114°15′ <sup>723</sup>

**Base Map Credit** 

Shaded elevation from 10 m DEM.

Mercator). 1927 North American Datum.

Base scanned from 24,000-scale USGS film positive, 1979.

photographs taken 1971. Field checked 1973. Map edited

Projection: Idaho coordinate system, central zone (Transverse

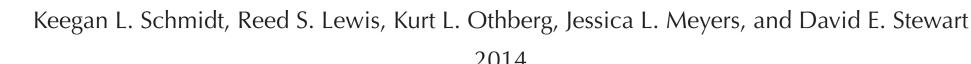
1000-meter Universal Transverse Mercator grid ticks, zone 11.

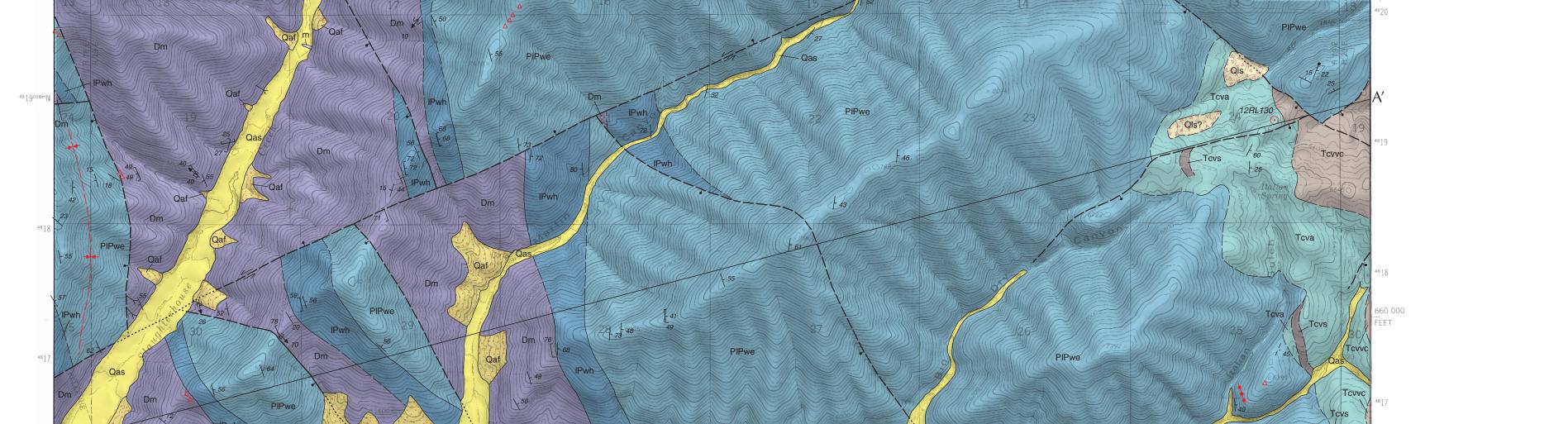
Declination from NOAA National Geophysical Data Center.

Topography by photogrammetric methods from aerial

10,000-foot grid ticks based on Idaho coordinate system,

# Geologic Map of the Seamans Creek Quadrangle, Blaine County, Idaho





# INTRODUCTION

The map is the result of field work in 2012, as well as a compilation of previous research, including that of Schmidt (1961, 1962), Link and others (1995), and Worl and others (1991). During the 2000-2003 Wood River Valley STATEMAP project, Breckenridge and others sampled basalt units in the area for dating and paleomagnetic analysis (Breckenridge and others, 2003). Breckenridge and Othberg (2006) mapped the surficial geology of the adjacent Bellevue quadrangle. Kauffman and Othberg (2007) mapped the adjacent Magic Reservoir East quadrangle and revised some of Schmidt's stratigraphy. Garwood and others (2010, 2011) mapped the adjacent Gannett and Picabo quadrangles, to the south and southeast, respectively, and Hall and Batchelder (1979) mapped the adjacent Baugh Creek SW quadrangle to the north. Sanford (2005) defined and mapped the Challis Volcanic Group stratigraphy to the east of the present quadrangle. Soils information is from Johnson (1991).

The geologic map of the Seamans Creek quadrangle shows rock units exposed at the surface or underlying thin surficial cover of soil and colluvium. Thicker surficial alluvial and landslide deposits are shown where they form significant mappable units. The broad lowland of the west-southwest part of the map is covered by alluvial deposits hundreds of feet thick. Paleozoic sedimentary rocks to the east are overlain by Cenozoic volcanic and volcaniclastic rocks and surficial sediments. The Paleozoic rocks belong to the Devonian Milligen Formation and Pennsylvanian-Permian Sun Valley Group (Mahoney and others, 1991; and Link and others, 1995). Most of the volcanic and volcaniclastic rocks belong to the Eocene Challis Volcanic Group; some form part of the Miocene Idavada Group associated with formation of the Snake River Plain to the south.

Geologic structures on the quadrangle include mainly high-angle normal faults and relatively minor folds. The oldest deformation is preserved as small- to medium-scale close to isoclinal folding of variable orientation in rocks of the Devonian Milligen Formation associated with the Devonian-Mississippian Antler orogeny (Rodgers and others, 1995). Following deposition of the Pennsylvanian-Permian Sun Valley Group rocks on the angular unconformity developed on folded rocks of the Milligen Formation, the entire Paleozoic sedimentary sequence was tilted to form an east-northeast-dipping homocline with only locally developed upright folds. The uncommon folds are mostly northwest-trending and are best exposed in the southern part of the quadrangle. Rare east- and northeasttrending upright to overturned folds occur north and south of Lookout Mountain in the western part of the map. Tilting and folding of Paleozoic rocks probably occurred during the Jurassic-Cretaceous Sevier orogeny (Rodgers and others, 1995). The main style of faulting on the quadrangle is steeply southwest-dipping, northwest-striking normal faults. These faults offset Eocene Challis volcanic rocks and are probably associated with Neogene Basin and Range tectonism (Rodgers and others, 1995). The youngest faults include a major steeply dipping northeast-striking structure in the northwestern part of the map, which mainly accommodates left-lateral strike-slip displacement.

# SYMBOLS

### — Contact: dashed where approximately located. ······ Normal fault: ball and bar on downthrown side; dashed where

approximately located; dotted where concealed. Fault with strike-slip and normal motion: ball and bar on downthrown side; dashed where approximately located; dotted where

Anticline.

Overturned anticline

Overturned syncline.

\ 85 Strike and dip of bedding Estimated strike and dip of bedding.

• Strike and dip of bedding where sedimentary structures show bedding to be upright.

Strike and dip of overturned bedding.

 ★ Strike of vertical bedding. Strike and dip of flow or compaction foliation.

40 ∕ Strike and dip of cleavage.

Hearing and plunge of small fold axis.

Bearing and plunge of asymmetrical small "Z" fold showing clockwise rotation viewed down plunge.

 $\triangle$  Intensely fractured or brecciated rock associated with faulting.

••• Quartz vein.

Mine adit (mostly caved).

Gravel pit. ——— — Micrite marker bed.

# 12KS021 Location of geochemical sample.

# **ARTIFICIAL DEPOSITS**

DESCRIPTION OF MAP UNITS

m Man-made ground (Holocene)—Artificial fills composed of excavated, transported, and emplaced construction materials typically derived locally. Primarily berms and small dams for artificial ponds and lakes.

# SEDIMENTARY AND MASS WASTING DEPOSITS

# **Alluvial Deposits**

Alluvium of side streams and local drainages (Holocene)—Stratified clay, silt, sand, and fine gravel in numerous spring-fed streams that form Seamans Creek and its tributaries. Thickness generally less than 6 m (20 ft).

• Qaf • Alluvial-fan deposits (Holocene and Pleistocene)—Primarily poorly sorted silty,

clayey sand and pebble-cobble gravel in undissected and slightly dissected

Pinedale gravels of Schmidt (1961; 1962) and the Boulder Creek outwash

thick beds of sand, silt, and clay. See discussion by Garwood and others

fans. Thickness highly variable, ranging from 1.5 to 7.5 m (5 to 25 ft).

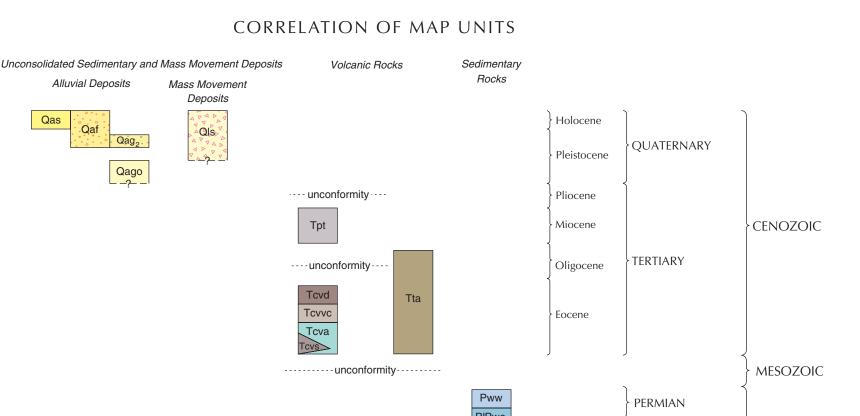
Qag. Alluvial gravel terrace deposits, 2nd terrace (Pleistocene)—Sandy pebble and cobble gravel; mostly rounded clasts; grain size generally decreases southward and southeastward to silty, sandy, small pebble gravel. Moderate sorting; mostly thick bedded with some cross bedding. Terrace is 3-9 m (10-30 ft) above present Big Wood River floodplain in the adjacent Gannett and Magic Reservoir East quadrangles. Forms surface of prominent outwash fan deposited by the Big Wood River during late Wisconsin alpine glaciation in the headwaters of the Boulder and Pioneer mountains. Equivalent to

gravels of Pearce and others (1988). Thickness shown in cross section estimated from water-well records in adjacent Gannett quadrangle (Garwood and others, 2010). Qago Alluvial gravel terrace deposits, older undivided (Pleistocene)—Shown only in cross section. Coarse to fine gravel alternating and intertonging with thin to

Mass Movement Deposits Landslide deposits (Holocene and Pleistocene)—Poorly sorted and poorly stratified angular cobbles and boulders mixed with silt and clay. Deposited

by slumps, slides, and debris flows.

(2010) in adjoining Gannett quadrangle to the south.



### Idavada Group

**VOLCANIC ROCKS** 

Tpt | Picabo tuff (Miocene)—Light gray, tan, and purplish tan crystal-poor rhyolite tuff. Phenocrysts of plagioclase compose less than 5 percent of the rock. Commonly has compaction foliation layers spaced 1-3 mm. Probably consists of several ash flows or cooling units as indicated by vitrophyric layers and associated zones with irregularly shaped lithophysal cavities from several centimeters to tens of centimeters in size, and by compositional and textural variants. The lithophysal zones commonly form ledges 2-10 m (6-30 ft) high. The unit weathers into granular fragments. Mostly caps ridges in the southeast part of the map. Extruded onto irregular topography of Challis Volcanic Group and Paleozoic sedimentary rocks. Equivalent to the Picabo tuff of Schmidt (1961). Honjo and others (1986) obtained a K-Ar date on plagioclase for Picabo-B unit (Schmidt, 1961) of  $8.98 \pm 0.12$ Ma. Chemical composition of samples (Table 1) are similar to the one reported for the Gwin Spring tuff in the Spring Creek Reservoir quadrangle near Fairfield (Othberg and Kauffman, 2009). Unit continues to the south where it mainly caps ridges in the Magic Reservoir East (Kauffman and Othberg, 2007), Gannett (Garwood and others, 2010), and Picabo (Garwood and others, 2011) quadrangles.

### Volcanics of Uncertain Age

Tta Trachyandesite (Miocene? to Eocene?)—Dark gray, fine- to medium-grained trachyandesite with common phenocrysts of augite and olivine as large as 0.5 cm across and less common plagioclase phenocrysts as long as 2 mm. Relatively unaltered: source is unknown. Occupies only areas north of Cove Creek in the southern half of the map where it overlies rocks of the Challis Volcanic Group and Paleozoic rocks. Commonly perched on hills and ridges and occupies remnant paleodrainages. Relationship to unit *Tpt* is undetermined. May be a young unit of the Eocene Challis Volcanic Group or a younger Miocene flow. Unit appears to be chemically equivalent to some flows in the Challis pyroxene andesite unit (Tcpa) in the Buttercup Mountain quadrangle (O'Brien and others, 1993) to the northwest.

### Challis Volcanic Group

Tcvd Dacite (Eocene)—Mostly medium to dark gray, pink, or purple biotitehornblende porphyritic dacite. Plagioclase phenocrysts common to abundant; hornblende and biotite phenocrysts uncommon to common and in places altered and oxidized. Quartz is uncommon and typically resorbed. Typically has wavy compaction(?) foliation layers several millimeters thick. A distinctive lithology in this unit is white to light-gray, locally trachytic, acicular hornblende quartz plagioclase crystal tuff. Fossil wood is preserved in some outcrops of the tuff. Also, locally common are breccias with pale (altered?) multi-colored fragments or jade-colored clasts. Unit includes uncommon hornblende andesite lava flows, vesicular hornblende plagioclase vitrophyre, pink plagioclase-quartz-biotite heterolithologic lithic tuff, and lahar deposits with dacite blocks in sandy matrix. Patterned area on map indicates massive, generally more porphyritic hornblende biotite dacite. Point 6149 east of Dry Creek exposes classic example of this lithology. Similar dacite volcanic rocks lie on mostly andesite lava rocks in the Little Wood River quadrangle to the east, where they form a series of large lava flow domes (Sanford, 2005).

Tovvo Hornblende-bearing volcaniclastic rocks (Eocene)—Light gray to tan massive sedimentary breccia. Very poorly sorted matrix-supported breccia containing muddy to sandy (crystal-bearing) matrix. Clasts are angular, as large as 1.5 m (5 ft), and are dominated by hornblende- and (or) biotite-bearing dacite and andesite possibly derived from units Tcvd and Tcva. Unit locally attains thickness of 90 m (300 ft) and consists of multiple deposits of different ages that are intercalated with dacite and andesite lava flow rocks. These layers are difficult to correlate across the area but appear to be older than the most massive exposures of *Tcvd*. Sanford (2005) mapped this unit as volcaniclastic sandstone and conglomerate containing interlayered dacite lavas and uncommon volcaniclastics near Muldoon Summit at the head of Seamans Creek in the eastern edge of the quadrangle.

Tcva Andesite and tuff (Eocene)—Brown-weathering dark greenish gray andesitic lava rocks and uncommon light gray tuffs. Andesitic lava rocks contain common augite pyroxene phenocrysts as large as 0.25 mm and less common plagioclase and altered olivine phenocrysts. Includes Shoshonite flows (Table 1). Siliceous biotite quartz crystal tuff and uncommon coarsegrained pumice lithic crystal rhyolite tuff forms layers 1.2-1.5 m (4-5 ft) thick that are intercalated with andesite lava flow rocks. Some tuffs may be water lain or reworked. Unit lies in angular unconformity on Paleozoic sedimentary rocks. Unit forms part of the lower andesite unit of Sanford (2005) that continues east into the Little Wood River Reservoir quadrangle.

Tcvs Challis sediments (Eocene)—Poorly exposed, light gray to greenish tan epiclastic pebble conglomerate, sandstone, siltstone, and claystone. Bedding varies from massive to finely laminated and graded bedding is common. Clasts are as large as 10 cm in size and are angular to subrounded, consisting of feldspar, quartz, biotite, hornblende, and volcanic and sedimentary rocks. Black chert clasts are particularly common. Pebble conglomerate is matrix supported. In outcrops located in upper Seamans Creek, unit is intercalated with andesite lava rocks of unit Tcva. Remnants of unit also occur locally on ridges to the west of these outcrops where black chert pebbles are found in float lying on unit PIPwe. Mapped as volcaniclastic sandstone and conglomerate in basal conglomerate andesite units of

# PALEOZOIC SEDIMENTARY ROCKS

Wood River Formation of the Sun Valley Group Paleozoic sedimentary rocks were mapped in the quadrangle using subdivisions of Mahoney and others (1991) and Link and others (1995).

Pww Wilson Creek Member (Permian)—Light brown silty micritic limestone, light to dark grav sandy micritic limestone, and subordinate light brown, mediumbedded micritic sandstone and dark-gray carbonaceous siltstone. Includes distinctive beds of tan to black, burrowed, trough cross- and convolutelaminated sandy and silty micrite grading upward to more massive tan limy siltstone. Fossils include crinoid columnals, fusilinids, corals, and the trace fossil Scalarituba (Fig. 1). On the northern ridge of Bell Mountain, located in the adjacent Little Wood River Reservoir quadrangle, black argillite, light gray limestone, well-bedded micritic sandstone and siltstone, and pebble conglomerate containing quartzite, sandstone, chert, and limestone clasts were tentatively assigned to this unit. Top of unit is not exposed. Outcrop area on the map is modified from Worl and others (1991)

PPwe Eagle Creek Member (Permian and Pennsylvanian)—Light purple to tan silty micritic limestone, light brown micritic sandstone, light gray sandy micritic limestone, and subordinate light tan sandstone. Lower and upper parts consist of thin- to medium-bedded silty micritic limestone and sandy micritic limestone. In places, silty micrite is finely laminated and contains cross beds and graded beds. Locally contains distinctive beds of dark gray and tan trough cross- and convolute-laminated sandy and silty micrite grading upward to more massive tan limy siltstone. Lower part of unit contains a distinctive marker bed 0-6 m (0-20 ft) thick of thinly laminated dark gray silty micrite that was mapped in the western part of the quadrangle. Middle part consists of mostly medium-bedded, fine- to mediumgrained micritic sandstone and less common non calcareous medium- to thick-bedded, fine-grained sandstone containing about 10-15 percent potassium feldspar.

Pwh Hailey Member (Pennsylvanian)—Gray to reddish brown, conglomerate, sandstone, and bioclastic limestone. Basal conglomerate lithofacies consists of medium-bedded to massive matrix- and clast-supported pebble to cobble calcareous conglomerate intercalated with subordinate thin- to medium-bedded, poorly to moderately sorted, fine- to coarse-grained calcareous sandstone. Conglomerate clasts are subangular to rounded, and consist of light gray to tan quartzite and sandstone, dark gray to black chert, dark gray argillite and siltstone, and light gray limestone. Upper limestone facies consists of thin- to medium-bedded bioclastic grainstone, packstone, and in situ biostromes intercalated with micritic sandstone, siltstone, and thinly bedded pebble and granule conglomerate. Fossils include horn corals, tabulate corals, crinoid columnals, pelecypods, and fusilinids. The Hailey Member lies in angular unconformity on folded rocks of the underlying Milligen Formation (Dm) and is locally absent.

## **DEVONIAN ROCKS**

PENNSYLVANIAN

MISSISSIPPIAN

DEVONIAN

PALEOZOIC

rocks of the Wood River Formation.

Digital Web Map 117, scale 1:24,000.

79-1617, scale 1:24,000.

scale 1:24,000.

Dm Milligen Formation (Devonian)—Dark brown to black, thinly laminated to medium-bedded, chert, argillite, and phyllitic siltstone. Thinly bedded black chert and argillite is typically intercalated with laminated gray to varicolored phyllite. Thinly bedded, pink phyllitic siltstone and fine- to medium- grained sandstone is also common and is locally limy. Uncommon limestone beds as thick as 30 cm. Mine dumps of Milligen Formation rocks are conspicuously black colored. Base of unit is not exposed. Unit contains common centimeter- to meter-scale close to isoclinal folds of variable orientation. The age of folding predates deposition of overlying

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Figure 1. Trace fossil Scalarituba in silty micrite of the Permian Wilson Creek Member of the Wood River Formation (Mahoney and others, 1991) east of Sharps Canyon in the eastern part of the map.

Disclaimer: Although this map was compiled from digital data that was successfully processed on a computer system using AutoCAD and ESRI ArcGIS software at the Idaho Geological Survey (IGS), no warranty, expressed or implied, is made by the IGS regarding the unity of the data on any other system, nor shall the act of distribution constitute any such warranty. The IGS does not guarantee this map or digital data to be free of errors nor assume liability for interpretations made from this map or digital data, or decisions

# Table 1. Major oxide and trace element chemistry of samples collected in the Seamans Creek quadrangle.

Major elements in weight percent

Sample					Мар																										
number	Latitude	Longitude	Rock name	Unit name	unit	SiO <sub>2</sub> TiO <sub>2</sub>	$Al_2O_3$	FeO	MnO	MgO	CaO	Na <sub>2</sub> O	$K_2O$	$P_2O_5$	Sum	Ni	Cr	Sc	V	Ва	Rb S	Sr	Zr	Υ	Nb	Ga Cu	Zn	Pb L	а Се	. Th	Nd U
12RL122a	43.3855	-114.1415	rhyolite tuff	Picabo tuff	Tpt	73.01 0.538	12.34	3.43	0.049	0.18	0.97	2.93	4.88	0.079	98.40	2	5	6	11	1209	165	79 6	20	79	49.6	19 4	74	27 9	4 148	3 27	74 8
12RL130	43.4913	-114.1341	Shoshonite	Andesite and tuff	Tcva	53.91 1.000	13.42	8.16	0.154	6.34	8.64	3.38	2.29	0.461	97.74	64	284	23	197	1477	48 8	78 1	94	24	19.6	18 67	85	14 5	5 111	1 9	49 3
12KS021	43.4076	-114.1524	latite-andesite	Trachyandesite	Tta	56.82 0.959	15.46	7.77	0.150	3.68	6.10	2.77	3.78	0.432	97.93	19	64	19	190	2180	114 10	19 1	95	26	20.2	20 43	88	20 5	6 103	3 10	47 4
12KS027	43.4234	-114.1766	Shoshonite	Trachyandesite	Tta	54.53 0.883	13.39	8.23	0.172	6.70	7.94	2.79	3.38	0.465	98.47	70	331	24	188	2114	73 10	02 1	75	24	15.9	17 72	87	18 5	3 101	1 10	47 4

All analyses performed at Washington State University GeoAnalytical Laboratory, Pullman, Washington.

# PIPwe

QUADRANGLE LOCATION ADJOINING OUADRANGLES

SCALE 1:24,000

Contour interval 40 feet

Supplemental contour interval 20 feet

Published and sold by the Idaho Geological Survey University of Idaho, Moscow, Idaho 83844-3014

114°07′30″

Field work conducted 2012.

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PDF (Acrobat Reader) map may be viewed online at