

# ElkPt\_grades

**Type** File Geodatabase Feature Class



**Tags** potash resources, drill holes, thickness, wells, stratabound salt, grades, K<sub>2</sub>O, carnallite

## Summary

ElkPt\_grades-- Spatial database of select drill-hole and well data for grades of K<sub>2</sub>O and carnallite in the Prairie Evaporite, Canada.

The spatial database was created for use in a geographic information system (GIS) as part of a global potash resource assessment by the U.S. Geological Survey.

## Description

The Elk Point Basin is an evaporite basin of Middle Devonian age that contains a significant portion of the world's potash resources. Potash-bearing salt is concentrated in the upper 100 meters of the Prairie Evaporite in the Patience Lake, Belle Plaine, White Bear, and Esterhazy Members. Known potash mineralization is concentrated in the southeastern portion of the Elk Point Basin mainly in Saskatchewan and extending short distances into adjacent parts of Alberta, Manitoba, North Dakota, and Montana.

Permissive tracts were delineated by the extent of each member of the Prairie Evaporite where the member is at least 1 meter in thickness and less than 3 kilometers from the surface.

Potash resources were assessed for each tract using a method based on an enhanced geometric analysis of the likely spatial distribution of potash mineralization. We used Monte Carlo simulations to estimate missing or incomplete variables such as density, average grade, and geologic loss due to salt dissolution to calculate the distribution and abundance of estimated undiscovered potash (as K<sub>2</sub>O). Potash grades were calculated using both historic (1950s and 1960s) and recent (2007–2011) drill hole analyses. The mean estimated undiscovered K<sub>2</sub>O resource (which includes sylvite and carnallite) in these tracts is 864 billion metric tons.

Preferred reference:

Cocker, M.D., Orris, G.J., Dunlap, P., Yang, C., and Bliss, J.D., 2023, Geology and undiscovered resource assessment of the potash-bearing, Middle Devonian (Givetian), Prairie Evaporite, Elk Point Basin, Canada and United States: U.S. Geological Survey Scientific Investigations Report 2010–5090–CC, 145 p. and data files, <https://doi.org/10.3133/sir20105090cc>.

## Credits

Mark Cocker interpreted the data and is responsible for the scientific content.  
Pamela Dunlap processed the digital data and built the spatial database.

## Use limitations

None. The U.S. Geological Survey (USGS) provides these geographic data "as is." The USGS makes no guarantee or warranty concerning the accuracy of information contained in the geographic data. The USGS further makes no warranties, either expressed or implied as to any other matter whatsoever, including, without limitation, the condition of the product, or its fitness for any particular purpose. The burden for determining fitness for use lies entirely with the user. Although these data have been processed successfully on computers of the USGS, no warranty, expressed or implied, is made by the USGS regarding the use of these data on any other system, nor does the fact of distribution constitute or imply such warranty.

## Extent

West -109.503276    East -101.257701  
North 53.199470    South 49.569209

## Scale Range

Maximum (zoomed in) 1:5,000  
Minimum (zoomed out) 1:150,000,000

## Topics and Keywords ►

Content type ⇌ Downloadable Data

## Citation ►

Title ⇌ ElkPt\_grades

Alternate titles Grade of potash and carnallite within the permissive tracts

Presentation formats digital map

FGDC geospatial presentation format map

### Series

Name Scientific Investigations Report

Issue 2010-5090-CC

Collection title Geology and undiscovered resource assessment of the potash-bearing, Middle Devonian (Givetian), Prairie Evaporite, Elk Point Basin, Canada and United States

### Other citation details

Cocker, M.D., Orris, G.J., Dunlap, P., Yang, C., and Bliss, J.D., 2023, Geology and undiscovered resource assessment of the potash-bearing, Middle Devonian (Givetian), Prairie Evaporite, Elk Point Basin, Canada and United States: U.S. Geological Survey Scientific Investigations Report 2010–5090–CC, 145 p. and data files, <https://doi.org/10.3133/sir20105090cc>.

## Resource Details ►

Dataset languages English (UNITED STATES)

Spatial representation type vector

Processing environment ⇌ Microsoft Windows 7 Version 6.1 (Build 7601) Service Pack 1; Esri ArcGIS 10.2.1.3497

## Credits

Mark Cocker interpreted the data and is responsible for the scientific content.

Pamela Dunlap processed the digital data and built the spatial database.

## ArcGIS item properties

Name ⇔ ElkPt\_grades

Location ⇔ file://\\IGSWZEWMMWSPDUN2\E\$\ElkPoint\_revised2014April\ElkPoint\ElkPoint\_potash.gdb

Access protocol ⇔ Local Area Network

## Extents ►

### Extent

#### Geographic extent

##### Bounding rectangle

##### Extent type

#### Extent used for searching

West longitude ⇔ -109.503276

East longitude ⇔ -101.257701

North latitude ⇔ 53.199470

South latitude ⇔ 49.569209

Extent contains the resource ⇔ Yes

### Extent in the item's coordinate system

westBL ⇔ -905375.612424

eastBL ⇔ -374815.739092

southBL ⇔ 1133003.760969

northBL ⇔ 1468894.740768

exTypeCode ⇔ Yes

## Resource Maintenance ►

### Resource maintenance

Update frequency not planned

## Resource Constraints ►

### Constraints

#### Limitations of use

None. The U.S. Geological Survey (USGS) provides these geographic data "as is." The USGS makes no guarantee or warranty concerning the accuracy of information contained in the geographic data. The USGS further makes no warranties, either expressed or implied as to any other matter whatsoever, including, without limitation, the condition of the product, or its fitness for any particular purpose. The burden for determining fitness for use lies entirely with the user. Although these data have been processed successfully on computers of the USGS, no warranty, expressed or implied, is made by the USGS regarding the use of these data on any other system, nor does the fact of distribution constitute or imply such warranty.

## Spatial Reference ►

### ArcGIS coordinate system

Type ⇔ Projected

Geographic coordinate reference ⇔ GCS\_North\_American\_1983

Projection ⇔ Canada\_Albers\_Equal\_Area\_Conic

Coordinate reference details ⇔

ProjectedCoordinateSystem

WKID 102001

XOrigin -13825800

YOrigin -7913700

XYScale 325738809.13730091

ZOrigin -100000

ZScale 10000

MOrigin -100000

MScale 10000

XYTolerance 0.001

ZTolerance 0.001

MTolerance 0.001

HighPrecision true

LatestWKID 102001

WKT

PROJCS["Canada\_Albers\_Equal\_Area\_Conic",GEOGCS["GCS\_North\_American\_1983",DATUM["D\_North\_Amer

Reference system identifier

Value 102001

Codespace ⇔ ESRI

Version ⇔ 10.2.1

## Spatial Data Properties ►

Vector ►

Level of topology for this dataset ⇔ geometry only

Geometric objects

Feature class name ElkPt\_grades

Object type ⇔ point

Object count ⇔ 334

ArcGIS Feature Class Properties ►

Feature class name ElkPt\_grades

Feature type ⇔ Simple

Geometry type ⇔ Point

Has topology ⇔ FALSE

Feature count ⇔ 334

Spatial index ⇔ TRUE

Linear referencing ⇔ FALSE

## Lineage ►

Lineage statement

Grades of potash and carnallite were derived from representative well and drill-hole data, for use in computing potash resources listed in the feature class ElkPt\_tracts. [Data in ElkPt\_grades were not used in construction of the isopach map features classes in this report.]

Process step ►

When the process occurred 2011-11-14 00:00:00

Source data ►

Description

Lomas, Susan, 2008, National instrument 43-101 technical report for a resource estimation on the Burr project, Athabasca Potash Inc., Saskatchewan, Canada: North Vancouver, B.C., AMEC Americas Ltd, project no. 154334, 137 p.

Source medium name hardcopy—printing on paper

Source data ►

Description

Piché, L., Rauche, H., and van der Klauw, S., 2011, National instrument 43-101 technical report, resource estimate for the Wynyard Carnallite Project, subsurface mineral permit KP 360A and subsurface mineral lease KLSA 010, Saskatchewan, Canada: Okotoks, Alberta, Karnalyte Resources, Inc., 329 p.

Source medium name hardcopy—printing on paper

Source data ►

Description

Saskatchewan Ministry of Energy and Resources, 2010, Digital well log database: accessed January, 2010 , at <http://www.dwd.gov.sk.ca/Pages/BasePages/Main.aspx?UseCase=ExternalWellSearch>.

Source medium name online link

Source data ►

Description

Western Potash Corp., 2008a, Western Potash Corp. announces assay results from first four potash exploration wells from its Russell Miniota project: Vancouver, B.C., Western Potash Corp. press release, September 25, 2008, 3 p., accessed January 4, 2010, at <http://www.westernpotash.com/news/announces-assay-results-first-four-potash-exploration-wells-russell-miniota-project>.

Source medium name online link

Source data ►

Description

Western Potash Corp., 2008b, WPX reports results from fifth exploration well on the Russell-Miniota property and start of drilling on the QP-168/172: Vancouver, B.C., Western Potash Corp. press release, October 22, 2008, 2 p., accessed January 4, 2010 at <http://www.westernpotash.com/news/wpx-reports-results-fifth-exploration-well-russell-miniota-property-and-start-drilling-qp-16817>.

Source medium name online link

Source data ►

## Description

Western Potash Corp., 2008c, WPX reports results from the sixth and seventh exploration wells on the Russell-Miniota property: Vancouver, B.C., Western Potash Corp. press release, December 2, 2008, 3 p., accessed January 4, 2010, at <http://www.westernpotash.com/news/wpx-reports-results-sixth-and-seventh-exploration-wells-russell-miniota-property>.

Source medium name   online link

## Source data ►

### Description

Western Potash Corp., 2009, WPX intersects 19.9 % K<sub>2</sub>O over 22.25m with little or no carnallite, providing an update on expanded resource definition drilling and seismic program: Vancouver, B.C., Western Potash Corp. press release, December 3, 2009, 1 p., accessed July 16, 2010, at [http://www.westernpotash.com/news/wpx-intersects-199-k<sub>2</sub>o-over-2225m-little-or-no-carnallite-providing-update-expanded-resource-de](http://www.westernpotash.com/news/wpx-intersects-199-k2o-over-2225m-little-or-no-carnallite-providing-update-expanded-resource-de).

Source medium name   online link

## Distribution ►

### Distributor ►

#### Contact information - distributor

Organization's name   U.S. Geological Survey

#### Contact information ►

##### Phone

Voice   1-888-275-8747

Voice   1-888-ASK-USGS

##### Address

Type   postal

Delivery point   Denver Federal Center, P.O. Box 25286

City   Denver

Administrative area   Colorado

Postal code   80225

e-mail address   [infoservices@usgs.gov](mailto:infoservices@usgs.gov)

### Transfer options

#### Online source

Online location (URL)   <https://doi.org/10.3133/sir20105090cc>

Function performed   download

### Distribution format

Name   ⇔ File Geodatabase Feature Class

Version   ArcGIS 10

Specification   GIS\_ElkPt\_potash.zip

File decompression technique   To open a zipped file, double-click on the zipped file listed in My Computer or Windows Explorer, drag and drop the zipped file onto WINZIP, or use the standard Open dialogue box.

Format information content   ElkPt\_potash.gdb and metadata

## Fields ►

### Details for object ElkPt\_grades ►

Type ⇔ Feature Class

Row count ⇔ 334

#### Field OBJECTID ►

Alias ⇔ OBJECTID

Data type ⇔ OID

Width ⇔ 4

Precision ⇔ 0

Scale ⇔ 0

Field description ⇔

Internal feature number.

Description source ⇔

ESRI

Description of values ⇔

Sequential unique whole numbers that are automatically generated.

#### Field REC\_NO ►

Alias ⇔ REC\_NO

Data type ⇔ Double

Width ⇔ 8

Precision ⇔ 0

Scale ⇔ 0

Field description

Unique record identifier

#### Field Shape ►

Alias ⇔ Shape

Data type ⇔ Geometry

Width ⇔ 0

Precision ⇔ 0

Scale ⇔ 0

Field description ⇔

Feature geometry.

Description source ⇔

ESRI

Description of values ⇔

Coordinates defining the features.

#### Field WELL\_ID ►

Alias    ⇔ WELL\_ID  
Data type    ⇔ String  
Width    ⇔ 30  
Precision    ⇔ 0  
Scale    ⇔ 0

Field description  
Well or drill hole identifier.

Field LATITUDE ►

Alias    ⇔ LATITUDE  
Data type    ⇔ Double  
Width    ⇔ 8  
Precision    ⇔ 0  
Scale    ⇔ 0

Field description  
Latitude, positive number indicates latitude north of the equator.

Field LONGITUDE ►

Alias    ⇔ LONGITUDE  
Data type    ⇔ Double  
Width    ⇔ 8  
Precision    ⇔ 0  
Scale    ⇔ 0

Field description  
Longitude, negative number indicates longitude west of the Greenwich meridian.

Field MEMBER ►

Alias    ⇔ MEMBER  
Data type    ⇔ String  
Width    ⇔ 20  
Precision    ⇔ 0  
Scale    ⇔ 0

Field description  
Member of the Prairie Evaporite for which grades were determined.

List of values

Value    Belle Plaine  
Description    Belle Plaine Member

Value    Esterhazy  
Description    Esterhazy Member

Value    Patience Lake  
Description    Patience Lake Member



Value White Bear  
Description White Bear Member

Field THK\_INT\_M ►

Alias ⇔ THK\_INT\_M  
Data type ⇔ Double  
Width ⇔ 8  
Precision ⇔ 0  
Scale ⇔ 0

Field description

THICKNESS INTERVAL in Meters -- Thickness of interval for which grades were determined.

Range of values

Minimum value 0.56  
Maximum value 92.93  
Units of measure meters

Field AV\_K2O\_PCT ►

Alias ⇔ AV\_K2O\_PCT  
Data type ⇔ Double  
Width ⇔ 8  
Precision ⇔ 0  
Scale ⇔ 0

Field description

Average grade of potash (K2O), in percent.

Field AV\_CAR\_PCT ►

Alias ⇔ AV\_CAR\_PCT  
Data type ⇔ Double  
Width ⇔ 8  
Precision ⇔ 0  
Scale ⇔ 0

Field description

Average grade of carnallite, in percent.

List of values

Value NULL  
Description Null value indicates no data.

Field SHORT\_REF ►

Alias ⇔ SHORT\_REF  
Data type ⇔ String  
Width ⇔ 60  
Precision ⇔ 0

Scale ⇔ 0

#### Field description

Abbreviated source reference, author and year.

#### List of values

Value Lomas (2008)

Description Lomas, Susan, 2008, National instrument 43-101 technical report for a resource estimation on the Burr project, Athabasca Potash Inc., Saskatchewan, Canada: North Vancouver, B.C., AMEC Americas Ltd, project no. 154334, 137 p.

Value Piché and others (2011)

Description Piché, L., Rauche, H., and van der Klauw, S., 2011, National instrument 43-101 technical report, resource estimate for the Wynyard Carnallite Project, subsurface mineral permit KP 360A and subsurface mineral lease KLSA 010, Saskatchewan, Canada: Okotoks, Alberta, Karnalyte Resources, Inc., 329 p.

Value Saskatchewan Ministry of Energy and Resources (2010)

Description Saskatchewan Ministry of Energy and Resources, 2010, Digital well log database: accessed January, 2010 , at <http://www.dwd.gov.sk.ca/Pages/BasePages/Main.aspx?UseCase=ExternalWellSearch>

Value Western Potash Corp. (2008a)

Description Western Potash Corp., 2008, Western Potash Corp. announces assay results from first four potash exploration wells from its Russell Miniota project: Vancouver, B.C., Western Potash Corp. press release, September 25, 2008, 3 p., accessed January 4, 2010, at <http://www.westernpotash.com/news/announces-assay-results-first-four-potash-exploration-wells-russell-miniota-project>.

Value Western Potash Corp. (2008b)

Description Western Potash Corp., 2008, WPX reports results from fifth exploration well on the Russell-Miniota property and start of drilling on the QP-168/172: Vancouver, B.C., Western Potash Corp. press release, October 22, 2008, 2 p., accessed January 4, 2010 at <http://www.westernpotash.com/news/wpx-reports-results-fifth-exploration-well-russell-miniota-property-and-start-drilling-qp-16817>.

Value Western Potash Corp. (2008c)

Description Western Potash Corp., 2008, WPX reports results from the sixth and seventh exploration wells on the Russell-Miniota property: Vancouver, B.C., Western Potash Corp. press release, December 2, 2008, 3 p., accessed January 4, 2010, at <http://www.westernpotash.com/news/wpx-reports-results-sixth-and-seventh-exploration-wells-russell-miniota-property>.

Value Western Potash Corp. (2009)

Description Western Potash Corp., 2009, WPX intersects 19.9 % K<sub>2</sub>O over 22.25m with little or no carnallite, providing an update on expanded resource definition drilling and seismic program: Vancouver, B.C., Western Potash Corp. press release, December 3, 2009, 1 p., accessed July 16, 2010, at <http://www.westernpotash.com/news/wpx-intersects-199-k2o-over-2225m-little-or-no-carnallite-providing-update-expanded-resource-de>.

#### Field REFERENCE ►

Alias ⇔ REFERENCE

Data type ⇔ String

Width ⇔ 450

Precision ⇔ 0

Scale ⇔ 0

Field description  
Full source citation.

## Metadata Details ►

Metadata language English (UNITED STATES)

Scope of the data described by the metadata dataset  
Scope name ⇔ dataset

Last update ⇔ 2023-09-12

### ArcGIS metadata properties

Metadata format ArcGIS 1.0  
Metadata style FGDC CSDGM Metadata  
Standard or profile used to edit metadata FGDC

Created in ArcGIS for the item 2011-11-01 13:19:06  
Last modified in ArcGIS for the item 2023-09-12 14:22:45

### Automatic updates

Have been performed Yes  
Last update 2014-04-07 15:11:05

## Metadata Contacts ►

### Metadata contact - author

Individual's name Pamela Dunlap  
Organization's name U.S. Geological Survey  
Contact's position Geologist

### Contact information ►

#### Phone

Voice 1-520-670-5573

#### Address

Type postal  
Delivery point 520 N Park Ave., Ste. 355  
City Tucson  
Administrative area Arizona  
Postal code 85719  
Country US  
e-mail address [pdunlap@usgs.gov](mailto:pdunlap@usgs.gov)

## Metadata Maintenance ►

### Maintenance

Update frequency not planned

## Thumbnail and Enclosures ►

Thumbnail

Thumbnail type  
Image file