

Harpold & Stukel Mineral Pit Renewal Environmental Assessment

#DOI-BLM-OR-L040-2014-12-EA (amended)

BLM OFFICE: Klamath Falls Resource Area, Lakeview District

LEASE/CASE FILE #: Harpold Quarry OROR 67655; Stukel Quarry OROR 67658

APPLICANT: Klamath County Public Works Department (KCPWD)

INTRODUCTION

The Klamath Falls Resource Area (KFRA), Bureau of Land Management (BLM) has prepared this environmental assessment in response to a request from Klamath County Public Works Department (KCPWD) to renew their free use permits (FUPs) for the Harpold and Stukel Mineral Pits. The permits expired in 2012 and KCPWD submitted an application to renew the FUPs they have held for these sites since the 1980s. The Harpold and Stukel Quarries contain common varieties of gravel and rock which KCPWD uses for construction and maintenance of county roads.

PROJECT LOCATION

The **Harpold Quarry** is located southwest of Bonanza in T. 39 S., R. 11 E. Section 19 (see maps in Appendix A). The FUP area is approximately 160 acres in size, with approximately 42 acres of public land disturbed. The permit includes an additional 40 acre parcel to be used as a stockpile and staging area. The permit area is adjacent to a 65-acre mineral pit to the southwest owned by Klamath County and an adjoining Bureau of Reclamation mineral site to the southeast.

The **Stukel Quarry** is located southeast of Klamath Falls in T. 40 S., R. 10 E. Section 5, S½ NE¼ (see maps in Appendix A). The FUP area is approximately 80 acres in size, with approximately 36 acres of public land disturbed. The permit area borders an Oregon Department of Transportation (ODOT) material site right-of-way to the southeast, and a private land quarry to the southwest.

PURPOSE & NEED FOR ACTION

The purpose of the action is to respond to the application from Klamath County Public Works Department (KCPWD) under 43 CFR 3600 regulations to renew the Free Use Permits for Harpold and Stukel Mineral Material Sites.

The need for action is driven by BLM's policy to manage public lands in a manner that recognizes the Nation's need for domestic sources of minerals (Federal Land Policy and Management Act of 1976, Section 102 (12)), to make mineral materials available (43 CFR 3601.6 (a)), and to permit local government entities free use of these materials for qualified purposes (43 CFR 3601.6 (c)).

CONFORMANCE WITH APPLICABLE LAND USE PLAN

This project has been designed to comply with the land use allocations, management direction, and objectives of the 1995 Klamath Falls Resource Area Resource Management Plan (RMP). This Environmental Assessment is tiered to the Final - Klamath Falls Resource Area Resource Management Plan and Environmental Impact Statement, September 1994 (KFRA RMP/EIS). The project design and recommendations for implementation are contained in the RMP and a number of other supporting documents including:

- Federal Land Policy and Management Act of 1976 (FLPMA)
- Mining and Minerals Policy Act of 1970
- 43 Code of Federal Regulations (C.F.R.) 3809, Surface Management Regulations
- Mining Law of 1872 (30 United States Code (U.S.C.) § 22-24, 26-28, 29-30, 33-35, 37, 39-42 and 47, May 10, 1872, as amended 1875, 1880, 1921, 1925, 1958, 1960, & 1993

PUBLIC INVOLVEMENT

A scoping letter requesting comments on the Harpold and Stukel Mineral Pit Free Use Permit Renewal was mailed to 70 adjacent landowners, agencies, groups, individuals, and other interested parties on April 3, 2013. No comments were received.

DESCRIPTION OF PROPOSED ACTION

The proposed action is to provide mineral materials to KCPWD from two (2) mineral material sites within Klamath County, Oregon. The BLM would provide mineral materials to KCPWD through two FUP authorizations. KCPWD has previously held FUP authorizations in these sites, and the terms would not exceed 10 years. There would be no expansion of the proposed areas of mineral disposal from the last permitted FUPs (Harpold 160 acres, Stukel 80 acres).

KCPWD estimates the annual removal quantity to be 50,000 cubic yards for the Harpold site and 30,000 cubic yards annually for the Stukel Mountain site. As the mineral material resource is exhausted or need for the material is diminished, the mineral material sites would be reclaimed and closed as specified in the stipulations that accompany the FUPs.

Note: After the EA went out for review, a concern was raised by a KFRA wildlife biologist regarding the need to upgrade/replace the gate on Harpold Road leading into Harpold Quarry. The existing powder river gate is used to control cattle, but the chain and locks are continually cut off, precluding an effective closure. The proposed action now includes the installation of a pipe gate adjacent to (inside) the existing powder river gate. The pipe gate will include a lock box, and will be locked only during the Deer Winter Range Closure from November 1 through April 15. The existing gate, which was previously locked year-round, will remain closed (but not locked) during the cattle grazing season.

Operations

Mining will occur in the SW ¼ NE ¼ and E ½ NW ½ of Section 19 in the Harpold permitted area, and on the easterly slopes of the Stukel Mountain permitted area. Vegetation cover (brush and trees) will be mechanically chipped, piled, and re-used for reclamation if the pit is vacated by KCPWD and closed during the permitted period.

Klamath County would strip and stockpile any overburden consisting of topsoil and fines from areas that they intend to remove sand and gravel. Though the entire mixture (overburden plus gravel) is preferred by operators because it acts as a binder, the operator would be required to save the overburden as it is a growth medium used for reclamation and revegetation when the permitted mineral material site areas reach exhaustion. Overburden removal would only be completed when expanding into areas that had not already been pre-stripped by prior activities.

The actual mining and removal of the sand and gravel would utilize a variety of heavy equipment including bull-dozers, scrapers, front-end loaders and various sized haul trucks. Bulk fuels and lubricants would be available on site as work is carried out by the county and

various public customers. These materials would not be stored on site. KCPWD may also use a screening and/or a crushing plant at the sites. This type of equipment is mobile and would move from site to site, such as in the case of the county, as the need arose. All equipment would be removed from the material sites when the resource is no longer needed, is exhausted or at the expiration of the FUP as specified in the contracts.

Between operating periods the pit walls would be maintained at a slope ratio not to exceed 2h:1v (horizontal: vertical). Upon final pit exhaustion, the reclamation would consist of burial of all fines and any remaining over-sized material, re-contouring the pit walls to a 3h:1v slope, scarifying the pit floors and access roads, spreading the stockpiled topsoil over the pit area, and seeding the area with an approved Klamath Falls BLM seed mixture.

Occupancy of the FUP mineral material sites is a possibility during actual periods of work activity. The majority of occupancy would only be the presence of a piece of equipment such as a front-end loader or a back-hoe that was left on site during the mining and removal of the material. These activities tend to be of short duration, occurring for a few days or a week in a year, over a contract with perhaps a five year term. Occasionally, a larger piece of equipment such as a screening plant might be left in a mineral material site during a project. These are all portable units and would be removed at the end of a project. Usually a stockpile of processed materials is created which is then drawn from as needed.

All of the proposed mineral material sites would be accessed by existing roads. Klamath County would not be required to obtain an easement or right-of-way either of these mineral material sites being proposed for the FUP renewal.

ANALYSIS OF ENVIRONMENTAL IMPACTS

The affected environment reflects the existing condition that has developed from all past natural events and management actions within the project area (and/or 5th field watershed). It is a combination of natural and human caused fires, fire suppression, road building, timber harvesting, grazing, fuel reduction treatments, and the effects of recreational use. The current condition assessed for each affected resource is a result of all past natural events and management actions. It is therefore unnecessary to individually catalog all past actions in this EA. Such detail would be irrelevant to making a rational decision among alternatives. The important value of this EA is to assess and display for the deciding official the impacts of the alternatives on those resources as they exist today, to allow a determination if the resulting project effects and/or cumulative effects are either significant or are greater than those analyzed in the RMP EIS.

EFFECTS COMMON TO ALL RESOURCES

The EA was amended to include a gate upgrade/replacement for the Harpold Quarry. The proposed action includes installation of a pipe gate adjacent to (and inside) the existing powder river gate. It will be locked only during the Deer Winter Range Closure from November 1 through April 15. This upgraded pipe gate will provide a more effective seasonal closure than the current gate. The existing gate, which was previously locked year-round, will remain closed, but not locked, during the cattle grazing season. The KFRA interdisciplinary team of resource specialists determined that there would be no additional effects due to the pipe gate installation.

Affected Environment for Minerals

The mineral materials analyzed in this EA are derived from volcanic flow material or more recent fluvial processes.

Harpold Quarry

This is a very popular material site used by KCPWD. The gravel quarry cuts down the middle of two distinct geologic materials. The northwestern half is a Miocene to Pliocene age volcanic rock (35 to 2.6 million years before present {mybp}) composed of partially weathered olivine basalt. The southeastern half is a Miocene to Pliocene age tuffaceous sedimentary rock and volcanic tuff (35 to 2.6 mybp). There is also a minor component of Miocene Basalt (35 to 24 mybp) located in the southeast. The site is located on the southeast extent of Horton Rim, to the northeast of Poe Valley, and just west of the town of Bonanza at an elevation of approximately 4580 feet with a mix of sagebrush, rabbit brush, juniper and pine. Approximately 40% of the current project area has surface disturbance related to past mining activities.

Stukel Mountain Quarry

This is a very popular material site used by KCPWD. The gravel material is a Miocene to Pliocene age (35 to 2.6 mybp) volcanic rock composed of partially weathered olivine basalt. The site is bounded on three sides by Pleistocene to Holocene age (2.6 mybp to present day) sedimentary rock made up of landslide and debris flow deposits. It is also bordered on the West by Pleistocene age (2.5 mybp to 10,000 ybp) lacustrine and fluvial sedimentary deposits. The site is located on the northwest extent of Stukel Mountain, to the east of Spring Lake Valley, and to the south of Wilson Reservoir at an elevation of approximately 4600 feet with a mix of sagebrush, rabbit brush, juniper and pine. Approximately 50% of the current project area has surface disturbance related to past mining activities.

Environmental Impacts for Minerals

No Action

Under the No Action Alternative, the permits would not be renewed, nor would there be any additional acreage added. The remainder of the mineral material sites would be reclaimed and closed as specified in the stipulations that accompany the FUPs. The existing areas would be re-contoured and seeded, resulting in a gentle 3:1 sloped topography over the old mined pit surface. There would be no further removal of the existing land forms that may be associated with each material site.

Proposed Action

Implementation of the proposed action would permit continuation of aggregate removal and associated mining activities throughout the permitted areas. The amount of surface area disturbed would increase from present levels, but would not extend beyond the boundaries of the permitted quarries.

Mining of the various geomorphological features would eventually remove them from the landscape, usually lowering the ground profile. The resulting topography after final mineral material site reclamation would have shallow, 3:1 slopes on former open pit features. All stockpiles would be removed or be reshaped to blend in with the surrounding area. The areas would then be re-vegetated with BLM approved seed mixtures.

Affected Environment for Soils

Harpold Quarry

The Natural Resources Conservation Service soil survey identified two soil map units (or types) within the 160-acre permitted area. The dominant soil is 50E, Lorella very stony loam, on 2 to 35 percent south slopes. These shallow rocky soils formed in material weathered from volcanic tuff and basalt flows. They are characterized by a very cobbly loam surface over very cobbly clay loam and clay subsoils. Lorella soils typically support plant communities of western juniper, grasses, bitterbrush, and sagebrush.

Due to their high clay content and shallow depths, Lorella soils exhibit very slow infiltration rates and a severe hazard of erosion from unsurfaced roads. Lorella soils rate “poor” as a potential source of topsoil or reclamation material. Accordingly, revegetation and stabilization are likely to be very difficult and costly on sites dominated by Lorella soils (NRCS, 2012).

Soil map unit 51E represents a minor component of the project area. 51E is a steep north-facing unit composed primarily of Lorella soils, but also includes deep loamy Calimus soils. The erosion hazard rating for unit 51E is “moderate”; otherwise, soil suitabilities and limitations are similar to those described for 50E.

The Harpold mineral site has been mined for many years in the past. Consequently, most of the permitted area shows evidence of surface disturbance from mining, roads, and other aggregate removal activities. Although the soils present at the quarry site present a high potential for runoff and a severe erosion hazard, substantial soil loss has not occurred. Presently there are no topsoil stockpiles within the Harpold quarry site.

Stukel Mountain Quarry

The Stukel Mountain permitted area consists of nearly equal acreages of soil map units 16E and 51E. Approximately 40 acres on the west end of the quarry are designated as 16E, Dehlinger very stony loam, 15 to 65 percent south slopes. Dehlinger soils formed in material weathered from volcanic tuff and basalt flows. They are characterized by very stony loam surfaces over extremely gravelly clay loam subsoils. The 40 acres on the east side of the permitted area are composed of unit 51E. This steep north-facing unit is composed primarily of Lorella soils, but also includes deep loamy Calimus soils. Soil units 16E and 51E typically support sparse plant communities of western juniper, grasses, bitterbrush, and sagebrush.

Dehlinger soils exhibit moderate infiltration rates and severe erosion hazard from unsurfaced roads. NRCS rates Dehlinger soils “good” as a potential source of reclamation material, but as a source of topsoil they rate “poor”.

The east half of the Stukel Quarry comprises soil type 51E, the Lorella-Calimus soils. The suitability and limitations of unit 51E are similar to those previously described for 50E in all respects, with the exception of moderate erosion hazards.

The Stukel mineral site has been mined for many years in the past. Accordingly, most of the permitted area shows evidence of surface disturbance from mining, roads, and other aggregate removal activities. Although the soils present at the quarry site present a high potential for runoff and a severe erosion hazard, substantial soil loss has not occurred. Presently there are no topsoil stockpiles within the permitted area of the quarry site.

Environmental Impacts for Soils

No Action

If the proposed action is not implemented, aggregate removal and associated mining activities would cease in both permitted areas. The amount of surface area disturbed would not increase from present levels. Impacts to soil resources caused by surface disturbance would be limited to those acres within the existing permitted areas that have been previously disturbed.

Direct effects on soil resources would include permanent removal of soil resulting from past grading and excavation activities. As such, soil resources would remain in the current condition. Indirect effects such as degradation of soil resources from loss of productivity, OHV activities, and introduction of weeds would persist.

Proposed Action

Implementation of the proposed action would permit continuation of aggregate removal and associated mining activities throughout the permitted areas. The amount of surface area disturbed would increase from present levels, but would not extend beyond the boundaries of the permitted quarries. Conceivably, all soil resources within the permitted area would be disturbed or subject to disturbance.

Soil resource impacts such as complete topsoil removal and mixing of layers would continue within the quarry boundaries. Direct effects on soil resources would include temporary or permanent removal of soil through grading or excavation. Indirect effects could include continued degradation of soil resources from loss of productivity, OHV activities, and introduction of weeds.

A stipulation of a previous environmental assessment (EA-OR-10-05) required topsoil be salvaged, stockpiled, and reserved for final mineral site reclamation. These activities have not occurred at either quarry site. The absence of suitable growth media will likely influence the success of reclamation efforts.

To prevent long-term site productivity losses and promote successful future reclamation activities, soil resource project design features (PDFs) are referenced below. These listed best management practices are recommended for sites of suitable soils and growth media for reclamation. Where topsoil salvage and storage is not feasible, off-site import of growth media will be required for successful reclamation of mine-related disturbance.

Soil Resource Project Design Features (PDFs)

1. Designate area for topsoil storage/salvage that is apart from haul routes or heavy equipment operations.
2. Remove topsoil and subsoil separately before mining and retain for reclamation in designated areas.

3. Keep storage piles to a maximum of 25 feet in height.
4. To minimize erosion and retain soil productivity, seeding storage piles is suggested.
5. Upon completion of operations reapply topsoil from all excavations and construction activities during reclamation. A minimum of 10 inches of topsoil is recommended.
6. Sites may also require re-shaping or re-contouring to minimize erosion and/or increase revegetation success.

Affected Environment for Botany and Weeds

Harpold Quarry

The Harpold Quarry area was surveyed for noxious weeds and special status species in 2013. There were no special status species discovered. Bull thistle was the only noxious weed species found in the project area. The Oregon Department of Agriculture Noxious Weed Control Policy and Classification System for 2013 classify this species as a “B” designated weed (a weed of economic importance that is regionally abundant, but may have limited distribution in some counties). The site was treated with chemical herbicide in 2013 and will continue to be monitored over the next ten years to ensure control. The Klamath Falls Resource Area BLM has an ongoing partnership with the Oregon Department of Agriculture to treat noxious weeds as found on BLM roads and quarries.

Stukel Mountain Quarry

The Stukel Mountain Quarry area was surveyed for noxious weeds and special status species in 2013. There were no special status species discovered. Bull thistle was the only noxious weed species found in the project area. The site was treated with chemical herbicide in 2013 and will continue to be monitored over the next ten years to ensure control.

Environmental Impacts for Botany and Weeds

No Action

Under the No Action Alternative, aggregate removal and associated mining activities would cease in both permitted areas. The amount of surface area disturbed would not increase from present levels, allowing minimal impacts to noxious weeds and allow noxious weeds to continue on their gradual rate of spread. The risk of importing noxious weed plant parts and seed would be ceased.

Proposed Action

Implementation of the proposed action would permit continuation of aggregate removal and associated mining activities throughout the permitted areas. The amount of surface area disturbed would increase from present levels, but would not extend beyond the boundaries of the permitted quarries. All areas within the permitted boundary would be disturbed or subject to disturbance, which would result in an increase of noxious weed infestations. This effect will be mitigated, however, because the Klamath Falls Resource Area has an ongoing noxious weed management program which includes regular chemical herbicide treatment by the Oregon Department of Agriculture on a seasonal basis. Thus, the risk of noxious weed populations expanding would be low.

Affected Environment for Hydrology

Harpold Quarry

Surface Water Resources

The site is in the Yonna Valley-Lost River watershed which is approximately 144,270 acres and includes the Lost River. There are not any streams that occur within the site. The area surrounding the Harpold site drains into the Lost River which is currently listed as a 303(d) stream by the Oregon Department of Environmental Quality.

Groundwater Resources

There is a well located within the Harpold Quarry. This well is currently considered an exempt use well which allows up to 5,000 gallons per day to be used for industrial or commercial uses. This well could be used for activities such as on-site dust abatement. It was drilled to 306 feet and when tested in 1992 had a static water level of 120 feet.

Stukel Mountain Quarry

Surface Water Resources

Stukel Mountain Quarry is located within the Mills Creek-Lost River watershed which is approximately 168,825 acres. There are not any streams that occur within the site. The area surrounding the Stukel Mountain Quarry drains into the Lost River which is currently listed as a 303(d) stream by the Oregon Department of Environmental Quality.

Groundwater Resources

There are not any wells located within the Stukel Mountain Quarry. The water table depth within the project is unknown.

Environmental Impacts for Hydrology

No Action

Under the No Action Alternative, aggregate removal and associated mining activities would not continue in either of the permitted areas. The amount of surface area disturbed would not increase from present levels. The current access roads to pad areas would be ripped and seeded for both sites. The pad areas would also be ripped for sediment and erosion protection at both sites.

Proposed Action

The proposed action would not use or consume surface water so impacts to surface water flows would be negligible. **Project design features (PDFs) listed below would limit indirect impacts to surface water quality from sedimentation.**

1. Consider temporary measures such as silt fences, straw bales, or mulching to trap sediment in sensitive areas until reclaimed areas are stabilized with vegetation.
2. Reshape to approximate original contour all areas to be permanently reclaimed, providing for proper surface drainage.
3. Provide proper drainage on roads to limit sediment routing.

The Harpold well may be used for dust abatement at a maximum extraction of 5,000 gallons per day. No impacts to groundwater are expected to occur at either Harpold Quarry or Stukel Mountain Quarry.

Affected Environment for Wildlife

This section focuses on species considered special status species that may be affected from proposed management activities. These include species listed under the Endangered Species Act (ESA - listed, proposed and candidate species) and species listed under the BLM special status species policy, such as bureau sensitive and land birds classified as Species of Concern (USDI FWS 2008) by the U.S. Fish and Wildlife Service (FWS).

There are no terrestrial threatened or endangered listed, proposed, candidate species or designated critical habitat under the Endangered Species Act (as amended USDI FWS 1973) that occur within or adjacent to the Stukel or Harpold quarries or that would be affected from project activities. Therefore, the BLM made a “No Effect” determination for all terrestrial listed or proposed species and for designated critical habitat. The proposed area is also not essential habitat for Bureau Sensitive species or land birds classified as Species of Concern by the FWS. Therefore, those species will not be addressed further.

The Stukel quarry has a prairie falcon nest within the cliffs on the eastern portion of the current excavated area. The Harpold quarry is within mule deer summer and winter range.

Environmental Impacts for Wildlife

No Action

The no action alternative would continue to provide summer and winter habitat for mule deer at its current level and nesting structure for the prairie falcon.

Proposed Action

Expansion of the current excavated area at the Harpold quarry would result in loss of shrub steppe vegetation within mule deer habitat. The overall reduction of habitat based on the past 10 years would not exceed 15-20 acres. This small amount of shrub steppe habitat loss compared to the large amount of summer and winter range habitat available would not result in a measurable effect to mule deer.

Disturbance at the Stukel quarry during the prairie falcon nesting season or excavation of the nest cliff could result in nest failure.

Wildlife project design features include the following:

1. A seasonal restriction of April 1- July 30 (or post fledging) from human caused disturbances that may cause nesting failure within 660 feet of the nest when nesting activity is confirmed.
2. Nest monitoring by a qualified individual should occur at the appropriate time of year to confirm nesting or non-nesting status.

CUMULATIVE EFFECTS

The current conditions on the land affected by the Proposed Action resulted from a multitude of natural and human actions that have taken place over many decades. A catalogue and

analysis, comparison, or description of all individual past actions and their effects which have contributed to the current environmental conditions would be difficult to compile. Cataloguing the effects of each of these individual past actions would not provide a clearer understanding of the existing environmental conditions. It is possible to implement more accurate ways to obtain the information concerning those past actions which are necessary for an analysis of the “impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions.” (See definition of “cumulative impact” in 40 CFR 1508.7.)

A description of the current state of the affected environment inherently includes the effects of past actions and serves as a more accurate and useful starting point for a cumulative effects analysis, rather than attempting to establish such a starting point by “adding up” the described effects of all individual past actions. The importance of “past actions” is to set the context for understanding the incremental effects of the Proposed action. This context is determined by combining the current conditions with available information on the expected effects of other present and reasonably foreseeable future actions. Here the cataloguing and analysis of the effects of other similar present and reasonably foreseeable actions is necessary and has been described below. By comparing the total effect of the no action alternative to the effects described when adding the Proposed Action or any action alternative, one can discern the incremental cumulative impact resulting from a given alternative.

DESCRIPTION OF OTHER RESOURCES

Resource values that are either not present in the project area, or would not be affected by any of the proposed alternatives are: floodplains, wilderness study areas (WSAs), areas of critical environmental concern (ACECs), research natural areas (RNAs), paleontological resources, prime or unique farmlands, wild and scenic rivers, fisheries, lands, air quality, and recreation and scenic values. There are no known hazardous waste sites in the analysis area. No direct or indirect disproportionately high or adverse human health or environmental effects to minority or low income populations are expected to result from implementation of the proposed action.

Cultural resource surveys were conducted and one archaeological site will be monitored. The location of the gate installation was previously surveyed and will not impact any sites. All identified cultural/historical resources within the project area would be avoided or potential impacts mitigated in accordance with BLM/SHPO requirements. Therefore, no adverse impacts are expected as a result of implementation of the proposed action.

PERSONS/AGENCIES CONSULTED

| | |
|-------------------------------|--------------------------|
| The Klamath Tribes | Livestock Lessee |
| Oregon Department of Forestry | Other Interested Parties |
| Klamath County | Adjacent Landowners |

PREPARERS

| | |
|-------------------|--------------------|
| Johanna Blanchard | Botanist |
| Steve Hayner | Wildlife Biologist |
| Andy Hamilton | Hydrologist |
| Sara Hescok | Archaeologist |

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| Dana Eckard | Rangeland Management Specialist |
| Debora Boudreau | Lands and Realty Specialist |
| Grant Weidenbach | Outdoor Recreation Planner |
| Terry Austin | Planning & Environmental Coordinator |
| Philip D'Amo | Project Lead/Lakeview District Geologist |

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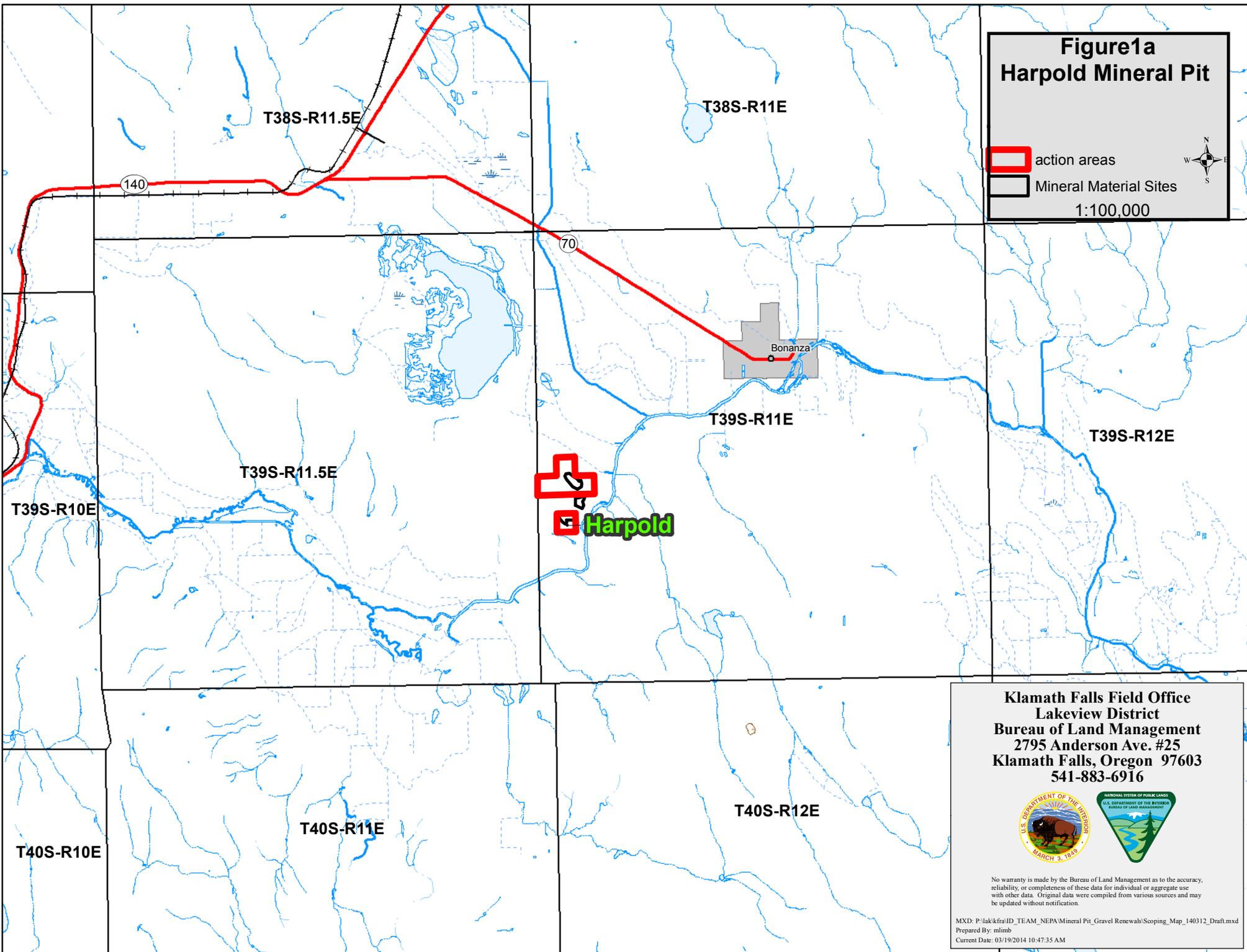
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**Figure1a
Harpold Mineral Pit**

 action areas

 Mineral Material Sites

1:100,000

**Klamath Falls Field Office
Lakeview District
Bureau of Land Management
2795 Anderson Ave. #25
Klamath Falls, Oregon 97603
541-883-6916**



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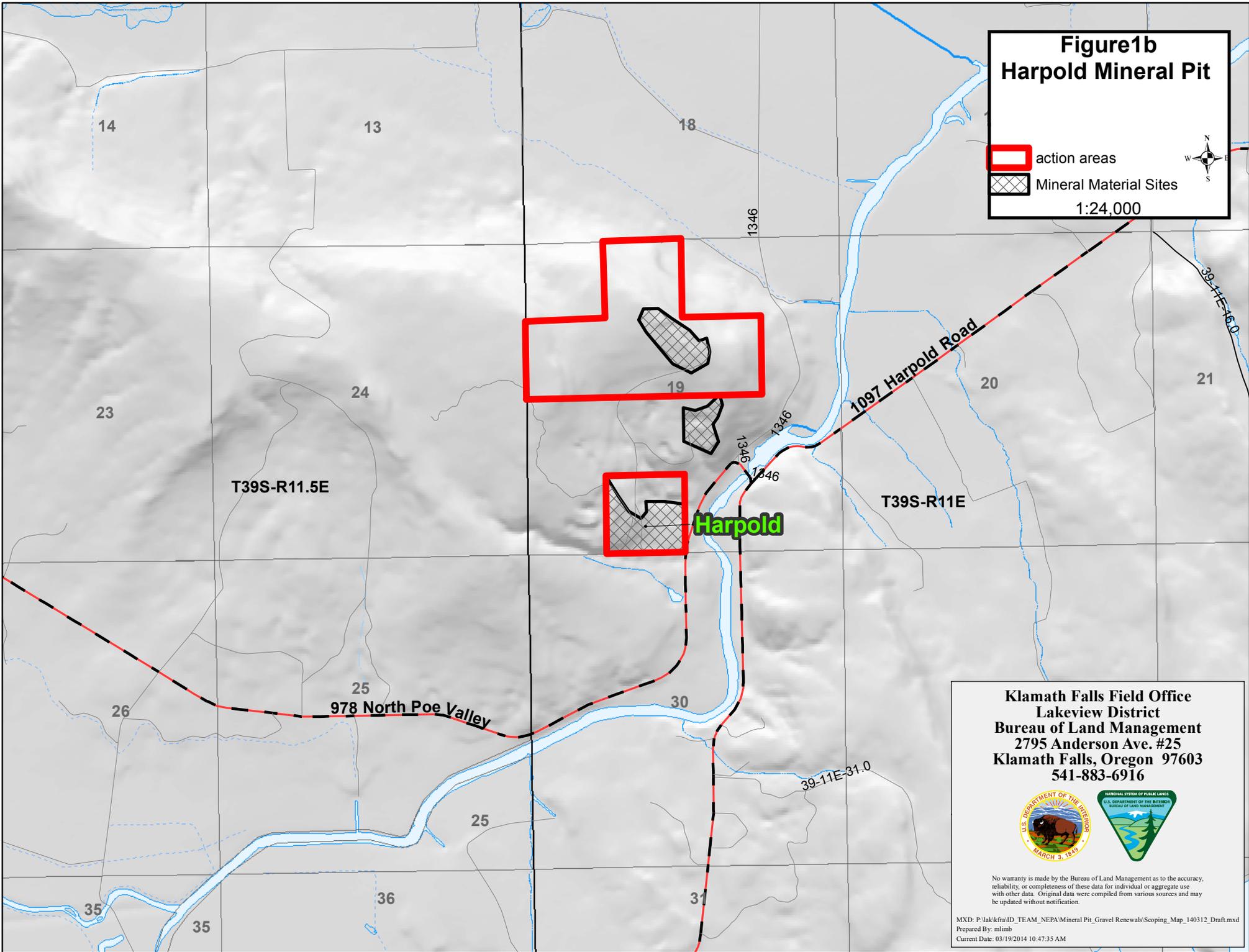
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Figure 1b
Harpold Mineral Pit

 action areas

 Mineral Material Sites

1:24,000

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2795 Anderson Ave. #25
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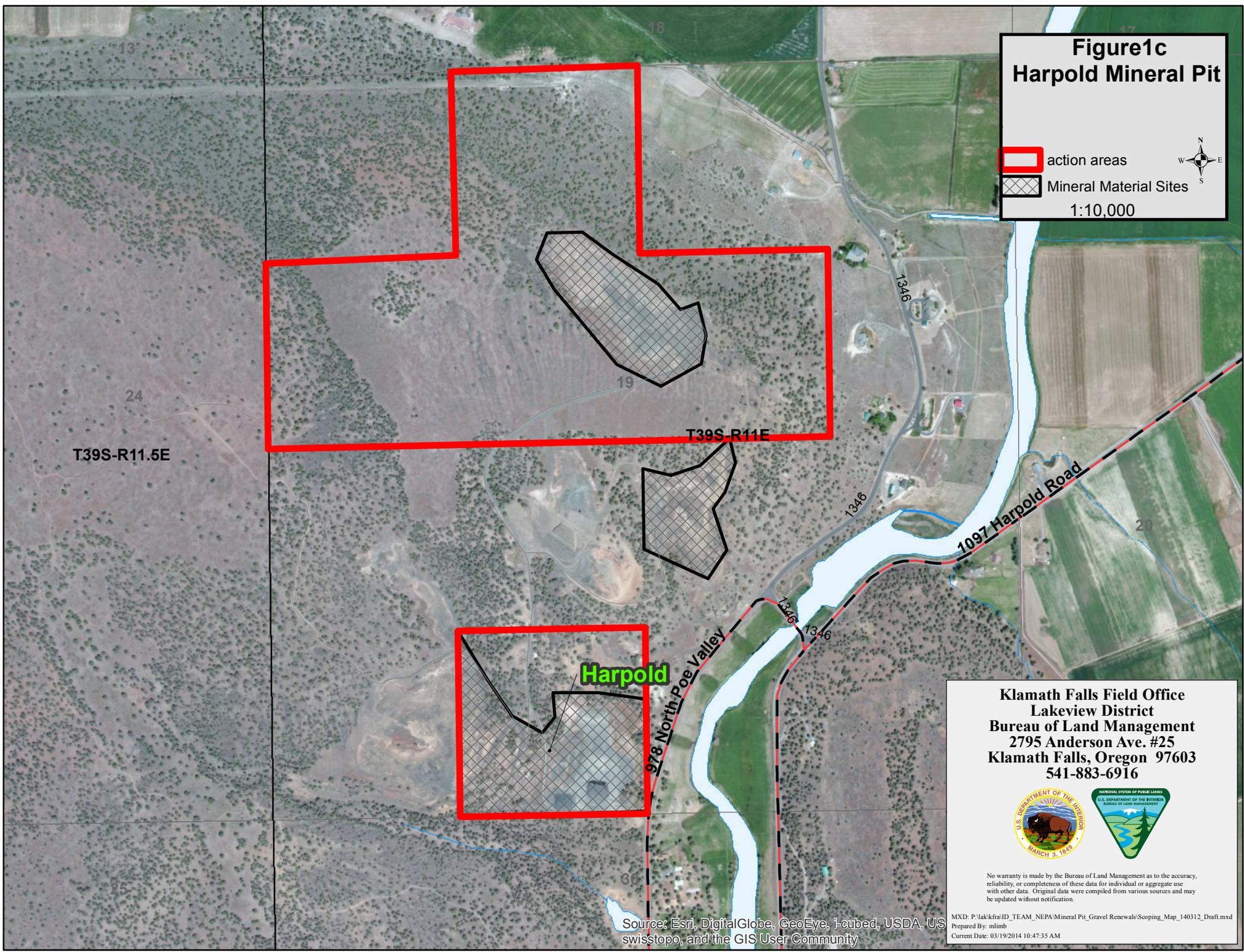
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Prepared By: mlmb
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Figure1c
Harpold Mineral Pit

 action areas

 Mineral Material Sites

1:10,000

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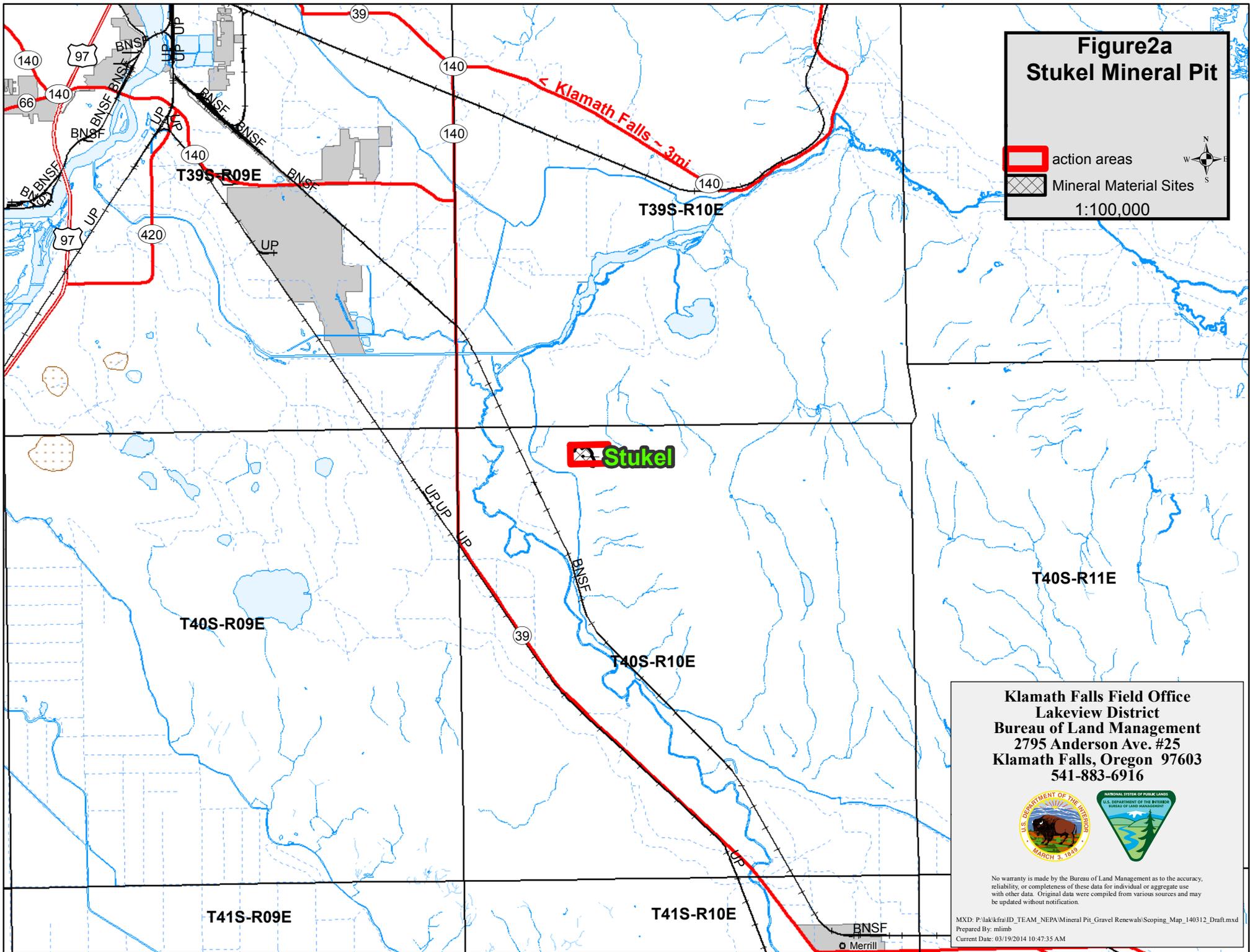

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Prepared By: mlmb
Current Date: 03/19/2014 10:47:35 AM

Source: Esri, DigitalGlobe, GeoEye, I-cubed, USDA, US swisstopo, and the GIS User Community

**Figure2a
Stukel Mineral Pit**

-  action areas
 -  Mineral Material Sites
- 1:100,000



**Klamath Falls Field Office
Lakeview District
Bureau of Land Management
2795 Anderson Ave. #25
Klamath Falls, Oregon 97603
541-883-6916**

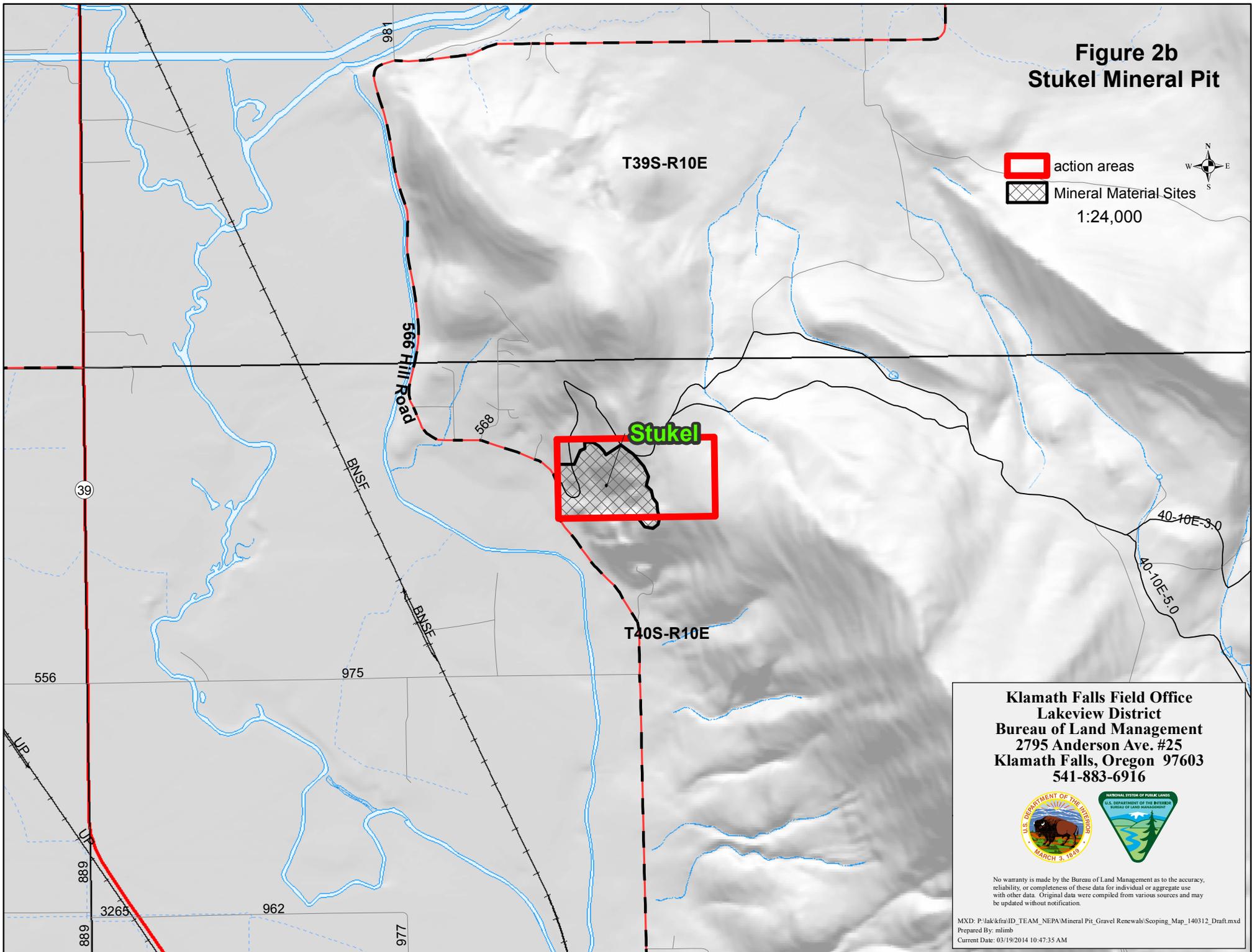


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**Figure 2b
Stukel Mineral Pit**



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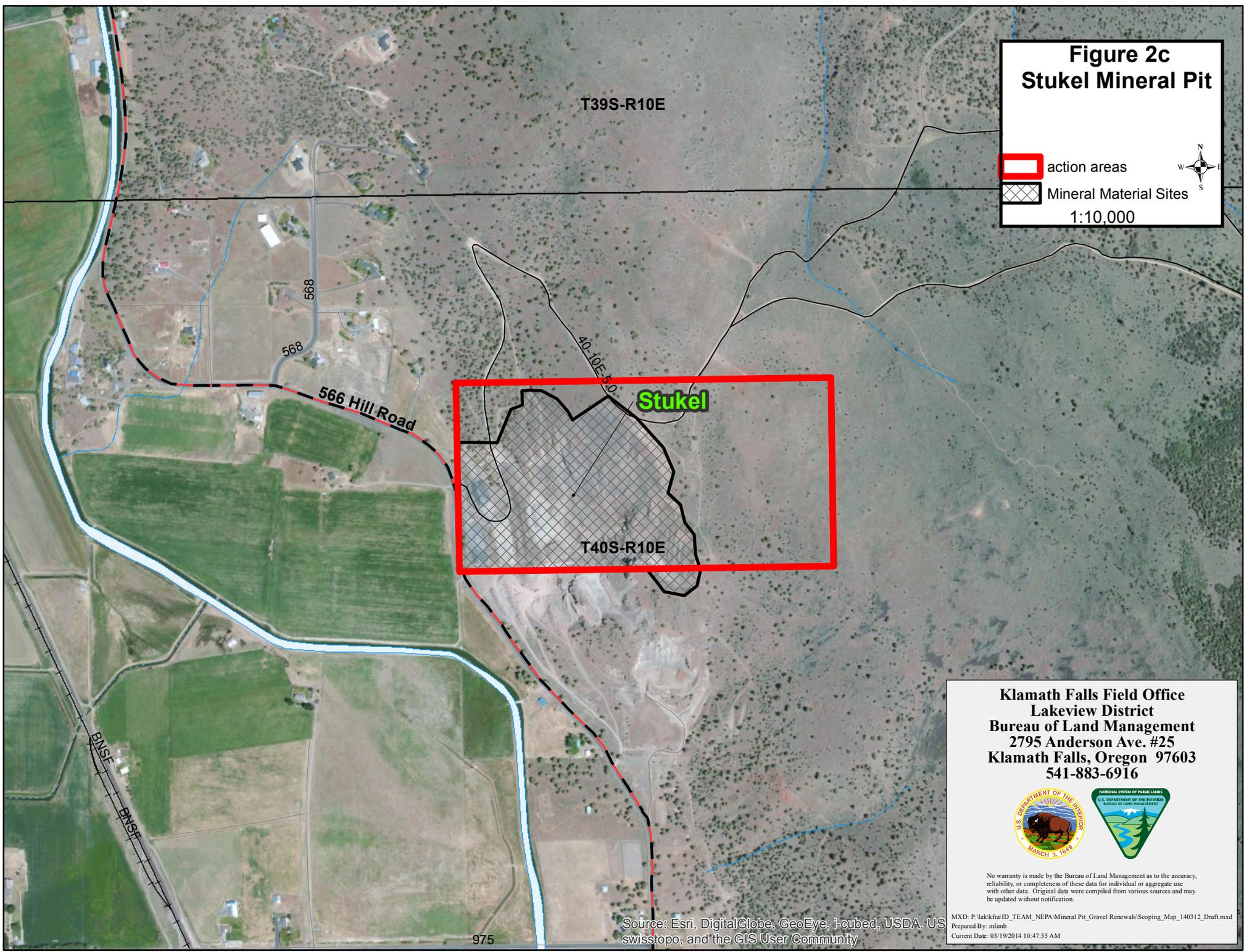


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Figure 2c Stukel Mineral Pit

 action areas
 Mineral Material Sites
1:10,000



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Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, US swisstopo, and the GIS User Community

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