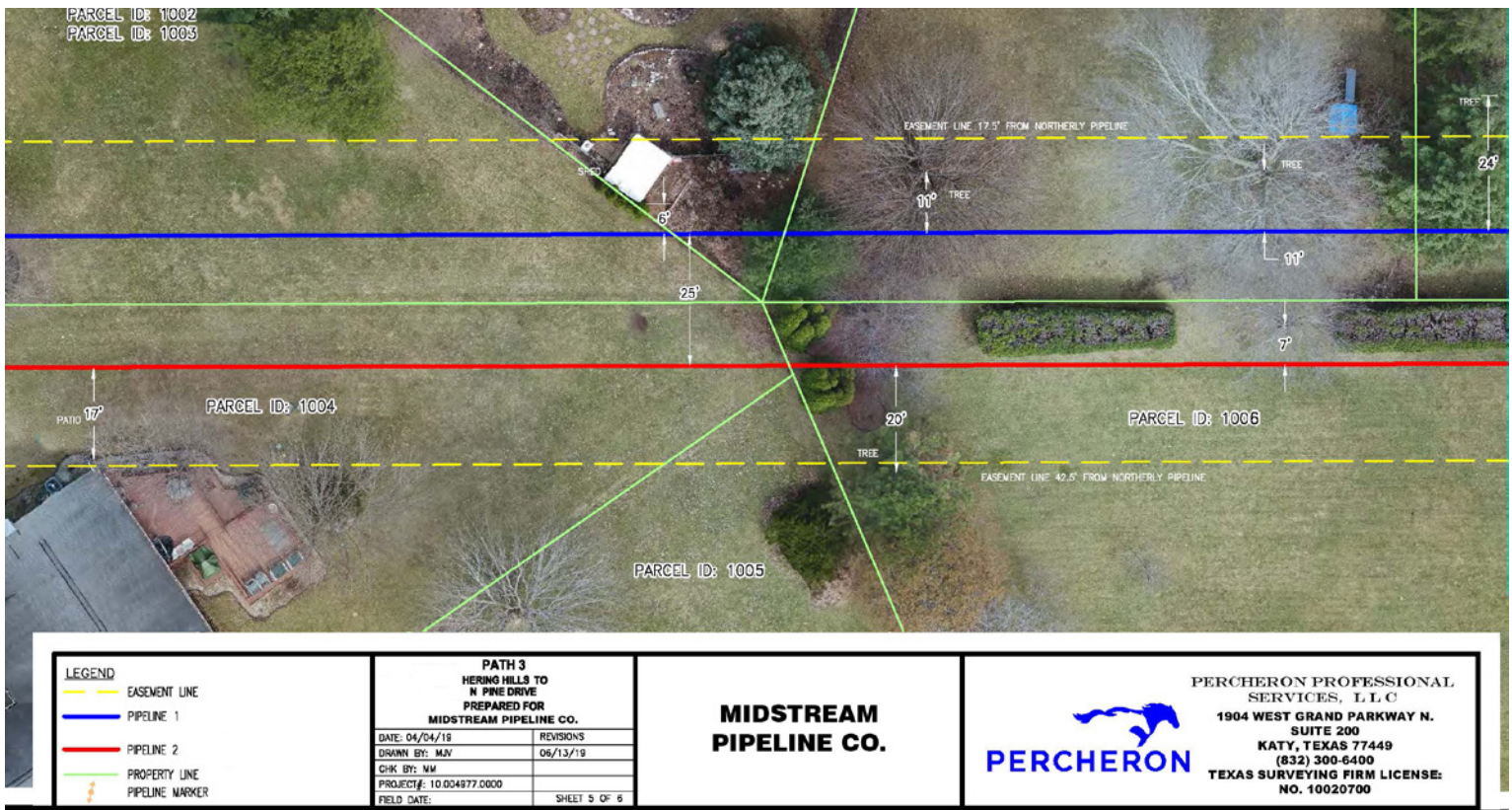


**Right-Of-Way Encroachment Detections & Measurements with Unmanned Aerial Vehicles**



**Through the legal use of UAVs, the Percheron Team identifies vegetation and permanent fixtures that encroach rights-of-ways without physically accessing the property on foot.**

**Scope of Work and Challenges**

Percheron’s Surveying and Aerial Solutions Team was retained to inspect a client’s existing right-of-way for encroachments prior to beginning reclamation within the easement. The client’s goal was to establish a detailed cost analysis plan prior to notifying landowners of the plan to reclaim the easement. As such, the client wanted minimal landowner contact during the inspection and therefore physical access to the easement would not be permitted.

**What We Did**

We electronically located pipelines at public access points and established a grid of Ground Control Points and checked shots on publicly accessible locations in the area surrounding the project. Aerial data was collected via UAV and was processed using photogrammetric and surveying software. The data was analyzed with GIS and CAD drafting tools and compiled into alignment sheets that contained all relevant information.

Upon our completion, the client was much better prepared for reclamation discussions with the landowners by possessing high-definition (“HD”) images of existing easement conditions. Once reclamation is complete, the client will retain Percheron’s Surveying and Aerial Solutions Team to perform an inspection of the reclaimed area to ensure work was performed as required.



## Pipeline Right-of-Way Vegetation Management via Unmanned Aerial Vehicles



**UAVs have the potential to significantly reduce safety risks to personnel, cut operational costs and increase efficiencies to inspect rights-of-ways. Long stretches can be remotely inspected and provide operators with extremely detailed information about existing conditions.**



### Scope of Work and Challenges

One of our clients hired a vegetation management company to clear 24 miles of pipeline right-of-way. Upon completion, and for reasons unknown to Percheron, our client was not satisfied the vendor performed the work as agreed upon. Percheron's Surveying and Aerial Solutions Team was tasked to verify (or disprove) our client's assumption. Physically walking 24 miles of right-of-way in mountainous terrain was not an option due to safety concerns, time schedules, and the need for georeferenced and high-resolution images to provide verification.

### What We Did

Our UAV Team mobilized the equipment and flew all 24 miles in 3 days and found over 50 individual areas that were not cleared as agreed upon by the vegetation management vendor. The uncleared areas were documented by images as well as location. While inspecting the right-of-way for vegetation removal, our UAV Team also identified other areas of concern (not resulting from the vegetation management vendor's lack of performance). These areas included exposed pipelines due to washout or erosion and hunting blinds.

Not only did the aerial inspection save the client money and mitigate safety risks, our deliverables included detailed imagery documentation and coordinates to assist with remediation efforts.