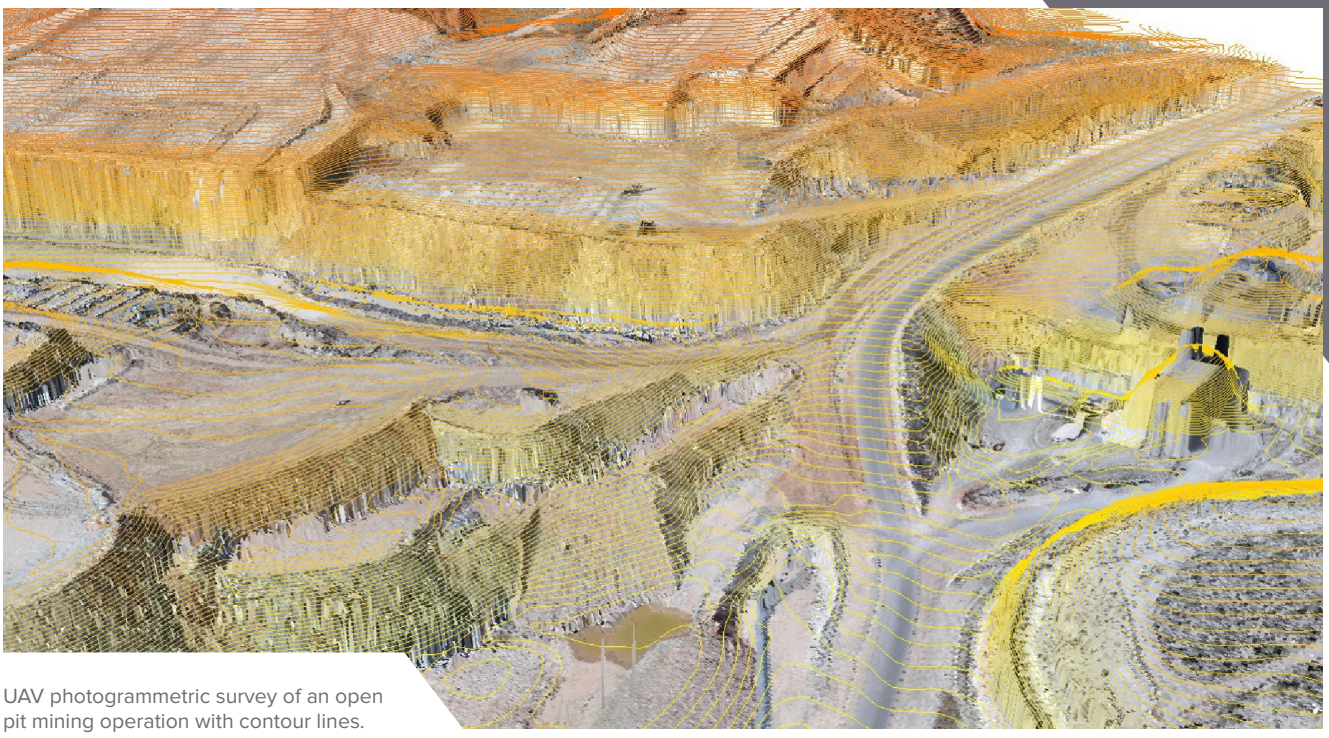

UAV photogrammetric survey of an open pit mining operation with contour lines.

UAS: Are You Sure You Are in Compliance With All the Laws and Regulations?

So your FAA 333 exemption is in place, you've verified that you are well away from an airport, have the permissions in place for proximity to persons or property and are ready to start your project. Are you in compliance with all pertinent laws? You may not be, depending on the type of deliverables you are providing and the US State in which you are working.

I attended a UAV conference a few months ago. I was surprised at the number of land surveyors I encountered there. It seemed like every time I turned around to chat with the person next to me at a workshop or elsewhere, the person was a land surveyor like me. I suppose it shouldn't have been that surprising considering the promise that UAS applications brings to the surveying and mapping field.

During the conference, I also talked with a number of UAS service providers. I became curious to know if any had

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Open-pit quarry with gravel pile quantities.

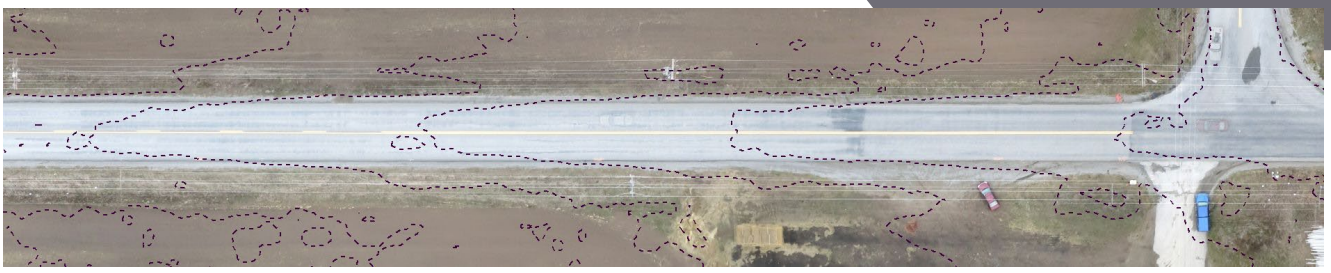
knowledge of US State survey statutes. I was surprised that none were aware that there are State statutes in place that define and regulate the practice of surveying (and the practice of photogrammetry in some States). They were unaware that some of the services and deliverables provided by UAS service providers may fall under the practice of surveying.

In the January/February edition of Lidar Magazine, under the Random Points department, the author discusses the importance of individual and firm qualifications, standardized processes, well designed QC, as well as the appropriateness of utilizing a Professional Land Surveyor (PLS). The topics are covered well and I don't feel the need to add my opinions. I am in wholly in agreement with the importance of qualifications and practicing within your area of competence. I want to focus here on one key aspect that needs to be brought into the conversation.

Are you providing a DTM and imagery that is referenced to the National Spatial Reference System (NSRS)? Are you providing deliverables that are going to be used for quantity measurements or engineering design? Are you stating a positional accuracy that is consistent with engineering and surveying applications or according to some published standard? In many States, providing these deliverables and services is considered the practice of surveying. Many States have similar statutes in place regulating Photogrammetry. In my opinion, it is not a question of whether UAS service providers should be licensed land surveyors. It is a question of whether some UAS practices fall under the practice of surveying as defined by existing State statutes. If so, they must be performed under the direct supervision of a PLS.

Simply put, you may be breaking the law. If so, you can be brought before the State Board for Land Surveying for practicing without a license. You could be ordered to cease and desist, and be subject to fines or more serious legal consequences. If you are using employees to do this work, you may be putting them at risk of legal consequences.

Providing deliverables to be used for GIS, natural resource management, jurisdictional planning purposes, fire control management and any other number of commercial applications not related to mapping are not likely to fall in this category. What if the property owner gives their approval? Well, all projects are on property owned by someone. Just as I cannot come to your house and practice medicine with your permission, I cannot come to your property to practice surveying without a license. What if the property is National Parks, BLM or other federal property? My understanding is that unless you are a federal employee, you



UAV photogrammetric survey of Huetter Road with contours.

are subject to State laws governing the practice of survey.

Yes, there may be some gray areas. Most of the survey statutes were put in place decades ago and did not anticipate the significant advancements in the data collection and mapping technologies of today. However, except for being in an electronic format, the deliverables and services are often largely the same. Whether you are using transits and levels, total stations, GPS or UAS to collect the data and various electronic platforms to produce deliverables, you are still accomplishing essentially the same work. You are just using a different toolset. While we might debate various aspects of this, it is ultimately up to the State Boards who have oversight responsibility. If you have questions about what you are doing in a particular State, I recommend that you contact the State Board directly. Short of that, contact a PLS licensed in the State you are working in.

Please know that I am not writing this to be confrontational. Yes, there are some surveyors who are threatened by UAS, concerned that this is a take-over of their turf. I am not one of them. I believe in using the best tool to achieve the desired results and am excited about the potential for UAS applications in my profession. I only want UAS practitioners to become aware of this situation. I believe that it should be discussed in publications such as this and included as a program module in UAS and LiDAR conventions in much the same way that FAA compliance is.

I am working with a UAS service provider to explore best practices, working UAS into the survey workflow, achieving the project specific accuracy and precision, as well as examining the application and integration of different software. Just as the UAS firm needs to be compliant with FAA regulations, it needs to be compliant with State survey statutes. The firm's employees should not be put at risk of legal consequences. Their clients should not need to question whether or not the firm is violating any laws. In fact, consultant/client contracts often include language requiring compliance with applicable laws.

There will likely be thousands of new UAS service providers entering the industry in the next year or two. State Boards regulating the practice of surveying are not unaware of this. Many are already grappling with the relationship of the changing measurement and mapping technologies to the existing statutes. I have reached out to some colleagues who serve on State Boards for some of the States I hold licenses in. The "unofficial opinion" I hear is that some UAS practices likely overlap with the practice of surveying. Many States are working toward changes to the existing survey statutes to address these and other issues. There may be opportunities to provide meaningful input and shape the outcome. The UAS industry would be well served to be knowledgeable about State survey statutes and be proactive with shaping this aspect of our future. As a professional land surveyor, I am also encouraging my colleagues to be open to change and be involved in the same way.

Rich Waltrip is a Professional Land Surveyor with licenses in Washington, Idaho, Montana and Missouri. He is the owner of Waltrip Geomatics and Geospatial Services, LLC (WGG) in Spokane, Washington and is involved with geospatial data management, as well as geospatial workflow and process improvement. Recent project efforts involve investigating and evaluating the application of Unmanned Aerial Systems on civil/survey projects.