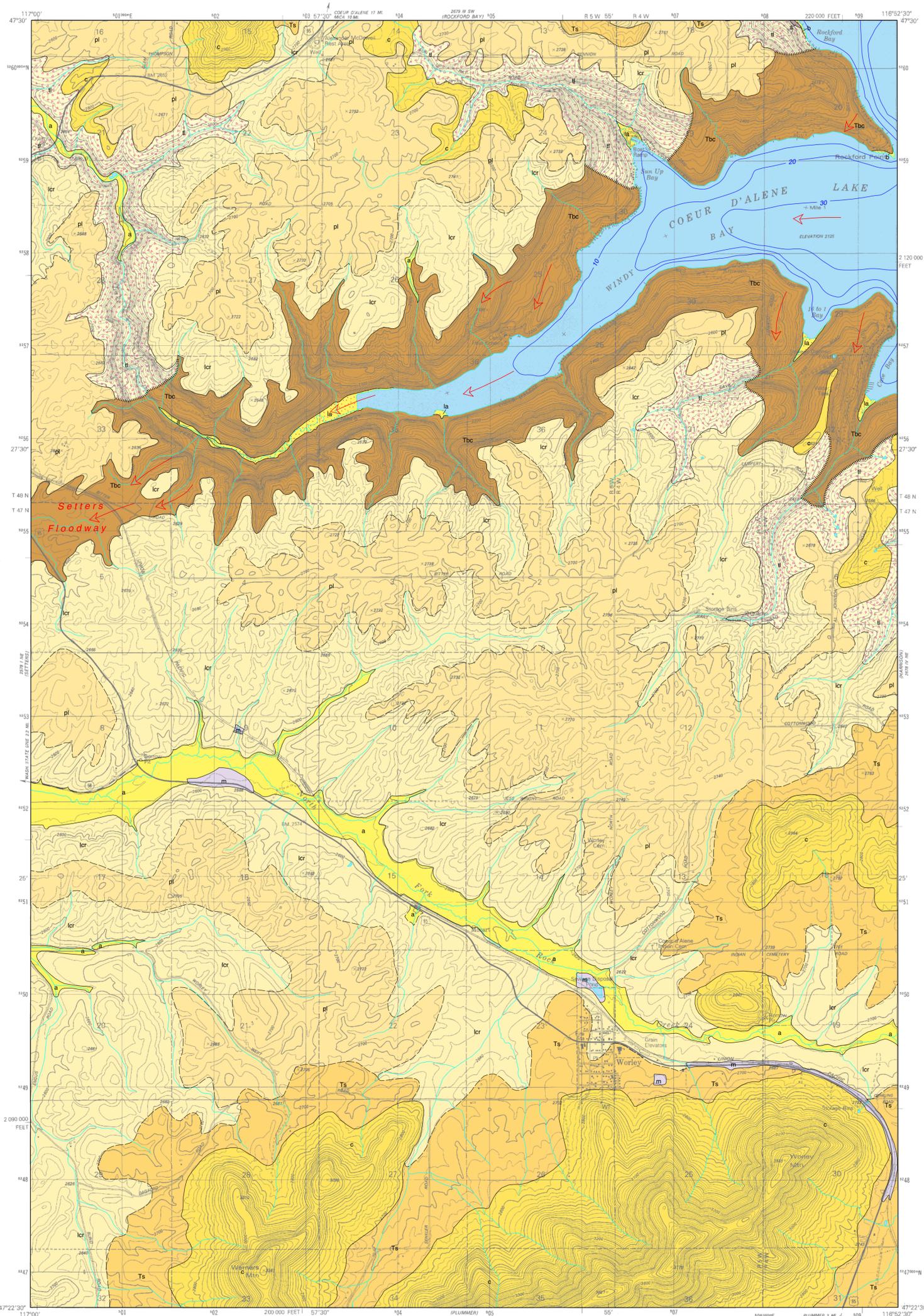


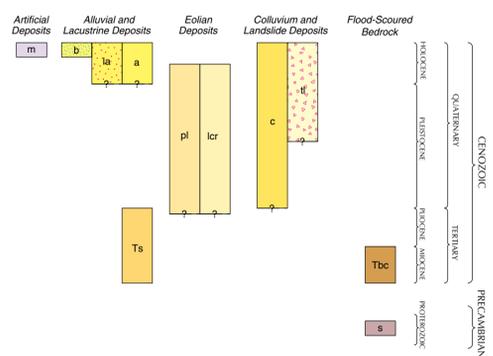
# SURFICIAL GEOLOGIC MAP OF THE WORLEY QUADRANGLE, KOOTENAI COUNTY, IDAHO

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**Disclaimer: This Digital Web Map is an informal report and may be revised and formally published at a later time. Its content and format may not conform to agency standards.**



## CORRELATION OF MAP UNITS



## INTRODUCTION

This map product addresses the increasing demand for geologic information in urban areas. The area covered by the map is experiencing some of the most rapid growth in Idaho. The geologic mapping was funded in part by STATEMAP, a national cooperative program of the U.S. Geological Survey with the state geological surveys.

The Worley Quadrangle is located on the west side of Coeur d'Alene Lake at the edge of the Columbia Plateau and the Coeur d'Alene Mountains. Lake Coeur d'Alene is dammed by glacial flood gravels at the northern end near the City of Coeur d'Alene and provides substantial subsurface recharge to the Rathdrum aquifer. Catastrophic outbursts of ice-age floods from Glacial Lake Missoula inundated the present Coeur d'Alene Lake basin to at least 2600 feet in elevation creating floodways between some of the tributary bays. The Setters floodway crosses the Worley Quadrangle and was scoured by water flowing from Windy Bay across the watershed divide and into Rock Creek. The lake is fed by the St Joe and Coeur d'Alene river systems and the outlet is the source of the Spokane River. The plateau west of the lake are underlain by Miocene lavas of the Columbia River Basalt Group. Gneissic rocks of the Precambrian Belt Supergroup and associated intrusive granitic rocks of Cretaceous age form buttes that rise above the plateau lavas and control the flow of basalt into embayments. The eastern margin of the Columbia Plateau is covered by Miocene sediments and soils that is in turn blanketed by Palouse loess that are progressively thicker toward the west.

The map represents the geology of the materials and soils exposed near the earth's surface. The thickness of these deposits varies from a few feet to tens of feet. The map is useful for determining the type and characteristics of the geologic materials found at the surface and in the shallow subsurface by agricultural activities, building excavations, construction material excavations, ditches, and well holes. The information can be used by government, industry, and the public for planning, development, and resource characterization. The map can be used as a guide for site locations but is not intended as a substitute for a detailed, site-specific geotechnical evaluation. This is particularly true in the lake shore areas where access is limited and human activity has concealed the geology.

Most users of geologic maps are familiar with traditional lithologic descriptions of bedrock units. Surficial maps show units with more diverse characteristics than rock type or lithology. Most surficial deposits are geologically young, Quaternary in age, and unconsolidated. The Quaternary units are subdivided on the basis of their physical characteristics and the boundaries between them (allostratigraphy). In many places, the boundaries between these units are manifested by morphologic features.

## DESCRIPTION OF MAP UNITS

### ARTIFICIAL DEPOSITS

**m** **Made ground (historical)**—Manmade deposits include disturbed, transported, and emplaced construction materials derived from various local sources. Includes the Coeur d'Alene Tribal Casino complex, Worley sewage plant, and the right-of-way of US 95 where earthmoving has changed the landscape morphology. Many smaller disturbed areas in Worley and along the shore of Lake Coeur d'Alene are too small to map.

### ALLUVIAL AND LACUSTRINE DEPOSITS

- a** **Alluvium (Holocene)**—Primarily stream and slope wash deposits. Silt interbedded with silty sand, granules, and pebbles. Silt is mostly reworked from Palouse Formation (pl). Locally, pebble and cobble gravel of reworked Tertiary gravel (Ts) or basalt (Tbc) is exposed in channels.
- b** **Beach deposits (historical-Holocene)**—Natural and manmade deposits include disturbed, transported, and emplaced construction materials derived from various local sources. Many smaller areas of made ground have not been mapped and include berms and fills along the waterfronts and beachfront of Coeur d'Alene Lake.
- la** **Lacustrine sediments and alluvium (Holocene)**—Silt and sand deposits in bays of Coeur d'Alene Lake. The deposits are mainly located within the lake's high-water zones and are interbedded with and grade upstream into alluvium of tributary streams. Soils are deep, poorly drained, and include muck of the Pywell series and silt loams of the Cald series (Weisel, 1981).
- Ts** **Lag gravels on relict alluvial surfaces (Tertiary)**—Cobble and pebble gravels consist of mature rounded quartzites and mixed lithologies derived from the Precambrian Belt Supergroup rocks and Mesozoic-Tertiary intrusives. Matrix of weathered caprolite. Exposed on flat upland surfaces. The unit forms a flat to gently sloping upland surface 2,400-2,600 feet in elevation that is underlain by basalt of the Priest Rapids Member (Wanapum Basalt). The unit grades laterally into thick colluvium or residuum of pre-Tertiary rocks. The alluvial deposits are probably graded to high base levels formed when the Miocene plateau basalts blocked and diverted stream drainages (Othberg and Breckenridge, 1998). Mostly mantled with loess. Soils are silt loams of the Taney and Setters series with some clay exposed in shallow soils.

### EOLIAN DEPOSITS

- pl** **Palouse Formation loess (Pleistocene and Holocene)**—Silty and clayey loess remnants that are distal outliers of the Palouse hills of the eastern Columbia River Plateau. The Palouse Formation overlies a Miocene-Pliocene surface primarily developed on the basalt of the Priest Rapids Member (Wanapum Basalt) and Tertiary alluvial deposits (Tg). Soils include the Santa and the Taney series (Weisel, 1981).
- lcr** **Loess, colluvium, and residuum (Holocene and late Pleistocene)**—Silty loess and clay remnants formed on moderately dissected Miocene basalt surface. Soils developed in the thin loess include the Larkin, Setters, Southwick, and Taney series (Weisel, 1981). Subsurface is rich in clay and grades with depth into basalt. Along drainages, basalt may be within a few feet of the surface. Typically borders and grades laterally into areas of thick Palouse loess (pl), but may grade into areas of Tertiary sediment aprons adjacent to hills of pre-Tertiary bedrock (Ts).

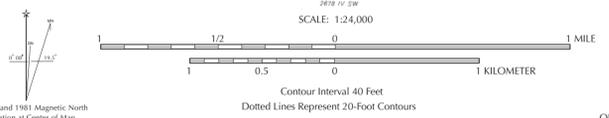
### COLLUVIUM AND LANDSLIDE DEPOSITS

- tl** **Talus and landslide deposits of Columbia River Basalt Group (Holocene and late Pleistocene)**—Poorly sorted and poorly stratified angular basalt cobbles and boulders mixed with silts and clays. Mass-movement slope deposits mainly associated with steep basalt rimrock and the interbedded sediments. Locally may include basalt columns either from mass movement processes or deposited by Lake Missoula floods. Gradations from talus to smaller landslide deposits are present and difficult to distinguish. Thickness as much as 40 feet.
- c** **Colluvium and common small rock outcrops (Quaternary)**—Colluvium is composed of angular pebble and cobble gravel in a sandy silt matrix that overlies relatively unweathered Precambrian gneiss and arkosic quartzite. Where slopes are steeper, the unit may include landslide and debris flow deposits. Thickness of colluvium less than 6 feet. Soils of the Tekoa and McCroskey series and thin colluvium over bedrock. On bedrock dominated outliers the thin and discontinuous colluvium is composed of angular pebble and cobble gravel in a sandy silt matrix. Bedrock outcrops are typically Precambrian quartzite. Ridges parallel the strike of the regional foliation. Thickness of colluvium less than 6 feet.

### FLOOD-SCOURED BEDROCK

- Tbc** **Basalt scoured by Missoula Floods (Miocene)**—Columbia River Basalt Group. Forms sporadic rimrock around Coeur d'Alene Lake and tributary valleys. The Priest Rapids Member (Wanapum Basalt) and Grande Ronde Basalt are recognized in the area. The contact of the N2 and underlying R2 flows of the Grande Ronde is near the elevation of the lake surface. Shallow surface soils are stony clay loam of the Lacey-Bobbitt association (Weisel, 1981). Locally scattered flood erratics are common. Surface deposits are 2 to 15 feet thick.
- s** **Precambrian metamorphic rocks of the Belt Supergroup scoured by Missoula Floods (Precambrian)**—Mapped as the Burke and Pritchard Formations by Griggs (1973).

Base map from USGS digital raster graphic. Scanned map dated 1981.  
Control by USGS and NOS & NOAA.  
Topography by photogrammetric methods from aerial photographs taken 1975. Field checked 1976. Map edited 1981.  
1927 North American Datum. Projection and 10,000-foot grid ticks based on Idaho coordinate system, west zone Transverse Mercator.  
1000-meter Universal Transverse Mercator grid ticks, zone 11.



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## SYMBOLS

- Contact dashed where approximately located.
- ▬▬▬▬ Gradational contact.
- ↖ Abandoned channels of Lake Missoula Floods drainages; Setters floodway crossed over the drainage divide into Rock Creek drainage. The floodway contains some ice-rattled erratics.
- 40 Bathymetric contours in meters (Woods and Berenbrock, 1994).