"Cutting Corners"

The State of Alaska Speaks Out

On BLM's

Direct Point Positioning Survey (DPPS)

System

ABSTRACT

Alaska Department of Natural Resources (DNR) will present its perception of DPPS in context with state history and the 3½ year negotiation between the US Bureau of Land Management (BLM) and the DNR. On December 19, 2016, a BLM News Release announced BLM's intentions of unilaterally implementing the DPPS system and effectively terminating this negotiation.

BLM conducted a pilot project covering an area 44 miles by 54 miles in width within the interior of Alaska. Under BLM's Instruction Memorandum, dated September 13, 2016, only the angle points on the exterior boundary of the block are required to be set and DPPS is approved, by BLM, for lands to be conveyed under the Alaska Statehood Act. The BLM's Director Kornze announced plans to implement DPPS nationwide.

DPPS is a re-engagement by BLM of a State/Federal dispute over density of survey monumentation which originated over the first state land entitlement survey approved in 1961. That survey dispute was amicably resolved in 1963 with the state agreeing to 2 mile monumentation around townships.

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On April 20, 2016, The Bureau of Land Management (BLM) presented a four-hour outreach and training session on DPPS and invited public and private sector surveyors across the state to attend in person in Anchorage or by video conference in Fairbanks. Presenting in Anchorage were Alaska BLM survey staff and by video were Don Buhler, BLM National Chief Cadastral Surveyor and Bob Dahl, (editor for the Manual of Surveying Instructions 2009).

DPPS is presented as a new technology, using coordinates as a better alternative to setting monuments to identify corners.

The DNR believes that the key features of DPPS are not new. The discussion on the number of monuments required to be set on Alaska state selection surveys has been addressed thoroughly and settled with the first state entitlement surveys in the early 1960's. The conveyance of land identified by coordinates has also been tried in the 1970's under the 1973 Memorandum of Understanding (1973 MOU). In 1981, after 13.5 million of acres had been conveyed to the state using protraction surveys, the DNR notified the BLM that we would no longer accept title based on protraction surveys.

When I began working for DNR in 1980, Claud Hoffman was the Director of the Division of Technical Services. At statehood, he was a Cadastral Surveyor for the DNR and Maurice Oswald was the Acting Chief Cadastral Engineer as the Territory became a State.

Alaska became a state effective on January 3, 1959.

Selected quotes from the Alaska Statehood Act 6(g):

All selections shall be made in reasonably compact tracts, taking into account the situation and potential uses of the lands involved, and each tract selected shall contain at least five thousand seven hundred and sixty acres unless isolated from other tracts open to selection.

Where any lands desired by the State are unsurveyed at the time of their selection, the Secretary of the Interior shall survey the exterior boundaries of the area requested without any interior subdivision thereof and shall issue a patent for such selected area in terms of the exterior boundary survey.

The First State Land Entitlement Survey

Hobart Hyatt and Jerry Harris Supervisory Cadastral Surveyors executed group 100 survey under special instructions dated June 6, 1960. Survey was approved October 16, 1961, and filed in December of 1961. This survey aggregated seven state selections and surveyed the exterior boundary of the group of selections.

Jan 8, 1962 DNR surveyor Claud Hoffman wrote to Maurice Oswald DNR Acting Chief Cadastral Engineer: This survey "leaves quite a burden upon the State". Followed by "Objections to survey Group 100" on Jan 10, 1962.

Questionable Points Raised by the State of Alaska – Group 100 Survey: "We are quite disappointed that the manual of Surveying Instructions was not followed...the most important single exception to this survey is that, if intended to be used to pass title to the state, it does not comply with (the Statehood Act) ...since this particular area has been covered by eight separate selection applications which were accepted and approved..."

On Feb 6, 1962 Roscoe Bell, Director Div. of Lands wrote to Senator Bartlett "...the first plat received from BLM on a state selection survey leaves a great deal to be desired." "The Statehood Act requires the survey of the exterior boundaries of selections...however, the survey covers several selections and does not mark the boundaries of the individual selections, rather, it provides monumentation at irregular intervals on the boundary of a four township block.

On Feb 26, 1962 Senator Bartlett wrote to Director Roscoe Bell "The Bureau does not seem at all interested in expanding the extent of surveying...Obviously something must be done to correct this..."

On March 13, 1962, Senator Bartlett testified before the Subcommittee on DOI Appropriations. The issue was discussed in detail.

Meanwhile, the issue was also addressed by the Dept. of Interior. Quoted from the DNR Div. of Lands Annual Report – 1963, page 4: "The special Alaska Railroad car, "Caribou Creek," was the scene of an important conference held in the summer of 1963 between state and federal officials. Occasioned by the Alaskan visit of Assistant Secretary of the Interior John Carver, the conference included Carver, Commissioner Phil Holdsworth of DNR, Director Roscoe E. Bell of the Division of Lands, Roger Robinson, state director of the BLM and others. While the Caribou Creek car made a two-day tour of the rail belt area, from Fairbanks to Anchorage, the conference was able to progress without outside interruption, and major policy decisions were made which have cleared away the main obstructions to the passage of title to State-selected lands."

On August 19, 1963 John Carver, DOI wrote to Phil Holdsworth, DNR: "Instructions conforming with our agreements in Alaska are being issued."

Conference Committee Report HR 5279:

"The conferees are agreed that the directive included in the report of the Senate committee with regard to surveys of Alaska land selections made under the terms of the Alaska Statehood Act...will be satisfied by surveys of the exterior boundaries of full townships (even if composed of as many as four land selections) with monumentation at an average of 2 miles around the perimeter."

Senate Report: The committee is concerned about complaints relative to surveys of Alaskan land selections. Reports of Senate and House Committees...on the statehood bills... (do not) indicate that each legal land selection would not or could not be subject to an exterior boundary survey". The State of Alaska has advised that in at least one patent there are included seven separate land selections ... lumped into one tract for one exterior boundary survey. The State asks whether there is any limit on the number of selections and the total area which could be included in one exterior boundary survey... the committee believes that there is." A reading of the statute and the committee reports on the legislation which was enacted into law leads to the clear and definite conclusion that Congress intended that so long as the State selections meet the specifically stated requirements of the act there should be an exterior boundary survey of each land selection made by the State of Alaska.

"Therefore, the committee directs that the Secretary of the Interior cause surveys of Alaskan land selections ... be executed in compliance with this report."

Aug 8, 1963 Summary from State Director BLM Alaska to Director BLM: "Carver is assuming jurisdiction over Alaska...survey practices..." as follows:

- Follow intent of Conference Report on HR 5279 (released in summer of 1963)
 - Surveys will be made for exterior boundaries of full townships (even if composed of as many as four land selections) with monumentation at an average of two miles around the perimeter.
 - Future selections by state will be full townships.

Sept 4, 1963, Secretary Udall to Governor Egan: "BLM will proceed with the survey of State selections in a manner which follows the intent of the Congress as expressed in the Conference Report on HR 5279." BLM will monument the two patented selection areas which were protested by the State. The protest has been withdrawn in view of this agreement.

Additional monuments were authorized (post patent) under special instructions dated May 15 and Aug 15, 1963.

The Aug 8, 1963 summary also noted that it was also agreed that BLM on future surveys will show monumentation plans to the State for concurrence.

50 Years Later

On February 14, 2013, DNR approved a BLM Plan of Survey for Group 948, Alatna Area. This plan specified two mile monumentation for a total of 146 new monuments.

In July 18, 2013, BLM presented a new concept which eventually was called Direct Point Positioning Survey (DPPS). Under the new plan, they would set 31 new monuments. In attendance were executives from DNR Commissioner Office, Division of Mining, Land and Water (DMLW), and BLM Alaska State Office. Under the new plan, only the exterior boundary of the group would be monumented and except where preexisting, monuments would be placed every six miles. This was not presented as a proposal, or a negotiation, but "This is going to happen". We were shocked.

As was the case 50 years ago, BLM thought that they could legally do this under the Statehood Act, and DNR does not think that it is legal, unless we agree. When asked for legal backing, BLM presented a two-page document from the Office of Solicitor, Alaska Region.

DPPS from Alaska's Perspective

From day one, we have been concerned about two aspects, first, achieving equity for the State, and second, whether DPPS is viable both economically and technically. We believe that multiple selections cannot legally be aggregated into one exterior boundary survey.

Equity

The reduction in set monuments is a major loss of value. While the State is amenable to considering any proposal, we are looking for a win-win. The State cannot accept a loss of value of this magnitude without balancing the ledger in some way. We are willing to deal with problems associated with less monuments, if the State has benefitted. We firmly believe that the federal government is obligated to set monuments every two miles along the exterior boundary of each township. The proposal of DPPS is simply a cost transfer to the State. (Refer to map of Grp 948 over DC)

Another equity issue is the fact that DPPS is only authorized for use on State of Alaska entitlements.

We believe the goal of DPPS is to save money for the federal government. We question whether DPPS would make the short list of good proposals for cost reduction. Would it create more problems and costs than it would save? We question the necessity of "paper platting" every section and township. DPPS scraps legal precedent where coordinates are among the lowest of priority of calls in legal descriptions. They become the primary evidence of a corner's location. We are concerned that the density of control is inadequate to identify unique parcels of land and protect the bona fide rights of each adjacent land owner.

BLM presents that DPPS coordinates provide more certainty of location than a monument. Ultimately, a DPPS corner will need to be surveyed and a monument set. We are concerned that the cost to survey individual DPPS parcels in many cases may be greater than the value of the land. We are concerned about the repeatability of establishing the on the ground location of DPPS corners. Cost savings realized by the federal government will be passed down the chain of title and costs will increase, due to no

economy of scale to survey parcels randomly and individually and costs dealing with legal conflicts where land owners occupy their lands without a proper survey.

For the State to convey DPPS parcels, a major project to analyze and change existing statutes and regulations will be required. This will be costly in terms of time and expenses.

There are costs to the general public and the profession. Many surveyors will need to learn a new level of geodetic surveying, and all surveyors will need to learn the new regulations and procedures which will necessarily follow implementation of DPPS. Platting authorities and approving agencies will have additional administrative costs sorting out the anticipated and unanticipated issues that come out of DPPS.

DNR's initial reaction to DPPS was primarily negative, but due to the fact that DPPS has serious support from the federal side, DNR agreed to consider it. BLM has engaged the State at multiple levels. There have been multiple meetings with DNR Commissioners (Sullivan, Balash, Myers, Rutherford and Mack). National BLM Director Neil Kornze personally met with Governor Walker seeking support for DPPS. DNR's Director of Mining, Land and Water, Brent Goodrum became intimately aware of the details of the issues and carried our concerns to the DNR commissioners, and Governor's Office staff, as well as on multiple occasions traveling to Washington DC to meet with all three of Alaska's Congressional delegation to insure that they understood the State's perspective. Don Buhler, BLM Chief Cadastral Surveyor and Bob Dahl came to Alaska and participated in a meeting with senior officials from both DNR and BLM on the issue.

Very little occurred during the first year, but interaction started to pick up mid-2014. In order for DNR to effectively consider DPPS, DNR requested formal documentation, an Instruction Memorandum (IM). In addition to the IM establishing DPPS, we also requested an IM establishing procedures which BLM would find acceptable for a surveyor to monument an unmarked DPPS corner. A draft IM was received in Sept 2015. An approved IM for DPPS was signed September 13, 2016.

Commissioner Myers, past Director of USGS, bringing a scientific approach to the issue, wanted to see an independent third party review as well as actual field testing of DPPS. On October 6, 2015, Gerald Jennings, DNR Survey Section Chief, sent a letter to the National Society of Professional Land Surveyors (NSPS) requesting analysis and comments and provided the state's concerns. This was followed by a Jan 13, 2016 response letter from Don Buhler, Chief Cadastral Surveyor, BLM national office; to which DNR Surveys responded on Feb 29, 2016.

The NSPS report was released on November 14, 2016 and addressed issues in detail. The Committee identified many of the same concerns that the State has and the Committee recommendation is: "The committee has reviewed multiple documents, both very technical and legal in nature, and concludes that the proposed DPPS method fails to protect the rights of the citizens of the state of Alaska through the lands managed by the Department of Natural Resources. It also fails in the fundamental surveying principle across America in which monuments, once established on the ground, control the location of the parcel of land. The in-depth review of the technical aspects of the DPPS process cannot be replicated with the data supplied with the survey."

Agreement on Process

In July 2016, in an attempt to move DPPS forward, the BLM sought an agreement with the State on a path to implementation. An agreement was reached "Agreement on Process to Adopt Direct Point Positioning Survey" signed on July 25, 2016, by DNR Commissioner Mack and BLM Alaska State Director Bud Cribley.

The four-page agreement includes detailed steps for review of DPPS which after completion would lead to a new memorandum of understanding (MOU) to govern the use of DPPS in Alaska to complete the remaining surveys of state entitlement land as well as use in other federal land transfer throughout the state where appropriate.

The first of the steps required before entering into an MOU is to ensure that both BLM and SOA mutually benefit from the adoption of the DPPS and options to ensure equity are explored. This very important step has yet to be accomplished.

The second step is the legal, technical and practical analysis of the proposed DPPS methodology. This includes addressing issues raised by the NSPS review (not completed at the time of agreement); engaging the National Geodetic Survey (NGS) and addressing technical concerns; and BLM and the SOA review of laws and statutes and regulations to determine whether changes are required to minimize impediments to adoption of DPPS. The last item of the required steps is related to completion of the Alatna DPPS Pilot Project (Group 948). The State will complete field testing no later than July 30, 2017.

The Field Test

From the first presentation of DPPS, DNR wanted to see how practical it would be to actually monument a DPPS parcel when constrained by the necessity to protect the rights of a patentee (protect the plat). We wanted to know what the minimum requirements would be procedurally and how costly it would be to execute that survey.

Recognizing the geodetic survey component, we engaged David Doyle, NGS Chief Geodetic Surveyor (retired), to prepare a plan for the field test and assist in our analysis.

The field test was commenced by Gwen Gervelis, DNR Dep. Chief Surveyor, and Nate Toothaker, Land Survey Specialist, on Sept 19 – 22, 2016. BLM provided a helicopter and Sean Porter, Cadastral Surveyor. Some initial data was obtained, but due to weather, completion is postponed until this upcoming season. The initial test included occupying 11 randomly selected points for up to 24 hours, to obtain "true" coordinate values, to compare with the platted values. A copy of DNR's report is attached.

Lessons Learned

Many of BLM's geodetic control stations within Group No. 948 were located on top of mountains and therefore making access by helicopter indispensable, but limiting usability in marginal weather conditions. In large areas of Group No. 948, where there are no mountains, geodetic control is absent. This makes obtaining project datum in those areas difficult.

We question whether Real-Time Kinematic (RTK) setting of DPPS Section corners will succeed in meeting BLM's GPS Standards over much of the Alatna Group 948 area, due to the lack of control monumentation.

Economic Feasibility Questions. It is critical that field testing of the procedure to set monuments at unmarked DPPS points be performed. In the event that RTK cannot be used to meet the February 2009 Standard, in lieu of RTK, it is also necessary to field test the setting of unmarked DPPS corners using static GPS procedures to determine if monumentation of individual parcels will be economically feasible.

Testing will also need to determine technical procedures to access the internet and process data without returning to Fairbanks. During this trip, the lack of cellular service and internet in Bettles precluded any processing of GPS data until returning to the office. Future surveyors will need to be prepared to fly to Fairbanks to process data, then return to Bettles and the field or explore alternative methods such as satellite data links.



Helicopter landing zones in forested areas are difficult to find. Several proposed monuments were not visited due to the lack of a landing zone nearby for the helicopter. With additional time these sites could be accessed by hiking in.

Push for MOU

With the approach of the national elections, there was a push for an MOU from the federal side and several drafts were passed back and forth. Ultimately, no agreement on a new MOU was made and on December 19, 2016, the BLM issued a press release announcing implementation of DPPS and its benefits. The DNR immediately issued a press release stating our opposition.

The BLM press release was accompanied by a letter to Governor Walker from BLM Director Kornze announcing BLM's withdrawal from the 1973 MOU, described below and intent to move forward with implementing DPPS both in Alaska and nationwide.

The 1973 MOU

A Memorandum of Understanding between the State of Alaska and The United States on The Survey of Alaska State Selections was approved effective 9/21/73 (1973 MOU). The purpose of the 1973 MOU has been misunderstood during the DPPS discussion. It has been perceived as implementing the two mile monumentation of each township; however, it actually recognized the continued practice and authorized conveyance of lands to the state based on protraction surveys (example Attachment C). These are only allowed when the State elects to accept them.

In Feb 10, 1981, the DNR notified the BLM that it would no longer accept conveyances based on these protraction surveys. Paraphrasing, "It was anticipated under the 1973 agreement the State would quickly gain title and was willing to accept title based upon a protraction diagram...seven and a half years later, there still remains 19 million acres not patented. The state will no longer accept patent based upon protraction plats."

Statistics from the 1981 letter: "Under the 1973 MOU, 19 separate plats were constructed, covering 1424 townships containing approximately 32,055,129 acres. 13 million acres having been patented, 10.5 million tentatively approved and 8.5 million remaining in selection status."

The authority to convey by protraction <u>only with State concurrence</u> was included in the Alaska National Interest Lands Conservation Act (ANILCA) of Dec. 2, 1980. With the ANILCA provision, the 1973 MOU is essentially moot.

National Geodetic Survey

Recognizing that DPPS makes the National Spatial Reference System (NSRS) a significant factor in the land tenure system, DNR on numerous occasions recommended that NGS be engaged. On Nov 17, 2016 Director Juliana Blackwell sent a letter discussing NGS's role and brief assessment of the NSRS capabilities and limitations with respect to DPPS. The letter points out that coordinates may change over time for a variety of reasons: a) a mark may physically move; b) software used to compute the coordinate may change; c) a new survey may update the position; d) a computational error may be corrected; e) the reference datum may be updated.

NGS recommended to maintain network accuracy, an adequate network of passive control be reobserved over time. Without this, they predict accuracy limitations at the decimeter to meter level. NGS recommends BLM and DNR negotiate the quantity and spacing of passive control. NGS further recommends that data be submitted to NGS to make available to interested parties.

The following week, DNR and BLM met with Dr. Nicole Kinsman, NGS Alaska Regional Geodetic Advisor. The concept of "shelf life" of coordinates was explored. NGS stated that over time, the coordinate value and the physical point on the earth will drift away from one another. Through ties to passive control, the drift can be estimated. BLM clearly stated that the accuracy of the coordinate is only at the time of survey and they do not guarantee the tie to the NSRS. Michael Schoder, Chief Cadastral Surveyor for Alaska indicated that addressing drift of the coordinate through passive control observations, to insure that the location on the earth is repeatable is the State's obligation.

The upshot is that a future patentee will not be able to rely on the coordinates shown on the face of their deed survey because an analysis and adjustment of those coordinates by a professional that is versed in geodesy will be required. BLM presents DPPS as providing greater certainty of location than monuments in the ground, however, DNR believes the contrary.

BLM – DNR Technical Workgroup

In April 2015, BLM surveyors Bob Dahl and Blair Parker met with DNR surveyors Gwen Gervelis, Paul Hickey and Gerald Jennings to discuss DPPS issues. This was among the first of what became weekly meetings of the BLM – DNR Workgroup. Blair came up with the brilliant idea of creating mock scenarios in which the state would oversee approval of surveys subdividing DPPS parcels which DNR received patent. These scenarios have helped bring issues to the surface such as the fact that under state law, in the Unorganized Borough, subdivision of a DPPS parcel would require monumentation of the DPPS parcel itself. There are numerous statutes and regulations which make the segregation of parcels from within a DPPS parcel costlier where BLM does not monument the original parcel. These meetings often addressing other DPPS issues have been quite productive in helping both DNR and BLM better understand the issues.

National Society of Professional Surveyors

The NSPS analysis and comment committee included Dave Doyle, Geodesist – Maryland; Timothy Kent, PLS – Washington; John Kerr, PLS, CFedS – Alaska; John Matonich, PLS – Michigan; Glen Thurow, PLS – CFedS – New Mexico and Karen Tilton, PLS, CFedS – Alaska. Also contributing were Curt Sumner, PLS, NSPS Executive Director; and Jon Warren, PLS, NSPS Past President. The report comprehensively discussed the history, Coordinates as monuments, Survey for conveyance of state lands originally platted by DPPS methods, technical capacity to re-establish a point in space and ability to re-establish a point on the ground. The report coined the term "Three Plus Method", a method which provides a check on stability and provides a method to re-establish an original on-the-ground position without transformations, modeling and acquisition of CORS data.

The report also addresses densification of monumented DPPS corners; efficiency in process (lack of economy of scale – e.g. multiple mobilizations and inefficiency resulting in greater costs); surveying for conveyance or lease; equity of only using DPPS in Alaska; and the Committee's recommendation: "DPPS method fails to protect the rights of the citizens of the State of Alaska."

Summary

Having engaged in the DPPS discussion for 3 ½ years, the DNR's concerns have become more focused and clarified. We believe that the method could be implemented, however it would involve a high cost to the State and the citizens of Alaska. Costs include developing and implementing new statutes, regulations and procedures; training for surveyors and other land professionals; higher costs for setting of monuments after bona fide rights have been conveyed; and higher costs to survey parcels which are tens of miles away from controlling points. We are concerned that every DPPS parcel survey will effectively require a helicopter and we are concerned about the Pandora's Box of legal issues that may ensue.

DNR remains unconvinced of the following contentions made in the September 16, 2016 Instruction Memorandum:

- DPPS method generate a greater certainty of corner positions that are correct, consistent and repeatable.
 - DNR comment: Anyone can ascertain a corner location when it is marked with a monument. A land owner will be much more confused about a coordinate value which requires transformations, modeling and acquisition of CORS data.
- DPPS method introduce an economy of resources in the future for leaseholders and landowners when additional parcel boundary demarcation is required. Geographic coordinates referenced to a known national datum are directly reported...and do not need to be calculated...
 - DNR comment: Unmarked coordinate locations will need to be monumented and this
 will require a surveyor versed in geodesy. With the extreme distances to the nearest
 control and costs to bring a helicopter on site, we don't believe the savings have been
 demonstrated.
- Adoption of DPPS method avoids spending substantial funds on unnecessary procedures like recovery, maintenance, rehabilitation, and measurement between controlling adjacent monuments in future survey work.
 - DNR comment: DPPS parcels will eventually need to be monumented for the land owner to fully occupy. Those monuments will require recovery, etc. Ties between adjacent monuments will be fully necessary, particularly when corners have been monumented by different surveys.
- Surveys conducted using DPPS method can be completed much more quickly than surveys completed using historical methods, thereby facilitating quicker patent to the State.
 - O DNR comment: This would be true for the BLM survey wherein 80% of the survey is postponed for the future.
- Resurveying of lands surveyed by DPPS method can be completed much more quickly than
 resurveys of lands surveyed by legacy methods, thereby decreasing the survey time resulting in
 savings to leaseholders and landowners.
 - o DNR comment: As stated above, we believe this has not been demonstrated.

BLM has completed field work and platting of Alatna (Group 948) and is poised to approve and file. If this occurs, DNR will protest the survey. Meanwhile, BLM has conducted initial field recoveries for 8 additional large DPPS project areas. The State will continue to engage in the discussion regarding how to achieve their goals while mutually benefitting both parties.

We are unsure that DPPS is the best vehicle.