Requirements for Boundary Line Marking

**Standard Survey Contract Provisions**

“Contractor/Vendor” shall not interfere with lawful public hunting and trapping activities. No survey activity shall occur on the opening days of small game season, spring and fall turkey season, deer and bear season and the Saturdays associated with these seasons. The Pennsylvania Game Commission “Commission” may limit activities at other times of the year due to management activities, hunting seasons, inclement weather, road conditions or other conflicts.

**Note:** Except on Sundays or for persons using authorized shooting ranges, it is unlawful to be present on State Game Lands (SGL) from November 15 through December 15 inclusive when not engaged in lawful hunting or trapping and fail to wear a minimum of 250 square inches of daylight fluorescent orange colored material on the head, chest and back combined or, in lieu thereof, a hat of the same colored material. Orange colored material must be visible 360 degrees. It is strongly recommended for safety purposes that all individuals operating under the authority of this agreement wear the prescribed orange colored material at all times when accessing the State Game Lands.

“Contractor/Vendor” shall not transport any unauthorized persons behind “Commission” gates or into other areas closed to the public.

“Contractor/Vendor” shall enter SGL from access points deemed most feasible. Unless maintained open by the “Commission”, gates shall be kept closed at all times, except when passing through, and locked when survey activity is not taking place to deter unauthorized access to the State Game Lands. “Contractor/Vendor” shall provide heavy-duty brass four number combination locks (Master Lock No. 175) to the “Commission” to be placed on any gates used for access during the survey period. “Contractor/Vendor” shall leave all gates and accesses in as good or better condition than presently exists. Where gates are closed/locked when entering, they shall remain closed/locked except when passing through during “survey” activities.

“Contractor/Vendor” shall maintain the “Project” site in a clean, orderly and environmentally sensitive manner; all ribbons, paper, trash or other debris shall be properly disposed of and may not be buried on site or on the State Game Lands. Violation of this provision will subject “Contractor/Vendor” to citations and/or fines as provided for in “Commission” regulations. Continued violations will imperil the continuation of the privileges granted and may cause the termination of this contract.

“Contractor/Vendor” shall be responsible for all damages done by their employees or agents to roads, bridges, pipelines, telephone or power lines crossing the designated project area or adjacent thereto, or damage to any other improvements or structures thereon.

“Contractor/Vendor” shall at all times indemnify and save harmless the “Commission” from and against all suits, expenses, damages or claims of any kind whatsoever which “Commission” may suffer, sustain or be subject to either directly or indirectly.

**General Scope of Work:** The scope of work is to clear and blaze when applicable, paint, tag the lines and number corners for the identified Pennsylvania Game Commission (PGC) parcel. All work will be performed in accordance with the Pennsylvania Game Commission Survey Section Specifications, which are outlined in the PGC Boundary Line Marking Specifications Document. All boundaries are predetermined with existing corner markers. A survey plotting of the parcel boundary lines is supplied. Corner number designation along with any other line points and survey control points which will be used in identifying the location of lines to be cut and marked will be supplied. A text file of the coordinate list in the form of a comma delimited ASCII file will be supplied.

**Pre Bid Site Inspection:** A site inspection is encouraged and may be requested prior to submitting of a Final Bid Proposal. This will be coordinated through a PGC surveyor.
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Survey Specifications and Procedures (These are to be used as a guide to perform the services being contracted. At any time additional instructions may be given in order to complete these services as required by the Pennsylvania Game Commission. General requirements, some of which may or may not apply to some or all situations. Any relaxation of these requirements for a specific contract will be furnished in writing by the PGC Survey Section).

A PGC surveyor will be on site for inspection and guidance of work being performed. Methods and Equipment will need to be approved by the PGC surveyor. The PGC surveyor will monitor the work to ensure that the Survey Specifications and Procedures with General Requirements are being followed and fulfilled. The PGC surveyor has the authority to modify the survey specifications and procedures with general requirements as needed to complete the contract to the standards of PGC boundary line marking.

SURVEY SPECIFICATIONS AND PROCEDURES WITH GENERAL REQUIREMENTS

A. Coordination Will be done with the PGC Surveyor as follows. Two weeks prior to starting work notification will be made to arrange a meeting time and place to begin work. By the end of the business day on Thursday the next weeks schedule must be submitted to a PGC surveyor. A PGC surveyor is not required to be on site, this will be at his or her discretion.

B. Hours of work PGC survey staff is not authorized to work over 8 hours per day and 40 hours per week. The contractor/vendor will need to have authorization from the PGC surveyor to work over 8 hours per day and over 40 hours per week.

C. Record Research No Record Research will be required for this work.

D. Adjoining Land Owners Notification Letters Shall be mailed out prior to the start of field work. (see sample adjoiner letter attached, not needed for boundary line marking) Adjoining Land Owner names and address will be supplied by PGC.

E. Standard Survey Provisions Prior to field work the standard survey provisions letter shall be reviewed for compliance. (see provision letter)

F. Field Investigation A field search assisted by PGC survey staff will be arranged at the convenience of the PGC survey staff to identify existing corners and control points needed for line marking work.

G. Measurement Measurements shall be made with instruments and methods capable of attaining the required accuracy of 1 part in 10,000 for closed loop traverses with conventional total stations and ties to GPS control points with an equal degree of accuracy

H. Monumentation (This is not anticipated and if needed a change order may be required) All missing corners, angle points and points of curve on the boundary lines will be monumented, if accessible. If a corner is not accessible, offsets on the boundary line will be set and referenced back to the property corner. For property corners that fall in streams or rivers, the corners on the intersecting beginning and ending lines will be referenced with line pins placed a minimum of ten feet back from the top of bank (not to exceed 50 feet) to such stream. For corners that fall in the cartway of current public roads, line pins will be set on the intersecting boundary lines at an appropriate distance to secure permanence. Line pins so set at streams and roads shall be further witnessed by a six-foot long channel-U steel post (or approved equivalent) provided by the contract surveyor. Corners set otherwise shall have stones placed around, if available, as shown in the enclosed Corner Examples. Any rebar corners set near road cartways, driveways or lawn areas should be set flush to the ground to avoid damage to any tires or equipment. New corner and line pins shall consist of #5 or #6 rebar, minimum 30” in length and long enough to be secure in unstable soil. All new corner or line pins shall be capped with a yellow plastic cap (or substitute approved by the PGC’s Chief of Survey) that contains the registration number or identifying name of the surveyor.

I. Line Cutting All lines will need to be cut and cleared at a minimum width of three (3) feet. No trees two (2”) or greater shall be cut on the adjoining private lands and the contractor will be liable for any such cutting. All brush will be placed on the PGC side of the line being cleared.

J. Boundary Line Marking Boundary lines will be cleared, blazed and painted according to the standards as shown in the examples supplied herein. Marking boundary lines will require blazing and flagging of trees within three or four feet of each side of the boundary line as shown in the attached examples. Blazing shall be done to a sufficient degree to easily distinguish the boundary lines. All corners and line pins used in the final boundary
shall be numbered and shall be so marked, if accessible, in the field according to the standards shown in the enclosed examples. A beginning corner number will be given to the contract surveyor by the Chief of Surveys for the Game Commission and corner and line pins will be numbered as shown on the PGC supplied survey plotting.

K. **Boundary Line “Unmarking”** Any common boundary lines that will become interior lines will need to be “unmarked”. This requires all lines painted white to be repainted black or brown. All PGC boundary tags on these lines will need to be removed. Any posted signs on the new parcel being marked will need to be removed.

L. **Corner Marking** Boundary corners will be cleared, blazed and painted according to the standards as shown in the examples supplied herein. All corners and line pins used in the final boundary shall be numbered on the final plat and shall be so marked, if accessible, in the field according to the standards shown in the enclosed examples. A beginning corner number will be given to the contract surveyor by the Chief of Surveys for the Pennsylvania Game Commission and corner numbers and line pins will be numbered in consecutive order from such beginning point, line pins will be designated to the nearest corner number followed by a letter designation. Any existing State Game Land corner will keep its existing number but the next new-SGL corner will continue with the numbering sequence. Any common boundary lines that will become interior lines will need to be “unmarked” as described in Example 4. All final boundary corners need to be digitally photographed, labeled and saved on a memory stick or DVD for future PGC reference. This must be done after the corners are painted and can be done during the final Boundary Inspection.

M. **Survey Review** The contractor-vendor is to contact a PGC surveyor at any time during the course of the survey regarding any boundary issues discovered that may lead to litigation such as encroachments, unrecorded easements and adverse possession by third parties. The Chief of Surveys or a PGC surveyor will review, if required, such issues in order to speed up the final approval process. Information pertaining to encroachments and other possible litigation issues should be given to a PGC surveyor at first discovery to speed up final survey review.

N. **Boundary Inspection Documentation** A Final Inspection of the boundaries will occur when all work is complete. Boundary Inspection Documentation required for the Final Boundary Inspection to proceed, shall consist of:

1. **Measurements of Boundary Lines** shall be kept so a comparison can be made between the calculated and measured distances on individual lines being marked. Distances of any line pins or reference pins being set shall be documented and reported. All measurements will be referenced to the assigned corner number designations.

2. **Final Plot AutoCAD (.DWG) format (Version 12 or higher)** Will be required to show all lines marked with field measured distances of lines. Distances on lines will specify how they were measured (GPS or Conventional Traverse)

3. **Computer Files** In addition a listing of all the coordinate points used in the survey with their descriptions will be submitted in a standard ASCII File \{P,Y,X,Z,D\}. The final computer files must contain a listing of all the point numbers, point descriptions, corner numbers and coordinates of all work. Elevation data will only be used by PGC if the contract specifically requires it; otherwise, it can be disregarded for final inclusion in any documentation or computer files (left blank in the Ascii format given). Raw data files may be requested by the PGC Surveyor.

4. **Photographs** Are required of all lines and corners taken consecutively and preferably in a clockwise manner. All photographs shall be furnished in a digital (jpeg) File format.

Payment on work completed Will be done by a percent method. Work can be paid at increments of a maximum of 20% and a minimum of 50%. Most calculations will be done as a percent of lineal feet completed. Some cases may require lineal distances to be prorated based on the difficulty of completing remaining lines. This will be at the discretion of a PGC surveyor. Percent of payment will be determined before work is started and will be based on the size of the contract. Over $10,000 (50% or 2 payments), Over $20,000 (25% or 4 payments), Over $30,000 (20% or 5 payments). A working plot will need to be supplied documenting work completed when submitting an invoice for payment.

*Note the following adjoiner letter is not needed for boundary line marking projects. This letter has been mailed out before the initial survey began.*
SAMPLE ADJOINER LETTER

Wednesday, October 03, 2012

Dear Sir or Madam:

The Pennsylvania Game Commission will be performing a boundary survey of the Western Pennsylvania Conservancy tracts to become part of State Game Lands No. 168 located in Plainfield and Bushkill Townships, Northampton County, Pennsylvania. Public Records indicate that your property either adjoins or is in the vicinity of these tracts of land. Our surveyors have begun preliminary work to determine the boundary of this tract.

It is the policy of the Pennsylvania Game Commission to notify adjoining landowners of the presence of our surveyors. We extend this courtesy to you that you may meet with our Surveyor and / or review the final location of the lines and corners, if you desire. If you would like to show us any boundary markers or other objects that you feel would help establish the common boundary, please feel free to contact us to arrange a meeting on the site.

Our surveyors have been instructed to do as little cutting of brush and vegetation as possible while making the survey. During the preliminary work, our surveyors will be placing stakes and colored flagging at instrument stations or points of interest to the survey party. These should not be confused with the actual corner or line monuments marking the common boundary. Any stakes and flagging we use will probably not be placed on the boundary or represent a common corner. When the survey is finished the lines and corners will be permanently marked in accordance with our standard surveying practices.

To ensure a complete and accurate survey, we would appreciate a copy of any unrecorded documents, such as plats, old deeds, survey notes, reports, etc., that you feel would help re-establish any property boundary lines in the vicinity to this tract. We will reimburse you for any reasonable costs.

If you have any questions concerning the survey, please feel free to contact either the Surveyor or our Harrisburg office (see addresses below). Thank you for your cooperation.

Surveyor:  David J. Sarna, P.L.S.
129 North Street
Mountain Top, PA 18707
dsarna@state.pa.us
Phone: (570) 578-0961

Harrisburg Office (Secondary):  PA Game Commission
2001 Elmerton Ave.
Harrisburg, PA 17110-9797
Attn: Frank Miller
Phone: (717) 787-6568
EXAMPLE 1 – BOUNDARY CORNERS

New corners shall be minimum 5/8\textsuperscript{th} inch rebar, 30 inches in length & capped with surveyor or company ID. Stones shall be placed surrounding corners and line pins wherever available and painted white as shown with corner number painted in red at least twice, one visible and one hidden beneath one of the stones. Additional marking of corner number is encouraged. Paint used shall be good quality exterior latex (no spray paint cans).

Existing stone corners are to be firmed solid and drilled with a center hole or ‘X’ mark chiseled. Existing corner trees shall be witnessed minimum of two sides with a line pin on each intersecting line and within 25 feet of the corner. Similar line pins shall be placed at inaccessible corners.
EXAMPLE 2 – BOUNDARY CORNERS

All corners will be referenced to witnessed trees or natural landscape feature by horizontal measurement from its face and bearing stated or shown to nearest cardinal or intercardinal direction (N, S, E, W, NE, SE, SW, NW). Corner referencing stating the type and size of the referenced object shall be kept in a standard survey field book. Referencing can be recorded by using a hand drawn picture or by a clearly written description.

Corners set without nearby witnessed trees such as in Figure B shall either have a natural witnessing feature such as the end of the stone row in Figure A or a steel fence post placed by the corner as shown in Figure B.
Final boundary lines shall be cleared to establish a visible line of sight through all woodland areas. Smaller trees and brush cut for line clearing should be heaped on Game Lands for wildlife. Trees larger than 4” diameter located on line (line trees) may be left in place and double-blazed on both sides in the direction of the line as shown on the conifer tree above. Trees within 3 feet of either side of the boundary line shall be blazed and painted white as shown above. White paint shall be the same as used on the boundary corners and shall be applied heavy enough to anticipate a 5-year life.

Survey crew must respect all property owners and accept responsibility for any tort action resulting from accessing across adjoining land or cutting any adjoiner’s trees. The SURVEYOR must contact the Chief of Surveys for the Game Commission if any adjoining landowner objects to blazing or painting of trees on his side of the boundary line.
Unless stated contrary in the contract, plastic Boundary Tags will be supplied by PGC personnel to be placed at intervals not greater than 500’.

FINAL INSPECTION requires all:
- boundaries cleared & blazed
- painting completed for both new lines & unmarking old boundaries
- ‘boundary inspection’ documentation received before it can be scheduled.

Existing SGL Boundaries forming a part of the contract survey will become interior boundaries and need to be “unmarked.” All such lines and corners that become interior shall be painted over with black or brown flat latex paint & all old Boundary Tags along such lines need to be removed and properly disposed of as part of the survey contract.