# EXHIBIT 2

# PART ONE

**IN THE UNITED STATES DISTRICT COURT**

**FOR THE EASTERN DISTRICT OF CALIFORNIA**

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| COUNTY OF INYO<br><br>Plaintiff,<br><br>v.<br><br>DEPARTMENT OF THE INTERIOR, *et al.*,<br><br>Defendants, and<br><br>SIERRA CLUB, *et al.*,<br><br>Defendant-Intervenors. | No. 1:06-CV-01502-AWI-DLB<br><br>SECOND DECLARATION OF DOUGLAS C. PFLUGH<br><br>Dennis L. Beck<br>U.S. Magistrate Judge<br><br>Anthony W. Ishii<br>U.S. District Court Judge |

I, Douglas C. Pflugh, declare as follows:

1. The facts and opinions set forth in this declaration are based on my personal knowledge and experience. If called as a witness in these proceedings, I could and would testify competently to these facts and opinions.

## Technical Qualifications

2. I have worked as a Research Associate or Research Analyst for Earthjustice since September 2001. My work at Earthjustice includes the use of aerial photography, Geographic Information System (GIS), other database management and query software, and paper and digital maps and records generated by public and private sources. GIS software uses geospatial data to create maps and perform analyses. GIS is recognized as an important tool for communication

and problem solving by government, industry, and conservation organizations throughout the country.

3. I have a Bachelor of Science degree in Natural Resource Management from California Polytechnic State University San Luis Obispo. This degree was awarded Summa Cum Laude. The course work and related projects leading to this degree included federal land management, environmental law, environmental impact analysis, physical and biological sciences, and land surveying. While at the university, I also pursued studies in and served as a teaching assistant for courses in the outdoor recreation curriculum, including map reading and over-land navigation. These courses included material on and practical application of the understanding and interpretation of USGS topographic maps.

4. I have a Master of Urban Planning degree from the University of Washington. The course work and related research activities leading to this degree included training and experience with aerial photography interpretation, GIS and other database management and query software packages. I completed relevant undergraduate and graduate coursework in the Geography, Landscape Architecture, and Urban Design and Planning departments. The professional project that I completed in lieu of a thesis involved the creation of GIS data and interactive and static maps for the government of an Alaskan city.

5. I have worked in various positions involving GIS and databases for state and local government entities and private firms. My work has included field data collection, database design and development, remote sensing analysis, automation of tasks using scripting languages, preparation of customized user interfaces, and production of maps for inclusion in documents and public display. I have provided GIS and database support for research projects funded by

the National Science Foundation and the United States Geological Survey. I also performed extensive aerial photography interpretation for the USGS-funded project. I provided GIS support for a regional planning project conducted for a Washington county government. Maps that I produced for this project were displayed at the ESRI International User Conference and published in the ESRI Map Book, both industry-recognized showcases for excellence in work. As a research staff member at the University of Washington, I managed data, hardware, and software resources of the Remote Sensing Applications Laboratory and the Urban Ecology Research Laboratory.

6. In July 2002, I presented a talk entitled "Supporting Activism and Litigation: Geography and Oil & Gas Development" at the ESRI International User Conference. This conference is the major GIS industry annual conference and had more than 11,000 attendees. I presented the same talk at the Society for Conservation GIS conference that was held immediately prior to the ESRI event. At the August 2008 ESRI International User Conference, I accepted a Special Achievement in GIS award presented to Earthjustice by ESRI's founder Jack Dangermond.

7. In March 2007, I provided expert trial testimony on the use of GIS analysis to evaluate the cumulative effects of water pollution permits on several watersheds in southern West Virginia in *Ohio Valley Environmental Coalition v. U.S. Army Corps of Eng'rs*, 479 F.Supp.2d 607 (U.S. District Court for the Southern District of W. Va., March 23, 2007).

8. Prior to graduate school, I worked for the National Outdoor Leadership School as a field instructor and program coordinator. This work included supervising up to seventeen students and two fellow staff on wilderness expeditions up to a month in length in various

locations in the western United States. Map interpretation was both taught and practiced throughout the duration of these courses. I accumulated just under 100 weeks of field time during my tenure. My work also included natural sciences education and cave survey and mapping. In addition to my time at the school, I have further extensive expeditionary experience on personal outings and as a field researcher for the National Audubon Society.

**Published Maps of the Vicinity of the Head of Last Chance Canyon**

9. I reviewed digital images of the two USGS maps referred to in paragraphs 5 and 6 of the Declaration of Ralph H. Keller in this case (dated October 30, 2009 and hereinafter referred to as the "Keller Declaration"), captioned "Lida" and "Magruder Mountain, Nevada-California." [1] The first map, "Lida," hereinafter referred to as "Lida 1913" and attached as Exhibit A, was published in 1913, at a scale of 1:250,000.[2] This map was developed from surveying conducted in 1897-1898, 1905, and 1911. My review of the map indicates that it has common characteristics of USGS topographic maps and includes depictions of both natural and manmade features. I also noted that this map depicts a dashed line, indicating a feature classified as a "trail or path," heading southeast from the Willow Creek Road[3] to the head, or northern terminus, of Last Chance Canyon. This trail feature continues south into Last Chance Canyon where it follows the canyon floor for a short distance before climbing up the western wall and then traversing to Last Chance Spring.

[1] Although I here reference the digital versions of these maps that were included with the Keller Declaration, Earthjustice has also subsequently obtained digital versions (scanned versions of USGS library copies of these maps) and paper copies of both the Lida 1913 map and the Magruder Mountain 1957 map from USGS personnel.
[2] This and subsequent statements about the source material and publication of the USGS maps are based on my reading of the information contained on the map collars.
[3] My reference here, and subsequently, to "Willow Creek Road" is to the feature so identified on the State-wide Highway Planning Survey map, 1954, attached as Exhibit C to the Declaration of Bernard T. Pedersen in this case (dated October 28, 2009), and attached here as Exhibit F.

10. The second map from Mr. Keller's declaration, "Magruder Mountain, Nevada-California," hereinafter referred to as "Magruder Mountain 1957" and attached as Exhibit B, was published in 1957, at a scale of 1:62,500, and is identified on the sheet as "N3715-W11730/15." The map was developed from aerial photography taken in 1952, and field work conducted in 1957. My review of the map indicates that it has common characteristics of USGS topographic maps and includes depictions of both natural and manmade features. I also noted that this map depicts a double dashed line, indicating a feature classified as a "unimproved dirt" road, heading southeast from the Willow Creek Road from roughly the same location as the "trail or path" feature on the Lida 1913 map described above. This feature transitions to a single dashed line, a "trail," just north of the head of the canyon. The trail feature then continues roughly south, following the floor of Last Chance Canyon, into Death Valley.

11. I also downloaded and reviewed a digital image of the map "Last Chance Range, California-Nevada" from the USGS Store website (http://store.usgs.gov). This map, hereinafter referred to as "Last Chance Range 1985" and attached as Exhibit C, was published in 1985, at a scale of 1:100,000, and is identified on the sheet as "37117-A1-TM-100." The map was developed from USGS 1:24,000 and 1:62,500-scale topographic maps dated 1957-1982; the planimetry was revised based on aerial photography taken in 1980, as well as other source data. Based on the overlap of coverage, I believe that the Magruder Mountain 1957 map provided the base information for this later map in the area of the claim and the cultural features depicted should be derived from the Magruder Mountain 1957 map. My review of the map indicates that it has common characteristics of USGS topographic maps and includes depictions of both natural and manmade features. I also noted that this map depicts a thin solid line, indicating a feature classified as a "other road or street," heading southeast from the Willow Creek Road from

roughly the same location as the "trail or path" feature on the Lida 1913 map described above. This feature transitions to a single dashed line, a "trail" labeled "4WD," just north of the head of the Last Chance Canyon and follows the floor of the canyon into Death Valley.

12. I also downloaded and reviewed a digital image of the map "Last Chance Mountain, California-Nevada" from the USGS Store website.[4] This map, hereinafter referred to as "Last Chance Mountain 1987" and attached as Exhibit D, was published as a Provisional Edition in 1987, at a scale of 1:24,000, and is identified on the sheet as "37117-C6-TF-024." The map was developed from aerial photography taken in 1980 and 1982, and field work conducted in 1984. My review of the map indicates that it has common characteristics of USGS topographic maps and includes depictions of both natural and manmade features. This map depicts a single dashed line labeled "4WD," indicating a four-wheel drive "trail," heading southeast from the Willow Creek Road from roughly the same location as the "trail or path" feature on the Lida 1913 map described above. This trail feature comes to an end at the rim of Last Chance Canyon.

13. After obtaining all of the above referenced maps, I compared the manmade features in the vicinity of the head of Last Chance Canyon as depicted on each. Significantly, during this review I noted that the southern end of the feature described in Paragraph 12 above (the feature depicted on the Last Chance Mountain 1987 map) differs significantly from the same portion of the similar features on the Magruder Mountain 1957 and Last Chance Range 1985 maps. (The scale of the Lida 1913 map is such that I could not make a meaningful comparison.) I observed that this difference is most apparent when the Last Chance Mountain 1987 map is

compared with the Magruder Mountain 1957 map, as the Magruder Mountain 1957 map is most similar in scale to the Last Chance Mountain 1987 map (1:62,500 compared with 1:24,000). On both of these maps, I noted that the head, or northern end, of Last Chance Canyon is divided into two tributary canyons by a prominent ridge bisecting the canyon in a northwest/southeast direction. On the Last Chance Mountain 1987 map, I noted that the four-wheel drive trail feature (described in Paragraph 12 above) heading south from Willow Creek Road terminates overlooking the western tributary canyon of Last Chance Canyon. On the Magruder Mountain 1957 map, I noted that the unimproved dirt road feature (described in Paragraph 10 above) enters the eastern tributary canyon of Last Chance Canyon.

14. I measured the difference between the terminus of the Last Chance Mountain 1987 trail and the point that the Magruder Mountain 1957 road crosses the ridgeline. Initially, I did this by "eyeballing" (i.e., visually transposing based on the topography) the approximate location of the Magruder Mountain 1957 road on the Last Chance Mountain 1987 map and measuring the difference using a wooden 1:24,000 scale. As the scales of the two maps differed, the topographic contour lines did not match exactly and I estimated the likely location of the Magruder Mountain 1957 road based on the topography and what appeared to be the most likely route into the canyon in the approximate area. With this method I calculated a rough difference of approximately 1500 feet apart. Subsequent to the June 10, 2010, field visit conducted as part of the depositions for this case, I re-assessed the measurement using digital data and GIS. The digital data were the ESRI ArcGIS Online USA Topographic Maps service, which for this location at this scale is the scanned version of the Last Chance Mountain 1987 map, and the Inyo County digital data layer inyo_county_claims (provided to me in January 2008 by Inyo County

[4] Although I here reference the digital version of the maps, Earthjustice has also subsequently obtained paper copies

Public Works staff). I did not have access to a geo-referenced digital version of the Magruder Mountain 1957 map and, as the Inyo County data appeared from my visual inspection to match the Magruder Mountain 1957 road, I consequently used the Inyo County data as a reference. With this method, using the GIS measuring tool with the digital data displayed at a scale of 1:24,000, I calculated a difference of approximately 900 feet. I feel that this second measurement is more accurate but due to the scale, and scale difference, of the two original maps, I do not believe that a more precise location difference can be determined from maps or the GIS.

15. Significantly, I also noted that the two tributary canyons of Last Chance Canyon do not meet downstream for nearly one mile. That is, if the marked routes were used to access Last Chance Canyon, very different portions of the canyon would be traversed. I have prepared Exhibit E, comprised of enlarged portions of the Magruder Mountain 1957 and Last Chance Mountain 1987 maps, to illustrate this difference between the maps. The displayed portion of both maps in the exhibit is roughly the same location and the dark lined circles enclose the area of interest.

16. I further noted that the County's claimed route, as identified by the Declaration of Bernard T. Pedersen in this case (dated October 28, 2009 and hereinafter referred to as "Pedersen Declaration"), follows the alignment of the feature on the Last Chance Mountain 1987 map. Mr. Pedersen stated that he walked the claimed route and, as he was equipped with a GPS device with a graphic display of the Last Chance Mountain 1987 map, he was able to determine that the claimed route "followed the map quite closely." Pedersen Declaration at ¶ 7. Mr. Pedersen's

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of the Last Chance Mountain 1987 map from USGS personnel.

statement concerning the alignment of the claimed route indicates that the claimed route significantly deviates from the alignment of the unimproved dirt road feature indicated on the Magruder Mountain 1957 map.

17. I have also reviewed the State-wide Highway Planning Survey map, 1954, attached as Exhibit C to the Pedersen Declaration (hereinafter referred to as "County Road System map" and attached as Exhibit F). Due to the scale and general imprecision of the County Road System map, I found it difficult to compare the feature depicted as "Last Chance Road" with the similarly located features found on the USGS maps. In general, the feature labeled "Last Chance Road" on the County Road System map appears to more closely follow the alignment of the unimproved dirt road features on the Magruder Mountain 1957 and Last Chance Range 1985 maps than the trail depicted on the Last Chance Mountain 1987 map. This indicates to me that the County's claimed route as identified by Mr. Pedersen (see Paragraph 16 above) may significantly deviate from the alignment of the route as indicated on the County Road System map.

**Aerial Photography of the Vicinity of the Head of Last Chance Canyon**

18. On November 20, 2009, I visited the USGS National Geospatial Technical Operations Center (NGTOC) which is located in the Federal Center in Lakewood, Colorado. At the NGTOC, I reviewed aerial photographs that I believe were used to develop the Magruder Mountain 1957 and Last Chance Mountain 1987 maps described above. These photographs were retrieved from the USGS warehouse by a NGTOC employee in response to my request. I compared these photographs with the reference maps that I had created.

19. I identified the photography of interest to me using the USGS Earth Explorer online reference tool. I used a geographic box sufficient to enclose the approximate area from the Willow Creek Road to the head of the Last Chance Canyon and searched for aerial photo mosaic and aerial photo single frame resources in the Earth Explorer database. The flights which I identified as relevant were:

| Project Name | Acquisition Date | Scale | Image Type |
|---|---|---|---|
| Western Army Map Service Project No. 109, Area G | 1952 | 1:60,000 | BW |
| GS-VFDT | 1982 | 1:24,000 | BW |

20. I identified the frames (the actual photographs) that provided the best coverage by: 1) reviewing the aerial photo mosaic of the Army Map Service photography (acquired from Earth Explorer), and 2) previewing the individual frames of the GS-VFDT project.

21. My review of the photographs showed that the landscape features on the photography substantially agree with those on the topographic maps and that the dates of the photography are consistent with those listed on the USGS topographic maps.

22. The procedures used by USGS for map compilation and field verification were explained to me by USGS employees on April 18 and April 25, 2005, and November 3 and November 20, 2009, during visits to the NGTOC and the USGS Map Store (also located in the Federal Center). I was also given (in 2005 and 2009) copies of six different successive USGS

topographic map standards for road classification and map symbol descriptions that were in use as of 1913, 1928, 1958, 1967, 1974, and 1988, respectively. Based on my experience and training, discussions with USGS employees who assisted me, and my review of the standards documents, I believe that markings on the aerial photographs described above are notes from field work conducted by USGS personnel to verify content before the topographic maps were published as was customary during the period that these maps were produced.

23. I reviewed Western Army Map Service Project No. 109 photography (hereinafter "Army Map Service 1952 photography"), frames 793 and 794, acquired on October 13, 1952, using a pocket stereoscope. I found that a feature roughly corresponding to the unimproved dirt road feature that I identified on the Magruder Mountain 1957 map (as described above) was marked with a dashed red line on frame 794. A reproduction of this photograph is attached as Exhibit G. I also noted that it was marked with a "6," indicating classification as a unimproved dirt road; the continuation of this feature to the southeast (from approximately the canyon south) is classified as "7 foot," a foot trail. It appears that the initial marking of the feature north of Last Chance Canyon (i.e, between the canyon and Willow Creek Road) was also as "7 foot," but that this was partial erased and the "6" added over the original marking. On the other frame of the stereoscopic pair, 793, on which the feature was not marked, I noted that a minor feature was visible (i.e., I could see something on the ground) on the photography for a short distance—approximately 100 yards—heading south from the Willow Creek Road. I could not, at this scale, positively identify it as a road or other feature, such as a wash. I also noted that after the first short section no feature was visible on frame 793 where the markings were indicated on frame 794. That is, I did not identify any feature (other than the interpreter's markings) comparable to the unimproved dirt road indicated on the Magruder Mountain 1957 map after approximately

100 yards south of the Willow Creek Road. A reproduction of this photograph, frame 793, is attached here as Exhibit H.

24. I also reviewed USGS GS-VFDT project photography (hereinafter "GS-VFDT 1982 photography"), frames 9-248 and 9-249, acquired on April 18, 1982, using a pocket stereoscope. A reproduction of frame 9-248 is attached here as Exhibit I. I found that a minor feature was visible (i.e., I could see something on the ground) that roughly corresponded with the four-wheel drive trail feature on the Last Chance Mountain 1987 map. The ends of this feature were marked on the photography and labeled "4WD." As with the Army Map Service 1952 photography, I was not able to definitively determine what the feature represented on the ground.

25. After reviewing the photography sets individually, I compared them. As with the features on the USGS topographic maps, I noted that the southern portion of the features (noted as "6" on the Army Map Service 1952 photography and as "4WD" on the GS-VFDT 1982 photography), south of approximately 800 to 1000 feet south of Willow Creek Road, vary between the two photography sets. I did not note any features that corresponded to the feature marked on the other photography and map pairs; that is, I did not note a feature corresponding to the Magruder Mountain 1957 map's road feature on the GS-VFDT 1982 photography, or a feature corresponding to the Last Chance Mountain 1987 maps' trail feature on the Army Map Service 1952 photography.

**Conclusions**

26. I have reviewed maps and photography depicting the area spanning from the Willow Creek Road to the head of Last Chance Canyon. I have found that although a route heading south from Willow Creek Road to the head of Last Chance Canyon is depicted on several maps—Lida 1913, Magruder Mountain 1957, Last Chance Range 1982, Last Chance Mountain 1987, and the County Road System map—the actual alignment, length, and destinations of the depicted routes varies over time and significantly so between the Magruder Mountain 1957 map and the Last Chance Mountain 1987 map. I have also found that although a feature heading south from Willow Creek Road towards the head of Last Chance Canyon is depicted on photography from 1952, the actual alignment and destination of this feature is unclear and possibly inconsistent with the feature depicted on the 1982 photography.

Pursuant to 28 U.S.C. Section 1746, I declare under penalty of perjury under the laws of the United States that the foregoing is true and correct to the best of my knowledge, information, and belief.

Executed at Denver, Colorado on August 20, 2010.

Douglas C. Pflugh