, data was collected and displayed in an online viewer. This viewer visualized vegetation polygons, categorized by their distance to conductors using a custom encroachment risk framework:

- Vegetation above minimum clearance was classified as critical risk.
- Vegetation below minimum clearance was categorized using a risk matrix
- At the span level, risk data were summarized to generate a risk ranking for each transmission line span.

Key Deliverables of the 2023 Pilot Project Use Case Study

The pilot project provided the following deliverables:

1. Encroachment Risk Framework for 115kV lines (See Figure 1).
2. Polygon GIS data identifying encroachment risks for vegetation within the ROW (See Figure 2).
3. Span Level Encroachment Risk that is calculated off of encroachment risk tolerances established under the Encroachment Risk Framework. (Figure 3: Span Level Encroachment Risk).
4. Export of GIS polygon data to a GIS Point data that was then imported into Tri-State's already existing GIS Field software for use by field crews. The schema for existing GIS tools are included as Appendix 1 (Vegetation GIS Field Software Schema).
5. A quantitative approach for incompatible vegetation to develop a detailed scope of work for large-scale vegetation removal project requiring third-party contractors.

Figure 1. Encroachment Risk Framework

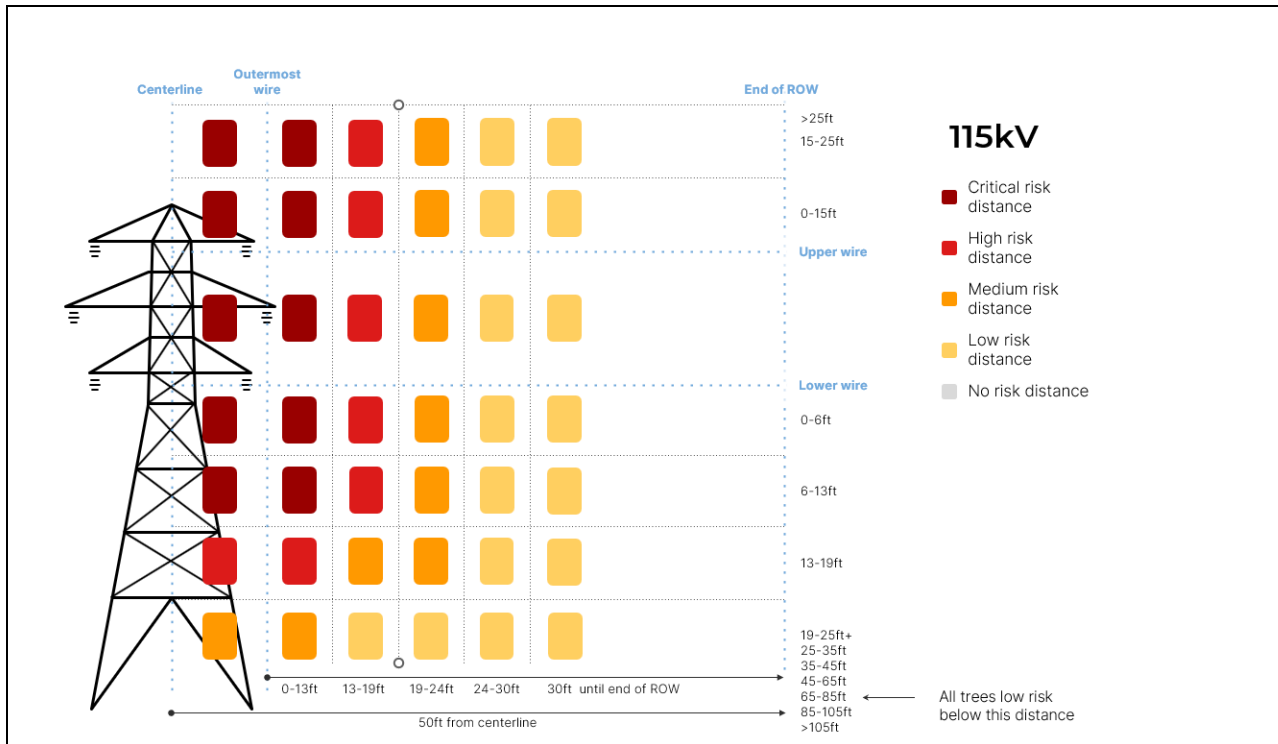


Figure 2. Encroachment Risk Type

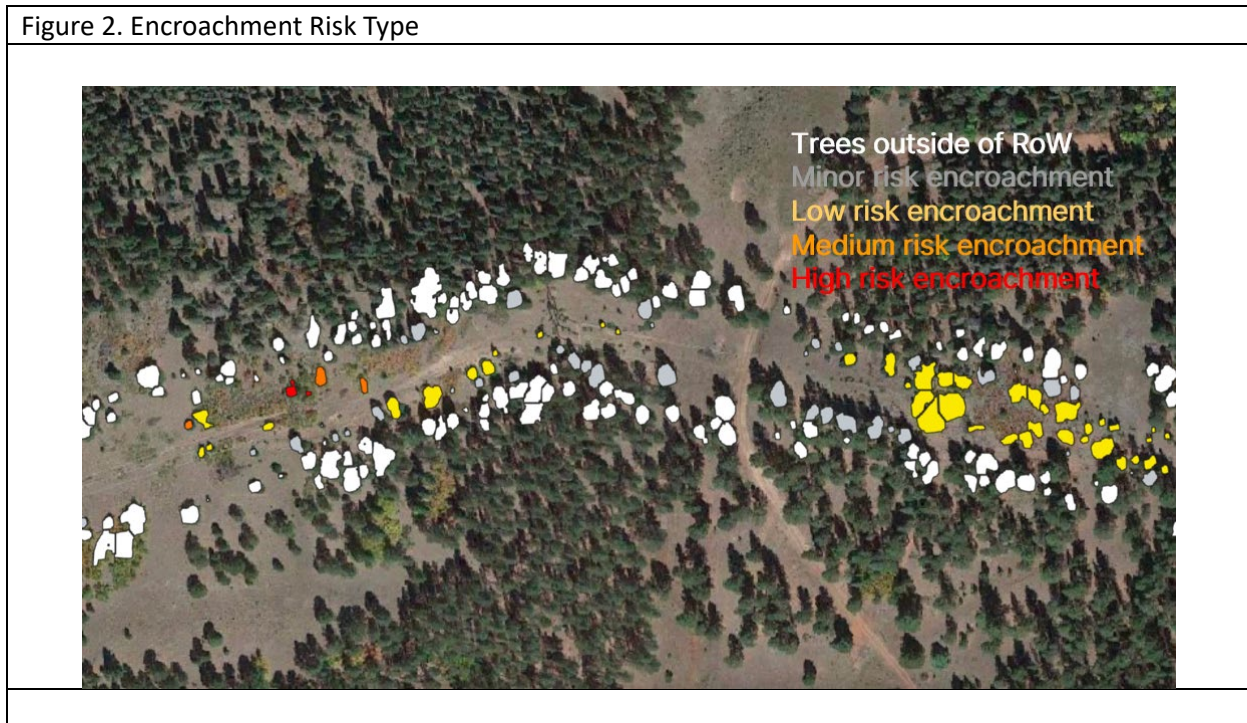


Figure 3. Span Level Encroachment Risk



Project Statement of Work

Project Scope

Tri-State seeks a qualified vendor to conduct satellite remote sensing for vegetation condition assessments across approximately 3,291 miles of transmission line (Tline) over a three-year period. The project will prioritize scanning specific segments annually:

- Year 1: 1,177 miles.
- Year 2: 1,114 miles.
- Year 3: 1,000 miles.

Details about the prioritized transmission line segments, including associated metadata and anticipated scan years, are provided in a GIS shapefile attached to this Request for Proposal (RFP). Upon contract execution, Tri-State will provide the selected vendor with PLS-CADD data or As-built staking sheet drawings for all relevant transmission line segments, along with additional information needed to conduct the assessments.

The vendor shall conduct scans of the right of way plus 50' on either side of the right of way. From the centerline, the voltages and distances of scan are:

Voltage	ROW Width (ft)	Total scan width (ft)
115kV (and under)	100	200
138kV	100	200
230kV	150	250
345kV	200	300

Vendor Responsibilities

Vendors responding to this RFP must demonstrate the ability to complete the following tasks:

Task 1: Develop Satellite Remote Sensing Strategy and Encroachment Risk Framework

The vendor will:

1. Create a 3 Year Satellite Remote Sensing Strategy

- Develop a detailed approach and schedule for satellite data collection with the appropriate data accuracy.
- Use input from meetings with Tri-State staff, provided documentation, prior pilot study findings, and other relevant information.

2. Define an Encroachment Risk Framework

- Develop a framework to calculate vegetation proximity both horizontally and vertically from the conductor to the tree within the Right-of-Way (ROW).
- Develop a framework to assess vegetation strike tree potential both inside and outside the ROW. Outside ROW defined as 50ft each side of existing ROW.
- Develop a separate risk matrix for all relevant Transmission Line voltages: 69kV, 115kV, 138kV, 230kV, and 345kV.
- Define Five Action Levels: Critical, High, Medium, Low, Clear

3. Data Resolution Requirements

- High-resolution scans (minimum 30cm resolution).
- Tri-stereo imagery from forward, nadir, and backward angles.
- Digital terrain maps (minimum 1-meter accuracy).

Task 2: Perform Vegetation Hazard Assessment

The selected vendor will utilize advanced remote sensing technologies to assess vegetation conditions around electric utility infrastructure.

1. Identify Vegetation and Calculate Risks

- Map and classify vegetation within the ROW. Categorize encroachment risks based on height, density and proximity using the Encroachment Risk Framework developed under Task 1.
- Use near-infrared and NDVI (or similar) data to identify dead and declining trees.

- Identify strike trees (trees inside and outside the ROW tall enough to fall onto conductors).

2. Assess Span and Tline Level Risk

- Calculate overall risk scores for each span based on vegetation proximity, both horizontally and vertically and number of potential strike trees. All transmission line spans should be assessed to produce an overall transmission line score based off of findings from Task 2.

Task 3: Utilize an Interactive Dashboard

The vendor will utilize an online, interactive platform that:

- Displays data collected in Task 2, including ground maps, vegetation risks, hazard and strike trees, declining trees and span-level encroachment risks.
- Enable users to visualize horizontal and vertical distances for each identified tree relative to conductors.
- Enable users to visualize vegetation data by Tri-State five action levels.
- Enable users to sort lines by risk score and visualize the scores via a map interface.

Task 4: Provide GIS Data Exports

The vendor will deliver data exports in GIS compatible formats following Tri-State data collection standards. Field names and data schema is provided in the Appendix. The exports must contain:

- Polygon and Point data of all Strike Trees both inside and outside ROW
 - **CLOSEST_SPAN_ID**: Unique identifier of the closest span to each tree.
 - **CLOSEST_SPAN_NAME**: Span name will follow the format: Tri-State TLine facility code and the structure numbers of the 2 structures that make up the endpoints of the respective span.
 - **EST_TREE_HEIGHT_FT**: Tree height in feet.
 - **DIST_FRM_TRUNK_TO_CENTERLINE_FT**: Distance from the tree trunk to the span's centerline in feet.
 - **CLR_BTWN_TREE_CONDUCT_FAIL_FT**: Minimum distance from the tree to the conductor in case of tree failure in feet (negative for shortfalls, positive for strikes).
 - **DIST_FRM_TRUNK_TO_CONDUCT_FT**: Distance between the tree trunk and the outermost conductor in feet.
- Polygon and Point data of all vegetation encroachments identified



- **TREE_ID:** Unique identifier for tree crowns.
- **ACTION_LEVELS_CAT:** Action level as defined in the Encroachment Risk Framework, Action Levels: Critical, High, Medium, Low, Clear assignment to the identified encroachment. .
- **CLOSEST_SPAN_ID:** Unique identifier of the closest span to each tree.
- **CLOSEST_SPAN_NAME:** Span name will follow the format: Tri-State TLine facility code and the structure numbers of the 2 structures that make up the endpoints of the respective span.
- **EST_TREE_HEIGHT_FT:** Tree height in feet.
- **DIST_FRM_TRUNK_TO_CENTERLINE_FT:** Distance from the tree trunk to the span's centerline in feet.
- **CLR_BTWN_TREE_CONDUCT_FT:** Minimum distance from the outermost point of the tree to the outermost conductor in feet.
- **DIST_FRM_TRUNK_TO_CONDUCT_FT:** Distance between the tree trunk and the outermost conductor in feet.
- **SQUARE_FT_VEG:** What is the total square footage of the vegetation.

Task 5: Quality Control

The vendor must adhere to strict quality control measures, including:

1. **Regular Communication:** Hold kickoff and regular progress meetings with Tri-State staff.
2. **Project Milestones:** Submit updates and preliminary results at key completion stages (10%, 50%, 75%, 90%, and 100%).
3. **Sample Validation:**
 - Tri-State will validate the vendor's findings on 55 selected spans on a minimum of 10 different transmission line through in field ground truthing.
 - Ground-based measurements will confirm horizontal and vertical distances and tree health.
 - Data accuracy must be within 15% of ground-based rangefinder values.

Proposal Ranking Criteria

Proposal shall be ranked 0-100 points.

- 10 points: Understanding of the work.
- 10 points: Related project experience (assigned staff and qualifications, previous work completed, references, etc).
- 60 points: Technical approach to accomplishing the work related to Task 1 and Task 2.
 - Description of the proposed remote sensing technologies and methodologies that will be used
 - Data processing and analysis procedures, including software to be used.
- 10 points: Quality control approach.
- 10 points: Dashboarding and data export approach.

Project Schedule

Project Schedule 2025		
Action	Start Date	End Date
RFP Release	March 3	
Proposal Due	March 25	
Proposal Review	March 26	April 9
Interviews (if necessary)*	April 14, 15, 16 10:00/11:00 am central	April 14, 15, 16 10:00/11:00 am central
Vendor Selection	April 18	
Contracting	April 21	May 9
Executed Contract		May 30
Kickoff Meetings/ Project Planning/Dashboard Development	June 1	June 15
Satellite Scans	June 15	August 1
Data Assessment/Dashboard Population	June 15	November 30
Data Exports	November 30	
Annual Summary Report	December 30	
*Vendors are advised to hold these dates/times for interviews as alternatives will not be provided		

Project Schedule 2026, 2027		
Action	Start Date	End Date
Kickoff Meetings and Project Planning/Dashboard Development	April 1	April 15
Satellite Scans	June 15	November 30
Data Assessment/Dashboard Population	June 15	November 30
Data Exports	November 30	
Annual Summary Report	December 30	
Contract End Date		March 31, 2028

Appendix 1 (Vegetation GIS Field Software Schema)

Geodatabase Field Name	Alias	Esri Data Type
Strike Trees		
CLOSEST_SPAN_ID	Closest Span	Text
CLOSEST_SPAN_NAME	Closest Span Name	Text
EST_TREE_HEIGHT_FT	Estimated Tree Height Ft	Double
DIST_FRM_TRUNK_TO_CENTERLINE_FT	Estimated Horizontal Dist From Trunk to Centerline Ft	Double
CLR_BTWN_TREE_CONDUCT_FAIL_FT	Clearance Between Tree and Conductor In Case of Failure Ft	Double
DIST_FRM_TRUNK_TO_CONDUCT_FT	Estimated Horizontal Dist From Trunk to Conductor Ft	Double
Vegetation Encroachments		
TREE_ID	Tree ID	Text
ACTION_LEVELS_CAT	Action Levels Category	Text
CLOSEST_SPAN_ID	Closest Span	Text
CLOSEST_SPAN_NAME	Closest Span Name	Text
EST_TREE_HEIGHT_FT	Estimated Tree Height Ft	Double
DIST_FRM_TRUNK_TO_CENTERLINE_FT	Estimated Horizontal Dist From Trunk to Centerline Ft	Double
CLR_BTWN_TREE_CONDUCT_FT	Clearance Between Tree Ft	Double
DIST_FRM_TRUNK_TO_CONDUCT_FT	Estimated Horizontal Dist From Trunk to Conductor Ft	Double
SQUARE_FT_VEG	Square Ft Vegetation	Double

Tri-State Generation & Transmission Association, Inc.

Transmission Vegetation Management Program (TVMP)

System Integrity and Reliability through a Dedicated Maintenance Team





TRI-STATE

Generation and Transmission
Association, Inc.


A Touchstone Energy® Cooperative



Transmission Vegetation Management Program (TVMP)

Revision 4.5

Vice President Review & Approval

By: 

Name: Keith Carman

Title: Vice President, Transmission Maintenance

Date: December 15, 2023

TRI-STATE GENERATION AND TRANSMISSION ASSOCIATION, INC.
TRANSMISSION VEGETATION MANAGEMENT PROGRAM

Introduction

Tri-State Generation and Transmission Association, Inc., (hereinafter referred to as "Tri-State" or "TSGT") headquartered in Westminster, Colorado, is a consumer-owned, nonprofit, cooperative that supplies wholesale electricity to 42 members. These distribution systems, in turn, serve residences, farms, ranches, small towns, businesses and industries. Tri-State has organized Transmission Maintenance into three geographic areas. Transmission East includes Northeast Colorado, Wyoming, and Nebraska. Transmission West includes West and Southeast Colorado. Transmission South includes New Mexico. Tri-State shall comply with all applicable NERC and Regional Entity Reliability Standard Requirements mandated by FERC, pursuant to section 215 of the Federal Power Act (FPA), 2005.

Disclaimer

These maintenance standards furnished by Tri-State are for internal use only and for informational purposes and the convenience of the Tri-State Cooperative Membership (hereinafter referred to as "Member"). These policies are subject to change from time to time. Any use of this information by the Member, its officers, directors, employees, servants, agents, and successors will be at the Member's risk and without liability or legal exposure to TSGT, its officers, directors, employees, servants, agents, successors and assigns, and Member shall indemnify and hold harmless TSGT, its officers, directors, employees, servants, agents, successors and assigns from all claims, causes of action, damages, losses and expenses including attorneys' fees arising out of or resulting there from which may arise respecting the use of the attached documents by the Member, its officers, directors, employees, servants, agents, successors and assigns.

Table of Contents

1.0 Overview	3
1.1 Objective	3
1.2 Applicable Lines	3
2.0 Vegetation Maintenance	4
2.1 Maintenance Overview	4
2.2 Maintenance Strategy	5
2.3 Vegetation Clearances	6
2.3.1 Vegetation Management Clearances	6
2.3.2 Minimum Vegetation Clearance Distance (MVCD)	7
2.3.3 Potentially Threatening Vegetation Conditions	7
2.4 Maintenance Intervals	7
2.4.1 Vegetation Inspection	7
2.4.2 Vegetation Management	8
2.5 Annual Work Plan	9
2.5.1 Action Thresholds	9
2.5.2 Work Schedule and Verifications	9
2.6 New Construction Vegetation Clearing	9
3.0 Management Constraint Mitigation	10
3.1 Mitigation Areas	10
3.2 Corrective Action	10
3.2.1 Vegetation Management Constraint	10
3.2.2 Potential Risk Constraint	10
4.0 Compliance Reporting	11
5.0 Documentation	11
5.1 File Format and Structure	11
5.2 Data Retention	11
6.0 Transitional Equipment	12
6.1 IROL and Major Transfer Paths	12
6.2 Discovered Equipment	12
6.3 Acquired and Transferred Equipment	12
6.4 Expectations at Time of Acquisition or Transfer	12
6.5 Regulatory Reporting and Mitigation	12
7.0 Maintenance By and For Other Entities	13
7.1 Contractual Agreements	13
7.2 Regulatory Reporting and Mitigation	13
8.0 Compliance Map	14
8.1 FAC-003-4 Supporting Evidence	14
9.0 Revisions	15
9.1 Review Cycles and Responsibilities	15
9.2 Revision History	15

1.0 Overview

1.1 Objective

The objective of the TSGT Transmission Vegetation Management Program (TVMP) is to maintain a reliable electric transmission system by using a defense-in-depth strategy to manage vegetation located on transmission rights of way (ROW) and minimize encroachments from vegetation located adjacent to the ROW, thus preventing the risk of those vegetation-related outages that could lead to cascading. This vegetation management strategy incorporates the following principles:

- Ensure the safe and reliable operation of TSGT transmission system
- Achieve cost efficiency
- Minimize adverse environmental impacts
- Comply with all laws and regulations
- Maintain a harmonious relationship with landowners and the public.

TSGT's TVMP is consistent with the most current version of the North American Electric Reliability Corporation (NERC) Vegetation Management Standard FAC-003. It is TSGT's policy to proactively mitigate vegetation hazards and threats to power system safety and reliability to the extent reasonable and practical within the following main areas of concern:

- Vegetation within the legal control of TSGT: on the Right-of-Way (ROW) and adjacent to the ROW
- Prevention of wildfire on the ROW and adjacent to the ROW with cooperation from landowners and/or land management agencies.

1.2 Applicable Lines

While TSGT strives to maintain all of its line facilities to the same standard, the vegetation management for the following line facilities is specifically governed by this TVMP. The *TSGT FAC-003 Applicable Lines*, located on TSGT's internal Transmission Maintenance page in the TVMP Related Information section, reflects the lines governed by this TVMP.

- Lines identified as elements of a Major Transfer Path, regardless of voltage, as designated by the Western Electricity Coordinating Council (WECC) or Midwest Reliability Organization (MRO);
 - WECC major transfer path elements owned by TSGT are included and designated in the listing.
 - TSGT owned lines have not been designated as MRO critical path elements.
- Lines identified as elements of an Interconnection Reliability Operating Limit (IROL), regardless of voltage, as designated by WECC, MRO or TSGT Transmission Planning;
 - TSGT owned lines have not been identified as IROL elements by WECC, MRO or TSGT.
- All lines rated at 200kV and above.
 - TSGT owned lines within the WECC region are included and designated in the listing.
 - TSGT does not own applicable lines within the MRO region.

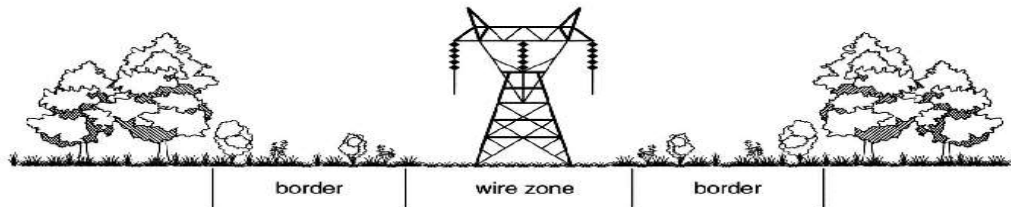
2.0 Vegetation Maintenance

The following practices and procedures are based on TSGT's intimate knowledge and experience of vegetation native to the TSGT service territory. As part of the TSGT training, TSGT line field personnel are provided reference documents ANSI A300 Part 7 (Integrated Vegetation Management a. Electric Utility Rights of-way) as well as the companion publications Part 1 (Best Management Practices - Integrated Vegetation Management and Utility Pruning of Trees).

2.1 Maintenance Overview

It is the philosophy and practice of TSGT's Transmission Maintenance department to manage vegetation on TSGT transmission line ROWs towards a desired condition. The desired condition utilizes the Bramble and Byrnes Wire Zone-Border Zone approach as depicted in [Figure 1](#). In general, the optimum desired condition is one of stable, low growth plant communities, free from noxious or invasive plants, and without an accumulation of large amounts of vegetative debris from vegetation management activities in the wire zone. Low growth plant communities preclude the risks associated with taller vegetation. These communities will typically be comprised of herbaceous plants and low growing shrubs which ideally are native to the local area. Border zone areas will normally be managed for trees that ascend in height with increasing distance from the transmission line. Where trees and other taller vegetation are required on the ROW to meet other environmental objectives, the desired condition shall be to maintain the tree heights to provide the clearances between the vegetation and conductors in accordance with [Table 3](#) and never less than the Minimum Vegetation Clearance Distance (MVCD) in [Table 4](#).

Figure 1: Bramble and Byrnes Wire Zone-Border Zone



Large accumulations of vegetation debris from intensive or repetitive vegetation treatments may require mitigation to reduce risks from wildfire and enhance the fire survivability of the transmission facility. Therefore, a desired condition should also incorporate appropriate fuel management considerations to mitigate wildfire intensity and duration, as well as reduce the potential for fire starts. Consideration is given to removing or mulching large accumulations of biomass on the ROWs rather than leaving material to become a fuel source. Adequate access to each structure and along the ROW is also essential to provide for efficient, cost effective vegetation treatment activities.

In areas adjacent to the ROW, TSGT will cooperate with landowners and land management agencies to collaboratively mitigate risks from hazardous vegetation and wildfire events.

TSGT's transmission system and associated ROWs are made up of many different age classes, land ownership easement and permit requirements, ecological conditions, and other management issues. Consequently, desired conditions will vary and can be specific for each ROW or unique section of ROW. In general, it is TSGT's practice to modify the optimum desired condition to reasonably accommodate other important resource or management issues. However, the safe and reliable operation of the power transmission system will be the primary objective and all other resource and management issues are considered secondary.

Achieving the desired condition on a ROW is a process that may take several iterations over an extended period of time. However, once defined, the desired condition serves as the guide for future vegetation management actions. All subsequent vegetation treatment activities should consistently move toward achieving the desired condition. Once achieved, the desired condition will be proactively maintained by periodic re-treatments.

2.2 Maintenance Strategy

TSGT's TVMP is a comprehensive and integrated vegetation management program utilizing the full extent of TSGT's easements and other legal rights allowed and a variety of management methods. Vegetation management does not occur on a rigid time cycle basis. Rather, the maintenance schedule is driven by the condition of the vegetation found during inspections and the management tool to be applied to trim or remove the vegetation. The vegetation is managed with sufficient frequency to keep the vegetation beyond expected conductor movement and MVCD clearances, [Table 4](#), at all times. Annual inspections of the ROW allow time for fast growth and danger trees to be caught and added into the annual work plan.

TSGT takes into account the inter-relationships between vegetation growth rates, vegetation control methods, and inspection frequency. The level of anticipated tree growth and average mature height, for trees within the TSGT service territory, is indicated in [Table 1](#). TSGT has adopted 1.5 years, maximum, as the inspection and management intervals. Expected conductor movement, MVCD and interval average growth are considered in the clearances left after maintenance in [Table 3](#) to allow for conductor movement and vegetation growth between intervals without encroachment into the MVCD. An additional buffer is included to allow for changes in growth pattern.

An annual work plan is created and closely followed throughout the year to ensure unexpected changes created by weather, work schedules, or land management disputes can be monitored and responded to without allowing encroachment into the MVCD. During the annual inspection cycle, fast growing trees and danger trees are identified and added to the work plan.

Table 1: Tree growth and average mature height

Tree	Average Growth Rate Feet/Year	Induced Growth Rate Feet/Year	Average Mature Height Feet
Ash	1.00	3.0	65
Aspen	1.25	3.0	45
Birch	1.00	2.0	55
Boxelder	1.50	3.0	40
Catalpa	0.80	2.0	45
Cedar	0.70	1.0	45
Cottonwood (Rio Grande)	2.75	5.0	80
Elm (American)	1.50	3.0	80
Elm (Chinese)	2.00	3.5	60
Juniper (Utah)	0.25	0.5	25
Locust (Honey)	0.90	1.5	50
Maple (Norway)	0.60	1.5	45
Maple (Red)	1.00	1.5	45
Maple (Silver)	1.75	4.0	70
Oak (Pin)	0.70	1.5	50
Oak (Scrub)	0.80	1.5	45
Oak (White)	0.70	1.5	65
Pine (White & Red)	1.00	1.0	70
Pine (Piñon)	0.5	1.0	50
Pine (Ponderosa)	1.25	2.0	230
Poplar (Carolina)	2.75	5.0	80
Poplar (Lombardy)	2.50	4.0	65
Poplar (White)	1.25	3.0	50
Spruce (Norway)	1.00	1.0	60
Willow (Black)	2.00	5.0	50

2.3 Vegetation Clearances

2.3.1 Vegetation Management Clearances

The clearance distances to be achieved at the time of transmission vegetation management work are based upon local conditions, conductor movement, anticipated growth and the expected time frame in which TSGT plans to return for future vegetation management work. These clearances assume that transmission lines and their conductors are operating within their Rating. TSGT has developed a table of vegetation management clearances ([Table 3](#)) that establishes the minimum clearance distances to be achieved at the time of vegetation management for the various line voltages and altitudes that TSGT maintains. When trees growing either directly under or adjacent to the line approach the minimum vegetation clearances requiring maintenance specified in [Table 2](#), they are trimmed back to meet the minimum clearance after removal indicated in [Table 3](#). If possible, trees will be cut completely down and removed from the ROW. The landowner is consulted on whether or not to completely cut down or just trim the encroaching tree. In various areas within TSGT's Transmission System the ability to cut down or trim is governed by contracts, ROW easements, or special use permits, especially on government lands.

Table 2: Vegetation Clearance Requiring Management

Line Voltage (kV)	Minimum Clearance (feet between conductor and tree)							
	3000' factor (1.00)	4000' factor (1.02)	5000' factor (1.05)	6000' factor (1.08)	7000' factor (1.11)	8000' factor (1.14)	9000' factor (1.17)	10000' factor (1.20)
34.5	8.50	8.67	8.93	9.18	9.44	9.69	9.95	10.20
69	10.00	10.20	10.50	10.80	11.10	11.40	11.70	12.00
115	10.67	10.88	11.20	11.52	11.84	12.16	12.48	12.80
138	11.33	11.56	11.90	12.24	12.58	12.92	13.26	13.60
230	13.00	13.26	13.65	14.04	14.43	14.82	15.21	15.60
345	15.33	15.64	16.10	16.56	17.02	17.48	17.94	18.40

Distances incorporate IEEE 516-2003 Table 1 and OSHA 29 CFR 1910.269 Table R-10 altitude correction factors.

Table 3: Clearance After Management

Line Voltage (kV)	Minimum Clearance (feet between conductor and tree)							
	3000' factor (1.00)	4000' factor (1.02)	5000' factor (1.05)	6000' factor (1.08)	7000' factor (1.11)	8000' factor (1.14)	9000' factor (1.17)	10000' factor (1.20)
34.5	13.50	13.77	14.18	14.58	14.99	15.39	15.80	16.20
69	15.00	15.30	15.75	16.20	16.65	17.10	17.55	18.00
115	15.67	15.98	16.45	16.92	17.39	17.86	18.33	18.80
138	16.33	16.66	17.15	17.64	18.13	18.62	19.11	19.60
230	18.00	18.36	18.90	19.44	19.98	20.52	21.06	21.60
345	20.33	20.74	21.35	21.96	22.57	23.18	23.79	24.40

Distances allow for conductor movement, MVCD and no less than average vegetation growth for maintenance intervals.

2.3.2 Minimum Vegetation Clearance Distance (MVCD)

The MVCD is a calculated minimum distance to prevent flash-over between conductors and vegetation that is derived from the Gallet Equations. This is a method of calculating a flash over distance that has been used in the design of high voltage transmission lines. Keeping vegetation away from high voltage conductors by this distance will prevent voltage flash-over to the vegetation and transmission outages. [Table 4](#) shows the MVCD for the voltages and altitudes of TSGT applicable transmission lines. If distances between the vegetation and conductor are approaching the MVCD, TSGT will follow the process identified in [section 2.3.3](#) for addressing potentially threatening vegetation conditions.

Table 4: FAC-003-4 Table 2 Minimum Vegetation Clearance Distances (MVCD)

(AC) Nominal System Voltage (KV)	(AC) Maximum System Voltage (kV)	MVCD (feet) 3001 - 4000	MVCD (feet) 4001 - 5000	MVCD (feet) 5001 – 6000	MVCD (feet) 6001 - 7000	MVCD (feet) 7001 - 8000	MVCD (feet) 8001 - 9000	MVCD (feet) 9001 - 10000
345	362	4.6	4.7	4.8	4.9	5	5.1	5.2
230	242	4.3	4.4	4.5	4.6	4.7	4.8	4.9
138	145	2.5	2.5	2.6	2.7	2.7	2.8	2.8
115	121	2	2.1	2.1	2.2	2.2	2.3	2.3
69	72	1.2	1.2	1.2	1.3	1.3	1.3	1.4

2.3.3 Potentially Threatening Vegetation Conditions

When potentially threatening vegetation conditions are confirmed, notification to TSGT Transmission Operations shall be made without any intentional delay. This confirmation could be in the form of TSGT field personnel who personally identify such a threat in the field. Confirmation could also be made by TSGT field personnel evaluating a situation reported by a landowner or contractor. Examples of acceptable unintentional delays may include communication system problems (for example, cellular service or two-way radio disabled), crews located in remote field locations with no communication access, and delays due to severe weather.

Vegetation-related conditions that warrant immediate communication to TSGT Transmission Operations include vegetation that is near or encroaching into the MVCD (a grow-in issue) or vegetation that could fall into the transmission conductor (a fall-in issue).

The TSGT process to ensure the proper communication between field personnel and TSGT Transmission Operations is contained within TSGT's SOP #11, Reports to the Transmission Operator, maintained and documented by the TSGT Transmission Operations department. The Transmission Operator and the field personnel will agree on the appropriate action until, or as, the vegetation threat is relieved. Appropriate actions may include a temporary reduction in the line loading, switching the line out of service, or other preparatory actions in recognition of the increased risk of outage on that circuit.

2.4 Maintenance Intervals

2.4.1 Vegetation Inspection

TSGT shall inspect 100% of the applicable transmission line miles defined in [section 1.2](#). TSGT will, at a minimum, patrol each transmission line facility either by air (helicopter) or by ground at least once per calendar year and with no more than 18 calendar months between inspections on the same ROW. Routine ground patrols are conducted by TSGT transmission line maintenance personnel who are responsible for the oversight and maintenance of the transmission facilities in their respective areas. Routine aerial (helicopter) patrols are conducted under contract by firms that specialize in this type of work. In both cases, any encroachments, including vegetation, are documented and forwarded to the appropriate line supervisor or line foreman for assessment and resolution.

When TSGT is prevented from performing a Vegetation Inspection due to a natural disaster, unexpected weather conditions or system emergencies, TSGT will complete the Vegetation Inspection within the expected calendar year or 18 months, whichever is less, plus the time extension that is equivalent to the duration of the time TSGT was prevented from performing the Vegetation Inspection. Regional line superintendents shall be responsible for approving when an extension to the annual patrol is required. The line superintendents will follow-up with the crew supervisor/foreman to ensure the inspection gets completed within the extension. The schedule changes shall be noted in the annual work plan.

TSGT also considers local conditions that may require additional patrols during the year, such as immediate water supply, local annual rainfall, irrigation, native plant species, and other factors that may alter the normal vegetation growing patterns within each corridor. Constraint mitigation measures, as outlined in [section 3.0](#), and limited ROW width may also alter the frequency of inspections. In addition, aerial or ground inspections may be conducted after an interruption occurrence.

All TSGT transmission line maintenance personnel shall document that they have performed the vegetation inspections identified above. This information shall be retained in the TSGT Transmission Line Database and/or hard copy reports electronically filed in the TSGT Document Management System, as per [section 5.0](#).

2.4.2 Vegetation Management

TSGT completes 100% of its annual vegetation work plan for the applicable lines to ensure no vegetation encroachments occur within the MVCD. TSGT generally executes and completes vegetation management work orders within one year, or sooner depending on the action threshold(s) outlined in [section 2.5.1](#). Potentially threatening vegetation conditions are managed within 24 hours of notification, if it can safely be achieved.

Modifications to the work plan in response to changing conditions or to findings from vegetation inspections may be made (provided they do not allow encroachment of vegetation into the MVCD) and shall be documented in the annual work plan. Acceptable reasons for modification to the annual work plan may include, but are not limited to:

- Crew or contractor availability and mutual assistance agreements
- Identified unanticipated high priority work
- Rescheduling work between growing seasons
- Change in expected growth or decay rate and other environmental factors
- Weather conditions and ROW accessibility
- Delays in obtaining the required permits or permission from landowners and management agencies
- Land ownership changes and changes in land use by the landowner
- Construction changes within or adjacent to the ROW that might affect the execution of the work
- Circumstances that are beyond TSGT's control

2.5 Annual Work Plan

2.5.1 Action Thresholds

Annual transmission vegetation management work plans are developed by TSGT. Utilizing data gathered from line inspections, vegetation management work on specific transmission line ROWs are identified, prioritized and scheduled based on the following action thresholds criteria:

- Confirmation of a potentially threatening vegetation condition ([section 2.3.3](#))
- Criticality of the line, based on Major Transfer Path, IROL or other TSGT criteria, [section 1.2](#)
- Proximity to MVCD ([Table 4](#))
- Level of anticipated growth based on tree growth and average mature height ([Table 1](#))
 - Vegetation type, amount, and height
 - Local growing conditions such as water availability (rainfall or irrigation)
- Proximity to minimum vegetation clearances requiring maintenance ([Table 2](#))

2.5.2 Work Schedule and Verifications

The line supervisor or line foreman that receives the reports generated during the routine ground or aerial Vegetation Inspections described above will assess the information contained in the reports and prepare corrective maintenance work orders, or work order tasks within the TSGT Work Management System. The vegetation management methods used, such as manual clearing, or mechanical clearing, or other actions, will be described in the TSGT Vegetation Management Work Plan. The required corrective vegetation management work that needs to be completed will then be scheduled. These plans and work schedules shall take into account the time required to obtain permissions or permits from landowners, land management agencies, or regulatory authorities. It is TSGT's practice to complete required vegetation management work and close the respective corrective maintenance work orders, or work order tasks within the same calendar year that the encroachment was reported. These work orders will remain in effect until the vegetation encroachment is removed. Foremen and superintendents periodically monitor open work orders to confirm they are closed in a timely manner. The same procedure is followed whether TSGT line crews or contractors complete the vegetation management. This process is illustrated in the *TSGT Vegetation Management Scheduling and Quality Inspections Process* flow chart located on TSGT's internal intranet Transmission Maintenance page in the TVMP Related Information section.

Documentation that TSGT has implemented an annual Vegetation Management Work Plan is retained in the TSGT Work Management System and/or the TSGT Document Management System as per [section 5.0](#). All TSGT transmission line maintenance personnel shall document corrective action taken to remain in compliance with the vegetation management clearance distances identified in [Table 2](#), [Table 3](#), and [Table 4](#). This information shall be retained in TSGT's Work Management System and Transmission Line Database.

2.6 New Construction Vegetation Clearing

TSGT secures transmission line and associated access road ROW by obtaining easements/permits from property owners or land management agencies prior to the construction of new transmission lines. It is TSGT's goal to obtain with these easements/permits the rights necessary to cut down, trim and/or otherwise control all woody stem vegetation necessary for the safe reliable construction, operation and maintenance of the transmission line. Initial ROW clearing work is accomplished by contract vegetation management crews either immediately before or during the construction of any new transmission line. The work accomplished by this initial clearing will establish the desired vegetation profile to be maintained by future vegetation maintenance. New construction vegetation clearing will follow the procedures and guidelines outlined in this TVMP.

3.0 Management Constraint Mitigation

3.1 Mitigation Areas

TSGT has developed corrective actions to achieve sufficient clearances for the protection of the transmission facilities when TSGT identifies locations on the ROW where TSGT is constrained from attaining the clearances in [section 2.3](#). Constraints to performing vegetation maintenance work as planned include, but are not limited to: legal injunctions filed by property owners; the discovery of easement stipulations which limit TSGT's rights; federal, state or local rules and regulations; easements; land owner challenges; and previous TSGT written agreements, as well as special circumstance areas. Locations where vegetation cannot be managed as planned are identified as mitigation areas. These areas shall be included in the mitigation list and be defined by span location, reason for mitigation and mitigation action plan. Mitigation action plans are created specifically for each mitigation area to address unique conditions of the vegetation and its environment. The mitigation list is included as part of the annual plan. The process to address mitigation areas is illustrated in the *TSGT Landowner Refusal Process* located on TSGT's internal intranet Transmission Maintenance page in the TVMP Related Information section.

3.2 Corrective Action

TSGT defines a corrective action as the implementation of a mitigation action plan in order to achieve sufficient clearances for the protection of the transmission facilities. The specific actions taken as corrective actions will be documented and tracked for the mitigation area. Reports on vegetation management and mitigation are continuously available to management for monitoring purposes.

3.2.1 Vegetation Management Constraint

When TSGT identifies locations where performing planned vegetation maintenance work is constrained, but the transmission line is not at potential risk and the work event can be rescheduled, or re-planned using an alternate work methodology or interval, TSGT line crew will coordinate with TSGT Land Rights and take at least one of the following actions to ensure the reliability of the system:

- Work with landowners to purchase trees that are in TSGT ROW. This purchase is done with the understanding that TSGT will completely remove the trees and the landowner will never plant trees in the ROW.
- Work with landowners to allow pruning to a minimum of one and a half year average re-growth.
- Coordinate with local law enforcement agencies.
- Modify the inspection and/or maintenance intervals until mitigation is resolved.

3.2.2 Potential Risk Constraint

When TSGT identifies locations where performing planned vegetation maintenance work is constrained, which potentially leaves the transmission line at risk, TSGT line crew will follow the vegetation management constraint corrective actions indicated in [section 3.2.1](#) and coordinate with TSGT Transmission Operations, as per [section 2.3.3](#), to take at least one of the following additional actions to ensure the reliability of the system:

- Limit the loading on the transmission line
- Take the line out of service

4.0 Compliance Reporting

TSGT will submit a quarterly report to WECC identifying all Sustained Outages of applicable lines, operated within their Rating and all Rated Electrical Operating Conditions, as determined by TSGT, to have been caused by vegetation. Reports will include, as a minimum, the following:

- name of the circuit(s), the date, time and duration of the outage; the voltage of the circuit;
- a description of the cause of the outage; the category associated with the Sustained Outage;
- other pertinent comments; and any countermeasures taken by TSGT.

A Sustained Outage is to be categorized, as per NERC, as one of the following:

- Category 1A - Grow-ins: Sustained Outages caused by vegetation growing into applicable lines, that are identified as an element of an IROL or Major WECC Transfer Path, by vegetation inside and/or outside of the ROW;
- Category 1B - Grow-ins: Sustained Outages caused by vegetation growing into applicable lines, but are not identified as an element of an IROL or Major WECC Transfer Path, by vegetation inside and/or outside of the ROW;
- Category 2A - Fall-ins: Sustained Outages caused by vegetation falling into applicable lines that are identified as an element of an IROL or Major WECC Transfer Path, from within the ROW;
- Category 2B - Fall-ins: Sustained Outages caused by vegetation falling into applicable lines, but are not identified as an element of an IROL or Major WECC Transfer Path, from within the ROW;
- Category 3 - Fall-ins: Sustained Outages caused by vegetation falling into applicable lines from outside the ROW;
- Category 4A - Blowing together: Sustained Outages caused by vegetation and applicable lines that are identified as an element of an IROL or Major WECC Transfer Path, blowing together from within the ROW.
- Category 4B - Blowing together: Sustained Outages caused by vegetation and applicable lines, but are not identified as an element of an IROL or Major WECC Transfer Path, blowing together from within the ROW.

5.0 Documentation

5.1 File Format and Structure

All test results not stored within the TSGT Line Database will be saved into the TSGT Document Management System using the appropriate filename structure and location. Maintenance documents may be saved in word, excel, **pdf** or other scanning formats. Ensure inspection and vegetation management dates are correct, all appropriate boxes are checked, all required fields are completed and Comments are included, if needed, within the TSGT Line Database prior to closing the maintenance work order.

5.2 Data Retention

Documentation required by FAC-003 will be retained as follows, or as otherwise dictated by current standards:

- 3 months for voice recordings
- 12 months for transmission operation logs
- 3 years for all other documentation required by FAC-003-4

6.0 Transitional Equipment

6.1 IROL and Major Transfer Paths

A line operated below 200kV that is newly designated as either an element of an IROL, or an element of a Major Transfer Path will be inspected and have vegetation concerns address by the later of: 1) twelve (12) months after the date it is initially designated as being an element of an IROL or an element of a Major Transfer Path, or 2) January 1 of the planning year when the line is forecast to become an element of an IROL or an element of a Major WECC Transfer Path.

6.2 Discovered Equipment

When line facilities previously unknown to TSGT, or newly identified as regulated, are identified, they are placed into the maintenance schedule and patrolled within six months of discovery.

6.3 Acquired and Transferred Equipment

All transfers of ownership or maintenance responsibilities are governed by approved TSGT legal contracts or agreements. All acquired line facilities rated at 200kV or above, or are designated elements of an existing IROL or existing Major Transfer Path regardless of voltage, will be inspected and have vegetation concerns addressed within twelve (12) months of the close date of the acquisition agreement.

6.4 Expectations at Time of Acquisition or Transfer

1. Facility has been in service.
2. Facility has been maintained to a different standard than that of TSGT.
3. Maintenance activities will be up to date and to the transferring entities standards.

6.5 Regulatory Reporting and Mitigation

In the event that maintenance records do not provide the needed information, at a minimum last maintenance date and supporting documentation, or it is found that the transferring entity's maintenance activities are not current, TSGT will incorporate the transmission line facility into the existing TSGT Transmission Maintenance priorities and:

1. Schedule and complete vegetation inspection and, as needed, management not to exceed twelve (12) months.
2. File a mitigation plan with the appropriate regulatory agency within six months of transfer, if it is determined that the facility cannot be inspected and managed within twelve (12) months.
3. TSGT shall not assume liability for regulatory fines for the newly acquired facility unless it does not meet the requirements within this section. TSGT's liability for regulatory maintenance requirements will be from time of ownership forward.

7.0 Maintenance By and For Other Entities

7.1 Contractual Agreements

All jointly-owned and/or shared maintenance responsibilities are governed by approved TSGT legal contracts or agreements. Most established agreements hold that the maintenance entity will maintain the contractual equipment to their own maintenance program. Transmission lines may be separated by line segment based on ownership and maintenance responsibilities within a transmission line facility.

7.2 Regulatory Reporting and Mitigation

When not specified by legal contracts or agreements, TSGT Transmission Maintenance will meet regulatory requirements by observing and expecting the following:

1. Equipment jointly owned
 - a. The maintaining entity will supply maintenance information to the owning entities, as required by contract.
 - b. The maintaining entity will report all maintenance activities for regulated equipment to the appropriate regulatory agency.
 - c. The maintaining entity will file all regulatory mitigation reports, as needed, to the appropriate regulatory agency. The maintaining entity will notify the owning entity immediately upon identifying the need and prior to filing the mitigation report.
2. Equipment 100% owned by TSGT that is maintained by others
 - a. The maintaining entity will maintain the equipment according to their maintenance program.
 - b. The maintaining entity will maintain the equipment in accordance with applicable regulatory standards for the voltage it is operated at.
 - c. The maintaining entity will supply maintenance information to TSGT upon request and as required by contract.
 - d. Maintenance entities that are not obligated by contract to share the required regulatory information and do not respond to TSGT requests for information are expected to meet regulatory obligations and report the information directly to the appropriate regulatory agency.
3. Equipment 100% owned by others that is maintained by TSGT
 - a. TSGT will maintain the equipment according to this maintenance program.
 - b. TSGT will maintain the equipment in accordance with applicable regulatory standards for the voltage it is operated at.
 - c. TSGT will supply maintenance information to the owning entity upon request and as required by contract.
 - d. TSGT will not report the maintenance to the appropriate regulatory agency unless dictated by contract.

8.0 Compliance Map

8.1 FAC-003-4 Supporting Evidence

R1. Major Transfer Path and IROL elements

- [Section 1.2](#) of the *TVMP* defines the TSGT applicable lines.
- The *TSGT FAC-003 Applicable Lines* reflects the lines, including WECC major transfer paths, governed by this *TVMP*.
- The *TSGT Annual Work Plan* provides inspection and management schedules and completion.
- Quarterly vegetation outage reports provide outage listing, even when no outages occur.

R2. All other applicable lines

- [Section 1.2](#) of the *TVMP* defines the TSGT applicable lines.
- The *TSGT FAC-003 Applicable Lines* reflects the lines governed by this *TVMP*.
- The *TSGT Annual Work Plan* provides inspection and management schedules and completion.
- Quarterly vegetation outage reports provide outage listing, even when no outages occur.

R3. Documented maintenance strategy

3.1 Movement of applicable line conductors under Rating and all Rated Electrical Operating Conditions;
3.2 Inter-relationships between vegetation growth rates, control methods, and inspection frequency

- [Section 2.2](#) of the *TVMP* summarizes the TSGT vegetation maintenance strategy.
- [Section 2](#), all sections, of the *TVMP* details the strategy.

R4. Control center notification

- [Section 2.3.3](#) of the *TVMP* summarizes the TSGT procedure for notification to the control center for potentially threatening vegetation conditions.

R5. Constraint mitigation

- [Section 3.0](#) of the *TVMP* summarizes the TSGT mitigation action where vegetation management is constrained.
- [Section 3.2.1](#) and [3.2.2](#) of the *TVMP* provide corrective actions for potentially threatening vegetation conditions.
- The *TSGT Landowner Refusal Process* provides a flowchart for this process.

R6. 100% Vegetation Inspections

- [Section 2.4.1](#) of the *TVMP* defines the vegetation inspection intervals and expected completion.
- The *TSGT Annual Work Plan* records the inspections scheduled and completed.

R7. 100% vegetation management

- [Section 2.4.2](#) of the *TVMP* defines the vegetation management intervals and expected completion.
- The *TSGT Annual Work Plan* records the vegetation work scheduled and completed.

9.0 Revisions

9.1 Review Cycles and Responsibilities

It shall be the responsibility of all Transmission field personnel to adhere to the practices as outlined in this TVMP. It shall be the responsibility of the regional line maintenance superintendents, to review and approve the program to ensure maintenance, system reliability, personnel safety and regulatory needs are met in a timely manner. Approved revisions will be posted to the departmental intranet page immediately following agreement and submittal by the three regional superintendents with their managers' approvals. Regional and senior managers shall review and approve the program every calendar year. Revisions of the TVMP will be maintained for a minimum of five calendar years, or as otherwise required by state or federal regulations.

9.2 Revision History

Rev No.	Section	Revision Description	Effective Date
--		Base document in section V of Line Standards manual	05/31/07
--	VIII	Added Acquired Equipment	07/19/08
--		Added Revision Request Form	09/16/08
2.0	V Intro, I, VIII	Replaced Responsibility and Authority with Document Control section. Moved Revision Request Form to this section Revised Vegetation Management Program Added statements to support regulatory requirements	04/30/09
2.1	V	Reorganized section, added IEEE table 5, to better support regulatory audits.	07/23/09
2.2	C B, D	Changed Document Control Retention Period from 3 years to 5 years to match TVMP section and FAC-003-1 requirements. Changed management review description and authorities to follow Joel Bladow's Delegation of Authority for Maintenance Standards. Removed specific names.	02/04/10
2.3	IV.A. IV.B,C,D VI, VIII IX, IX.G.	Added six month extension Added clarifying statements. Rewrote Mitigation and Annual Plan Removed specific software references and added reference to SO #3 Changed Document Control section and moved Revision Request Form to external Related Information	03/11/11
3.0	All	Extracted section V (TVMP) and associated information from the Line Standards manual into this separate document Added clarifying statements in response to Forum Peer Review	06/06/11
3.1	8.0 10, 11	Removed Standing Order #3 reference. Rewrote to unify sections within all TM standards.	02/15/12
4.0	all	Reorganize and strengthen information to align with FAC-003-3.	07/01/14
4.1	2.3 7.0	Revised Table 3. Added clarifying statements.	02/02/15
4.2	2.3.2	Revised Table 4. Adjusted MVCD values per FAC-003-4; tables updated to mirror the adjustments made in to the Annual Work Plan in June 2016.	12/21/2016

Rev No.	Section	Revision Description	Effective Date
4.3	TOC	Updated formatting of table of contents	1/22/2020
	Intro	Updated number of members	
4.3.1	Intro	Update number of members language	7/1/2020
4.4	Annual Review	Annual Review. No changes.	12/19/2022
4.5	Annual Review	Annual Review: update revision number.	12-8-2023



TRI-STATE GENERATION AND TRANSMISSION ASSOCIATION, INC.
REQUEST FOR PROPOSAL NO. 2931
"Satellite Based Vegetation Management RFP"

PRICE BID FORM

DESCRIPTION

PRICE

Cost for Task #1	\$ _____
Cost for Task #2	\$ _____
Cost for Task #3	\$ _____
Cost for Task #4	\$ _____
Cost for Task #5	\$ _____
Other Cost***	\$ _____

TOTAL BID PRICE – Time and Material with a Not to Exceed \$ _____

Company Name: _____ Quote/Reference #: _____

Signature: _____ Date: _____

Print name: _____

***** Please provide a detail statement of what is made up of these costs.**

Other Instructions:

1. Bidder can attach their proposal to this "Price Bid Form" as an addition to the cost breakdown stated above.

2. Bidder shall provide current time and material rates (including per diem costs, equipment rental) to this proposal as an attachment. These rates shall govern any additional work identified outside of the original defined scope of work.

Contract Terms and Conditions