BUILDING STONE QUARRIES AND YARDS, UTAH AND PARTS OF ARIZONA, IDAHO, MONTANA, WASHINGTON, AND WYOMING

by
David E. Boleneus

OPEN-FILE REPORT 521
UTAH GEOLOGICAL SURVEY
a division of
Utah Department of Natural Resources
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Spokane, Washington

Cover: Delta Stone Products Inc. showing Mountain Valley Quarry blonde, tan, red, and natural stone. Inset photo shows slab material.

Prepared in cooperation with U.S.D.A-Forest Service, Northwest, Intermountain, and Northern Regions, U.S. Department of Interior, Bureau of Land Management, Salt Lake City, Utah, and Utah Geological Survey, 1594 West North Temple, Salt Lake City, Utah.

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SUMMARY

This three-part report presents comprehensive information about the building stone industry in Utah and the nearby states of Idaho, Wyoming, Montana, and Washington. Chapter 1 presents an inventory of stone operations and stone yards used for operational or retail purposes. Chapter 2 is an analysis of quarrying and processing methods and deposit characteristics of the stone. Chapter 3 presents an analysis of employment, distribution, and a market survey of Utah stone retail distributors, in addition to addressing demand factors of operating cost, wholesale price, retail price, and production rate. Each chapter is a standalone document with separate table of contents, figure and table numbers, references, and appendices. The report is unusual in its treatment of the subject as it addresses geological data, quarry operations, and the wholesale and distributor levels of the stone industry in Utah. However, this industry is so large that a full analysis is not possible within these time and space constraints of this report. Others addressing the subject (Tripp, 1993; 1994), Montana (Berg, 1974), and Wyoming (Harris, 1991; 2003) have limited their scope by location and geological information of quarry operations or to the production data volunteered to the U.S. Geological Survey (Kelly and Matos, 2005).

The nature of the landscape and building stone industry in Utah and nearby states was examined during 2004-2005. Investigation of 242 stone quarries and stone yards serve as a database and the geographic extent of the study. Visiting quarries and compiling information from operators occupied the 2004 field season while the 2005 period was devoted to conducting interviews, collecting additional data from state agencies, analyzing the data, preparing maps and tabulating data. Quarries were examined over a broad geographic area in order to obtain the necessary perspective for comparisons. Also, sites found on private lands, lands administered by state and federal agencies were included to examine operating or management differences. The wide area of investigation also enabled examination of the variability in methods of extraction in addition to geologic formations and lithologic units that host the resources of stone.

Stone, as addressed here is building, decorative, and landscape stone that mainly includes the blocks, slabs, or pieces of rough stone, rubble, ashlar, and panels. Its use includes landscape, building, and ornamental applications. Little of the stone is sawed or slabbed, cut, polished or ground which is referred to as true dimension stone. Stone addressed here is not crushed construction stone or stone used for sand or gravel for road or building construction; however it does include aggregate produced for landscape or ornamental purpose. Domestic production and consumption (Kelly and Matos, 2005) of crushed stone in 2004 both equaled 1.5 billion metric tons (1.68 billion short tons) with a value of $5.71 per metric ton ($5.18 per short ton). Production of landscape and building stone in Utah increased 690 percent from the level in 1995 to a high of 102,202 short tons in 2001. Production then declined to 91,489 short tons in 2004.

The rapidly growing demand for these materials has exerted pressure on lands managed by federal agencies to dispose of or manage these materials by sale, common use, community pits, or to determine the validity of mining claims. An inventory of these operations partly satisfies the need to understand the building stone industry and to subsequently manage the stone resources on public lands. The inventory and analysis is also valuable for the building stone industry and quarry operators and retail distributors that require this data in their business.

The first chapter presents a preliminary Inventory of Selected Sites of stone operations by examining the building, landscape, and ornamental stone quarries in Utah and selected sites in adjacent states of Arizona, Idaho, Montana, Washington, and Wyoming (fig. 1). The first chapter also provides an introduction to matter presented in chapters 2 and 3. The inventory data were compiled into a spreadsheet that consists of 78 columns of data for 242 sites. Inventory categories of the spreadsheet consist of: name and identifying data, location information, operator data, rock type and characteristics, mine operations, personnel, mine equipment and product data, sales and market data, and production. The spreadsheet contains data for 216 quarries and 26 yards. Of this number, 170 quarries and 10 yards are located in Utah and 46 quarries and 16 yards are in other states. Other archive materials consist of 3,900 photographic images and 141 rock samples.

A second chapter analyzes the Deposit Characteristics and Quarrying Practices observed at inventoried sites, including the production of stone at these sites. Information includes operating status, stone production, types of operations, geology and availability of materials, quarrying practices, and processing. Quarries produce rough and trimmed stone used for building, ornamental, and landscape purposes. Sixty-two percent of the sites are active, with the remainder categorized as proposed, explored, past producers, or inactive. During the 1994-2004 period, the top producing county in Utah was Summit County (54,955 tons), followed by Box Elder (38,856 tons), Beaver (22,985 tons), and Iron (19,350 tons) counties. Custer County was the top producer in Idaho (36,784 tons) followed by Cassia (18,100 tons) County, according to the information compiled. The top producing quarry in 2004 in the study was Three Rivers (Custer County, Idaho), followed by Bright (Iron County, Utah), Browns Canyon #1 (Summit County, Utah), Scrivanich Natural Stone (Cassia County, Idaho), and Bead Lake (Pend Oreille County, Wash.). Five quarries that produced more than 5000 tons in 2004 account for 58.8 percent of total production and 23 quarries that produced greater than 2000 tons account for 90.2 percent of total production. The most common rock types found in Utah quarries, in decreasing order, are quartzite, sandstone, limestone, marble, and rhyolite; quartzite is mostly found in the district comprising Box Elder Co., Utah and Cassia Co. Idaho; sandstone mainly occurs in eastern Utah and southwest Wyoming. The most common geologic units found in Utah quarries, in decreasing order, are Cambrian Quartzite of Clarks Basin, Precambrian Elba Quartzite, Tertiary Green River Formation, Triassic Moenkopi Formation, Ordovician Marjum Formation , and Jurassic Nugget (or Navajo) Formation.

Ownership of quarries by mining claims represent the most common land tenure method (35 percent) followed by ownership of or lease of private land (19 percent), disposal by material site (12 percent); lease of state-owned lands (13 percent); tenure in the remaining cases is by common use site, community pit, or unknown (20 percent).

The geographic extent of the distinctive pale green coloration in the Upper Proterozoic (or Precambrian Z) Elba Quartzite

and other formations is examined in more detail as these are important sources of flagstone resources. The strata containing the unique pale green coloration forms a separate member in the Elba that is geographically-restricted to the Raft River Mountains. The coloration, due to a chromium mica mineral, is found in several other formations and locations in the region. The geographic extent and quarries in the Triassic Moenkopi Formation are examined in detail because of its wide importance as a source of attractive reddish-brown quarried stone in southern Utah.

Methods of mining are by hand methods or a combination of hand with some degree of mechanized equipment. Mining takes place entirely by hand in 11 percent of quarry production, and some form of hand processing, such as splitting, sorting, and stacking on pallets, is employed in 90 percent of stone production. Methods of processing include the use of (1) gang, wire, radial slab, and band saws to cut exact sized blocks, tiles or flagstone, (2) hydraulic splitters to create brick-like blocks, (3) tumblers to round edges of paver blocks, and finish work completed by either (4) polisher tables or (5) hand work, or both.

A third chapter analyzes Market Data. It summarizes data on employment and productivity, transportation, product demand, and origin and destinations of stone materials. Product demand includes an analysis of wholesale price, retail price, and operating cost in relation to production. The analysis relies on data collected in 2004-2005 consisting of the quarry inventory, marketing interviews with retail distributors, other geologists, data taken from retail flyers, and other marketing reports, and U.S. Department of Labor. Sources of market data extend across the U.S.

Utah quarries employed 203 persons statewide during 2004. Employees worked an average of 34.6 weeks (1087 hours, on average), or 281,605 total employee hours, an increase of 52 percent from 2002. Montana quarries employed 254 persons, Idaho employed 224 persons, and Washington employed 63 persons on a statewide basis. In Utah, the average productivity rate is 3.1 employee hours to produce one ton of rock. The highest productivity rate was at the Three Rivers quarry, in Custer County, Idaho, with 1.8 employee hours to produce one ton of rock.

Examination of Utah Department of Transportation port-of-entry records shows that most origin points and destination points of rock are found in Utah, with the highest frequency in Salt Lake County. The next most frequent points of destination or origin of shipments are located in Box Elder or Uintah Counties in Utah and Cassia County, Idaho.

Interviews with 121 retail distributors concerning stone from three Utah quarries gave important insights about purchasing practices, quantities of stone purchased, and customer preferences. Although the interview results provide a snapshot equivalent to only 31 percent of Utah's stone export business, it showed that 76 percent of these sales were to distributors situated within the range of 400 and 1000 miles from the quarries. Export destinations of stone include, in decreasing order: California (52 percent), Oregon, Montana, Washington, Colorado, Nevada, Idaho, and Arizona. Flagstone was, however, shipped a distance of up to 2900 miles, as far as Maine, Florida, Hawaii, and Guam. The average distributor surveyed purchased 197 tons during 2004 and 69 percent of purchases ranged from 12 to 240 tons, although the three largest distributors located in California purchased 2360 to 3300 tons. Flagstone represents 90 percent of distributor stone purchases, with ledgestone, boulders, and aggregate representing the remainder.

For this distributors studied, the 2004 average cost of shipping stone by a tractor trailer rig of 24 tons was $0.059 per ton per mile. This transport cost averages $47.88 per ton for an average distance of 749 miles.

Wholesale prices show a linear relationship with retail prices of stone; the wholesale prices range $40 to 50 per ton for aggregate or crushed stone, $50 to $175 per ton for boulders and ledgestone, and $175 to $325 per ton for flagstone. On average, there is a 1-to-1.02 wholesale-to-retail price relationship after addition of $179.72 per ton to the quarry wholesale price to determine the distributor's retail price. Retail prices range $300 to $600 per ton for flagstone. For these materials, the operating cost averages 44.8 percent of the wholesale price.

A method is suggested by which five types of stone products—dimension stone, hand-split flagstone, surface-collected stone, crushed stone, and specialty boulders—can be segregated by their unique grouping with respect to operating cost, wholesale price, and production rate. When comparing either production rate versus cost (price) or production rate versus price, dimension stone falls at the highest cost level due to its high unit production cost, crushed landscape stone (aggregate) falls at the lowest cost level due to its low unit production cost, surface collected stone falls at lowest levels of both cost and production rate due to its sparse availability and ease of collection, and hand-split flagstone falls at the intermediate region since its cost (price) is labor-intensive and its production rate is labor-dependent. This examination leads to the conclusion that the stone products maintain consistent demand relationships applicable to future marketability and appraisal investigations.

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CHAPTER 1
INVENTORY OF SELECTED SITES

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ABSTRACT

This inventory of selected stone quarry operations conducted in 2004 is the first of three chapters that examine the building (also decorative, landscape or ornamental) stone industry in Utah and in other western states. The inventory documents a selection of 216 stone quarry sites and 26 stone yards. Of this total, on-site examinations were conducted at 168 stone quarries and 26 stone yards, while data from the remaining 48 sites were compiled from unpublished sources. Most of the quarry sites are located in Utah (170), followed by Idaho (21), Washington (10), Montana (10), Wyoming (3), and Arizona (1). The stone yards are used for a variety of purposes, including operations, maintenance, as a shipping point for wholesale product, and as retail sales outlets for stone. Nineteen of the yards are located in Utah and Idaho. The data facilitates the analysis of stone in this region by size of quarry, operating status, land ownership (federal, state, private) and geography.

A database summarizing the data is compiled on three plates and in a database file (App2_stone_sites.txt). The three plates identify each quarry and yard location. In addition quarries are also identified by producing rate and ownership. Details about each quarry or yard are also compiled in the database file. Information collected here contains: name and identifying data, location information, operator, rock type and characteristics, mine operations, personnel, mine equipment, production, product data, and sales and market data.

Later chapters analyze the data compiled in chapter 1. These include data on geography, surface management, lithology, geologic, quarry production, method of quarry operations and processing of the stone, and an analysis of market and cost data.

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Numerous Bureau of Land Management (BLM) and U.S. Department of Agriculture-Forest Service (USDA-FS or FS) personnel provided assistance during the course of this investigation. Completion of this project would not have been possible without the several days devoted by those named. Local experts from the BLM and FS served as guides during examination of sites and provided personal insights about geology, mining activity, land management challenges, mining operations, local stone market conditions, and retail outlets. James Kohler, Chief, and Doug Bauer, Senior Technical Specialist, Branch of Solid Minerals, Utah State Office suggested that documentation of quarry operations would assist in management of federal lands and provided initial assistance at the outset. Included among those assisting the author from BLM Utah Field Offices are Mike Ford and Larry Garahana, Salt Lake Field Office; Michael Jackson and Francis Rakow, Richfield Field Office; Jerry Mansfield, Fillmore Field Office; Ed Ginouves, Cedar City Field Office; Rick Rymerson, St. George Field Office; Doug Powell, Kanab Field Office; Ted McDougall, Monticello Field Office; Dean Nyffler, Price Field Office; Brent Northrup, Moab Field Office; and Pete Sokolosky, Vernal Field Office. Those from other states are Loren Wickstrom, Durango Field Office in Colorado; Mike Sweeney and Gary Yeager, Spokane Field Office in Washington; Forest Griggs, Burley Field Office, Ken Gardner, Challis Field Office, Bill Stout, Pocatello Field Office, and Chuck Horsburgh, Idaho Falls Field Office, in Idaho; and Gary McNaughton, Kemmerer Field Office in Wyoming. Graphics design and geographic information systems support was provided by Gary Gale, Lynn Roth, John Hatch, and Gregg Ostergaard of the BLM Utah State office.

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INTRODUCTION

This chapter documents an investigation of building stone quarries and yards examined in 2004 in Utah and selected quarry sites and stone yards in parts of Arizona, Wyoming, Idaho, Montana, and Washington (figure 1). In this report, building stone includes stone used for decorative, ornamental, and landscape purposes but does not include crushed, construction, or calcined stone used for construction of buildings and highways. Since stone is multipurpose, no classification can completely eliminate the overlap between dimension stone, ornamental stone, decorative stone, aggregate, and building stone (Austin and others, 2006). Building stone refers to stone of these varieties and purposes, and is the preferred terminology used in this report for two reasons: (1) Building stone can refer to both undressed and dressed stone, such as that in natural or broken sizes used for paving, rough construction, decoration, and landscaping; and (2) building stone has a certain legal connotation in U.S. mining law for rock or stone used for these purposes. The basic types of stone addressed in this report are unprocessed rough stone (flagstone or fieldstone, patio rock, stack stone, ledge stone, rubble, paving blocks, rough construction, and jetty stone), aggregate or crushed stone that is slightly processed for these purposes (river rock, scoria, fused argillaceous rock, terrazzo), and dressed stone that is moderately processed (ashlar, fireplace rock, tile, veneer). Dimension stone, however, is that stone that is finished to specific dimensions or sizes, such as rectangular blocks and sawed slabs for buildings, monuments, and furniture (Mead and Austin, 2006). Its dimensions have stricter specifications than stone used for other building purposes. Few examples of stone considered dimension stone by this definition are addressed in this report

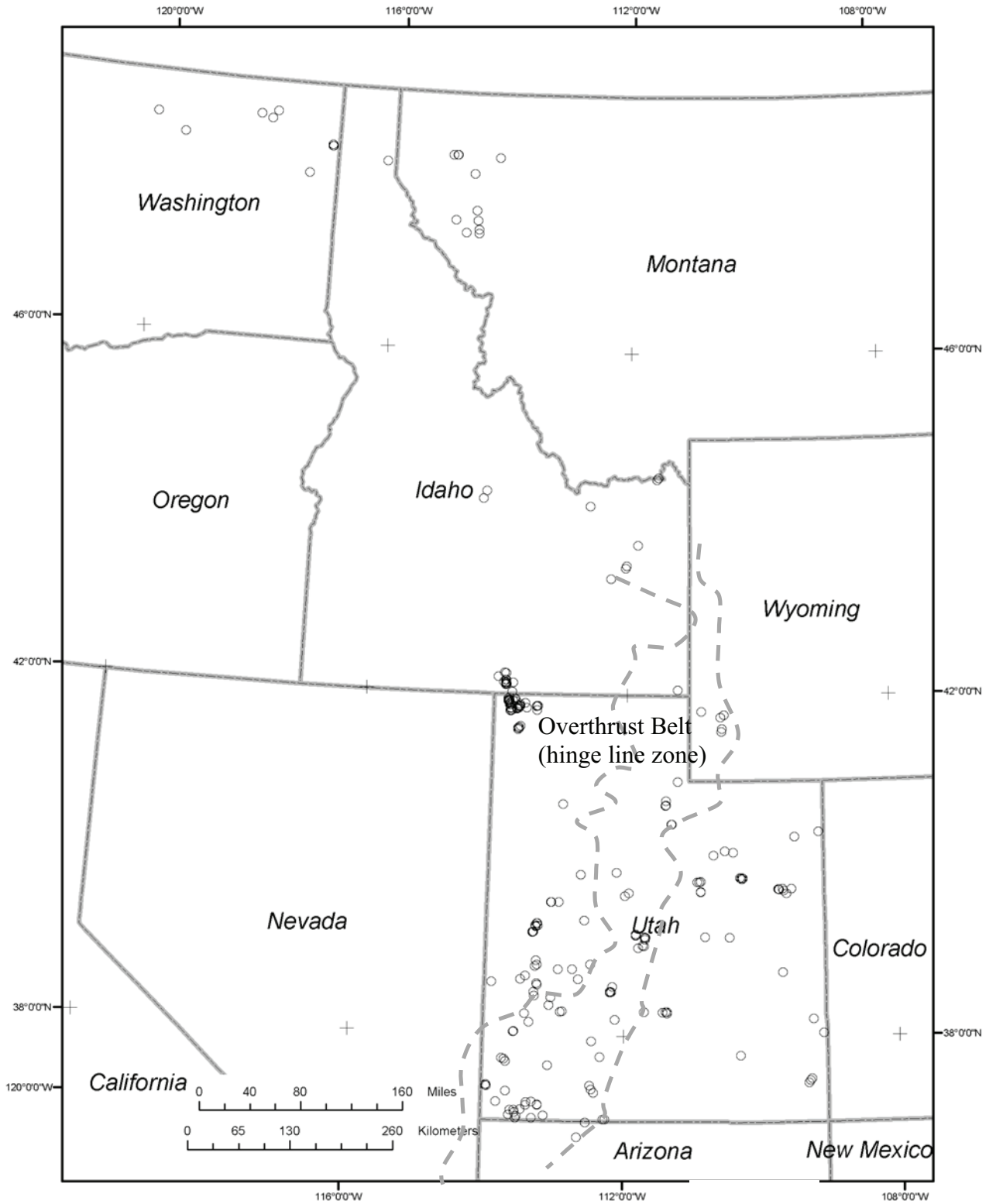

Figure 1. *Map showing location of sites inventoried.*

although some dimension stone quarries are located within Utah. With these few exceptions this chapter does not include an examination of dimension stone, as defined.

An inventory of rock operations presented in this chapter is required to understand the building stone industry for management of the stone resources on federal lands. The data in this report are also valuable for the building stone industry, quarry operators, or consumers. This chapter also serves as an introduction to matter presented in the two following chapters of this report. The convention used here is that reference to material within a "chapter" shall refer to material in the current chapter while "report" refers to material within the entire report consisting of chapters 1, 2, and 3.

Because of its endowment of natural stone, Utah's federal lands have recently come under increased pressure from stone operators due to this rapidly growing demand for crushed, block, patio, ashlar, and veneer building stones. These rock materials are used for other purposes as well such as building facing, walks, walls, and landscape purposes. This growing demand has exerted pressure on lands managed by the BLM, an agency of the U.S. Department of Interior and the FS to sell these materials by non-exclusive or exclusive sales from material, common use, and community pit sites, or by allowing the location of mining claims for this material.

Quarrying in Utah is the focus of this investigation so necessarily more inventoried sites are located in Utah than in other states. Therefore the state-by-state coverage of sites in this report is unequal. Sites investigated range widely in their degree of development from outcrops at sites of proposed operations, to raw or explored prospects, to developed projects, to active or inactive mines, and to yards used for operations or sales of stone.

During the field examination, a wide variety of sites were examined to gain a broad view of the industry, type of stone removed, operating practices, and the market for stone. Consideration was also given to differences in: (1) geographic distribution, (2) varieties of stone due to geology, rock type, or quality, (3) ownership, and (4) method of management of stone by federal and state governments. Due to time constraints, this report does not report on all sites located in each of these states. To address possible differences due to geography, quarry sites were visited and market data were obtained in nearby areas of southern Idaho, southwestern Wyoming, western Montana, and northeastern Washington. Sites visited represent a variety of rock types from a variety of geologic formations. Quarry sites were included from private and state lands. In addition to visiting sites of locatable minerals on federal lands, quarries containing salable minerals were also examined. Management of salable stone on federal lands includes common use, community pits, and material sales. Records of the Utah Department of Natural Resources Division of Oil, Gas, and Mining (DOGM) and the Utah State Institutional and Trust Lands Administration (SITLA) provided information about stone quarries since these agencies oversee mining within Utah.

Inventory of Selected Sites is arranged as follows. First, the Geologic and Physiographic Setting of building stone within the area of investigation is addressed. Building Stone Database describes the nature and method of the field examination and the layouts of the Excel spreadsheet and the Oversize Maps (plates). The Excel spreadsheet, stone_sites.txt (appendix 2) contains information about each of the 242 sites, whether yards or quarries. The oversize maps locate and classify the sites on a map. They provide detailed information on 168 sites examined by the author, including data obtained from the BLM and from records of conversations with owners, operators, or employees. Data for the remaining 46 sites are compiled from an investigation of stone completed in 2004 by SubTerra Inc. or from agencies of the State of Utah.

The final section on Building Stone Quarries and Yards provides an overview of the quarry sites, organized within boundaries of federal land management jurisdiction, although the quarries or yards may lie on private or state lands within these boundaries. Comparisons are made across the areas of study between operation size, management method, and production rates for stone.

Current Data and Previous Work

Other than its reporting of construction stone, sand and gravel or aggregate, U.S. Geological Survey's (USGS) Minerals Information Program only reports the production of rock called dimension stone, so one must assume that production of building stone addressed in this chapter is included within the USGS' dimension stone classification. USGS reports that domestic consumption of dimension stone was 7.5 million short tons (6.85 million metric tons) with domestic production amounting to 18 percent of this amount (Kelly and Matos, 2005). USGS' dimension stone is valued at $183 per short ton ($202 per metric ton), and because of its high value, dimension stone is transported worldwide.

Data in this report differ in two important ways from those reported by USGS (Kelley and others, 2001): in coverage of the topic, and in level of detail of data. As the term is used in this chapter, stone used for landscape and building purposes overlaps the crushed stone and dimension stone categories of USGS. Therefore the information presented here and that reported by USGS are unequal and the differences cannot be resolved and the reasons are most likely due to the highly competitive nature and rapid growth of the industry. For example, in Idaho and Utah, the USGS obtained data volunteered from only two of approximately 190 operators known, Northern Stone and American Stone (Kelly and Matos, 2005). These two operators own or operate 16 of the 216 stone operations presented in this report. Furthermore, USGS lists no operators for Montana, Washington, and Wyoming where 20 mines are compiled in this report with 12 of these mines operating in 2004.

Reporting of quarrying operations by Mine Safety and Health Administration (MSHA) compared to this report is also unequal because of reliance on volunteered information. The unequal reporting is more pronounced in Utah where MSHA (2005) lists 19 active operations compared to the 96 active quarries and 12 active surface collection sites compiled in this report.

StoneReport (2005) reports the consumption of dimension stone in the United States increased more than 300 percent during the period from 1993 through 2003 reaching 70 million square meters . For comparison, production of building stone in Utah increased more than 960 percent during the period from 1995 to 2001 according to information collected in this study.

Various reports by the Utah Geological Survey and other sources document Utah's building stone resources. Tripp (1993) assembled a brochure with photographs of many varieties of Utah stone. Doelling (1980) and Tripp (1994) address stone resources in Box Elder County, and Stokes (1986) reviews building stone resources in his book Geology of Utah. Bon and Wakefield (1999) list Utah's DOGM small mine permits for stone. SubTerra (2004) evaluated Utah's building, decorative, and landscape stone industry and contains an unpublished database of rock quarries and rock yards used in this chapter to augment the field inventory. Similar reports have provided a compendium of stone quarrying and stone resources in states of Montana (Berg, 1974) and Wyoming (Harris, 1991; 2003).

Federal Minerals Management

Rock is disposed of by BLM and FS as either a salable or locatable mineral. All minerals were called "locatable" minerals following enactment of the Mining Law of 1872 because the mining claim boundaries of placer or lode claims must be located by placing monuments at corners of each claim. Enactment of the Materials Act of July 31, 1947 and the Surface Resources Act of July 23, 1955 prohibited the location of mining claims upon certain common minerals and materials such as common clay, common stone, construction materials, sand, gravel, pumice, pumicite, and cinders. The Materials and Surface Resources Acts directed that such minerals be managed only by exclusive or non-exclusive sales. Therefore, minerals in this category have become known as "salable" minerals . Court decisions concerning the mining law have permitted a small fraction of the materials named in the Acts of 1947 and 1955 to be locatable under very specific circumstances in a category known as "uncommon variety" of minerals. Mining law decisions since 1947 continue to narrow the definitions of uncommon and common varieties of minerals, a topic beyond the scope of this report.

Complex management regulations of stone materials on FS and BLM lands require a thorough understanding of these resources and the stone industry. Forest Service regulations have less flexibility compared with BLM on stone, and direct that rock used for landscape purposes must be disposed of by sale, absent a determination of the stone as a locatable mineral. The increased development and differing BLM regulations on federal lands has raised the question: Should rock used for building or landscape purposes be disposed as a salable or locatable commodity? To help answer this question, this inventory was conducted to contribute information needed for future management of these resources.

The overthrust belt of Utah (between gray dash lines) also extends through parts of Arizona, Nevada, Idaho, Montana, and Wyoming.

GEOLOGIC AND PHYSIOGRAPHIC SETTING

Utah is roughly divided into east and west halves by the generally north-to-south trending overthrust belt. The overthrust belt (also known as the hinge line) is generally defined by the traces of several separate thrust faulted zones on the west and other thrust faults and normal faults on the east (figure 1, gray dash line). The overthrust belt is a 60- to 120-mile-wide zone of transition province trending south from Bear Lake northeast of Logan, continuing past Provo, Manti, Richfield, Beaver, and exiting into Nevada along a southwest trending line west of St. George. West of the Wah Wah, Mineral Range and Canyon thrust faults, which mark the west boundary of the overthrust belt, lies the Basin and Range province that contains older platform stratigraphic sequences of Archean, Proterozoic, and Paleozoic ages interspersed with superficial cover of volcanic rocks of Tertiary age. The Colorado Plateau province lies east of the overthrust belt where this boundary is generally delimited by a series of extensional faults where the rocks consist of less deformed rock sequences of mainly Mesozoic and Cenozoic ages. The overthrust belt continues north into Idaho, Wyoming, Montana and Canada and south into Nevada, Arizona, and Mexico although it is not shown in figure 1.

The following geological discussion is limited to the description of geologic units (Stokes, 1986) found at quarries yielding building stone in Utah and nearby states. Quarries are listed by geologic unit and its age in table 1. Plates 1 through 3 that accompany this report show the locations of quarries and yards in the study area, and are explained in greater detail later in this chapter.

Precambrian rocks are the most important source of building stone products since rocks of this age are present in at least 43 quarries in the study area. Gneiss, the oldest rock examined during this study, is found on a ridge and adjacent area named Cotton Thomas, a part of the northern Grouse Creek Mountains (also known as the Vipont Mountains) of Box Elder County within the Basin and Range Province (plate 2). This adamellite gneiss (Hintze, 1988, p. 130-131), which may be as old as 2.5 billion years, is perhaps correlative to the gneissic granite of the injection complex of undetermined Precambrian age found on the Middle Mountain segment of the Albion Range, Cassia County, Idaho (Armstrong and others, 1978). Middle Mountain is a northerly extension of the Cotton Thomas located about 10 miles south of Oakley, Idaho. The gneissic rocks of Middle Mountain are excavated at the Granite quarry owned by the Northern Stone Supply's Oakley, Idaho operation, and at least two other quarries along the Cotton Thomas operated by American Stone. A series of younger, transitional Proterozoic and Cambrian rocks, less than 1.7 billion years in age belonging to the Raft River Mountains Sequence, rest unconformably on the older Archean gneiss (Hintze, 1988, p. 130). Units in this younger sequence in the Albion Range area in Idaho, and the Raft River and Grouse Creek Mountains in Utah may total 3500 ft thick and include, in ascending order, the Elba Quartzite, Schist of Upper Narrows, Quartzite of Yost, and the Schist of Stevens Spring. The uppermost part of this sequence is capped by rocks of Cambrian age, the Quartzite of Clarks Basin and Schist of Mahogany Peaks. The Elba Quartzite is distinctive, quite pure, and it often contains a chromium mica mineral, fuchsite, that imparts a lime green color to the rock quarried in the Raft River Range. The Elba Quartzite is correlative with the Proterozoic Facer Formation of the Northern Wasatch Range in the hinge line zone. One quarry is also found in the Inkom Formation which is equivalent to the Precambrian Schist of Stevens Spring. The Inkom Formation is found near and west of the hingeline zone but is extensive over a broad area from Pocatello, Idaho

Table 1. *Number of quarries identified by geologic unit.*

Age	Geologic Unit (states)	Number
Recent	Basalt (UT, ID)	2
	Tuff of Goose Creek (ID)	2
	Steamboat Rhyolite (UT)	1
	Joe Lott Tuff (UT)	1
	Bullion Canyon (UT)	3
Oligocene-Miocene	Bear Valley Fm.	1
Eocene-Paleocene	Colton Fm. (UT)	3
	Green River Fm. (UT)	20
Cretaceous	Frontier Fm. (WY)	2
	Dakota Ss../Fm. (UT)	5
Jurassic	Navajo/Nugget Ss. (UT, WY)	11
Triassic	Chinle and Moenkopi Fms. (UT, AZ)	13
Pennsylvanian-Jurassic	Kettle-Okanogan Gneiss (WA)	6
	Humbug Fm. (UT)	1
	Buck Mountain Fm. (WA)	1
	Oquirrh Fm. (UT)	1
Mississippian	Callville Ls. (UT)	3
Ordovician	Ramshorn and Clayton Mine Slate (ID)	2
	Eureka Quartzite (UT, ID)	3
	Marjum, Weeks, Notch Peak Fms. (UT)	12
Cambrian	Quartzite of Clarks Basin (UT, ID)	27
Precambrian	Prichard and Revett Fms. (ID, MT, WA)	14
	Quartzite of Tin Cup Mountain (ID)	1
	Quartzite of Yost (UT)	1
	Schist of Stevens Spring and Inkom Fm. (UT)	3
	Elba Quartzite (UT, ID)	23
	Adamellite Gneiss (UT, ID)	4
--	Unknown	51
TOTAL		216

Ss-sandstone; Fm-formation; Ls-limestone

in the north, to the Wah Wah Mountains and San Francisco Mountains in the southwest (Hintze, 1988, p.203).

The area in northwestern Box Elder County, Utah and southern part of adjacent Cassia County, Idaho are somewhat remarkable, as this area contains the highest concentration of stone quarries of any area in the this study. This area lies about 15 miles (mi) east of Utah's border with Nevada, along the north-trending Grouse Creek Mountains on the west and includes much of the Raft River Range on the east. The northward extent of the Grouse Creek Mountains in Idaho is called Middle Mountain. The Albion Range of mountains lies east of Middle Mountain and north of the Raft River Range (plate 2). The southward extension of the Middle Mountain in Utah is called Cotton Thomas.

Rocks in the Box Elder-Cassia Counties area are also a part of the Raft River-Grouse Creek-Albion metamorphic core complex that reached its highest grade of metamorphism during the Jurassic-Cretaceous Periods and that later uplifted during the Oligocene Epoch.

The Quartzite of Tin Cup Mountain, mined in one quarry in Fremont County in the eastern Centennial Mountains of Idaho, consists of an older Precambrian age foliated quartzite containing muscovite, fuchsite, sericite, and chlorite minerals (Witkind, 1976).

Precambrian rock units of Mesoproterozoic ages include the Prichard and Revett Formations mined in 14 quarries located in western Montana, Idaho, and northeast Washington. These units range in age from 2.3 to 2.5 billion years old, and occur in the lower part of the Belt Basin of that region. The Prichard Formation, in the lowermost unit in the Belt Basin, is as much as 19,000 ft thick. This formation ranges in composition from shale to mud to silty shale and is named siltite or argillite because of it lower metamorphic grade. Rocks in the upper part of the Prichard Formation contain the flagstone of a quality that is useful for construction. The Revett Formation, found about 4000 ft stratigraphically above the Prichard, is about 3200 ft thick and consists of interbedded quartzite and silty shale of low metamorphic grade. The Revett is known for >2-inch (in)-thick flagstone blocks.

Units of the Cambrian Period, including the Quartzite of Clarks Basin and calcareous units (from youngest to oldest, the Marjum, Weeks, and Notch Peak Formations) are present and quarried at 40 quarries in Utah. The Notch Peak and the Marjum Formations are quarried throughout much of the Basin and Range province, whereas the Weeks is present only in the House Range located west of Fillmore, Utah. Each of these units consists largely of limestone, although

the Marjum contains a high proportion of shale. The Quartzite of Clarks Basin in the Raft River Range reaches 400 ft in thickness, and each of the three calcareous formations reach 1200 ft in thickness.

Rock units of the Ordovician Period, the Eureka Quartzite in Utah and the Clayton Mine Slate and the underlying Ramshorn Slate in Custer County, Idaho, are mined at five quarries. The Kinnickinic Quartzite, renamed the Clayton Mine Slate, is equivalent to the Eureka Quartzite (Hintze, 1988) of Utah. The Clayton Mine Slate and the Ramshorn Slate both exceed 1000 ft thick (Foster, 1972). In Utah, the Eureka Quarztite ranges from 200 to 550-ft thick, and extends over much of Box Elder, Tooele, Juab, Millard, Beaver, and Iron Counties of western Utah.

Five quarries are found in units of Mississippian through Permian Periods in Utah: the Humbug and Callville Formations and the Oquirrh Group. Three of these quarries are in the Callville, which occurs in Beaver, Iron, and Washington counties in southwest Utah. The Callville is a marly unit with shale stringers which ranges in thickness from 100 to 500 ft. The Oquirrh and Humbug occur throughout much of northwest and north central Utah and consist of calcareous units mixed with sandstone. The Oquirrh reaches thicknesses in excess of 17,000 ft in the Provo and Tintic Mountains areas.

Thirteen quarries are in Triassic Period rocks of the Chinle and Moenkopi Formations found in central, southern, and southeastern Utah. Rock from five of these quarries is from the Shinarump Conglomerate Member of the Chinle Formation. The Moenkopi occurs mainly in south central Utah and is discussed later in this report. These strata reach thicknesses up to 2500 ft and consist of light-, medium-, and dark-reddish brown sandstone with few argillaceous interbeds.

Eleven quarries are found within Jurassic rocks that include the Navajo Sandstone of southern Utah and Arizona, and the Nugget Sandstone of northern Utah, southwestern Wyoming, and southeastern Idaho. Thickness of these units ranges from 700 ft in northeast Utah, including southwest Wyoming and southeast Idaho, to over 3000 ft in the southwest part of Washington County, Utah.

Seven quarries found in Pennsylvanian-Jurassic orthogneiss or quartzite are spread across the Kettle-Okanogan Metamorphic Gneiss Dome complex in northeast Washington State. Orthogneiss is found mainly in the north-central part of Washington on the eastern foothills of the Cascade Mountains, whereas the quartzite and mafic gneisses occur on the east edge of the gneiss dome near the Kettle Thrust fault located on the west shore of the Columbia River and near the border with Canada.

At least seven quarries are found within Upper Cretaceous Period units of either the Dakota Formation of south and southeast Utah, or the Frontier Formation of northeast Utah-southwest Wyoming. Clinker or burned shale is extracted from five quarries in the Dakota Sandstone north of Kanab or the Dakota Sandstone near Blanding. Three quarries mine the Oyster Ridge Limestone Member of the Frontier Formation of southwest Wyoming.

Twenty-three quarries or surface collection sites are within either the Colton or overlying Green River Formations of Eocene Epoch in eastern Utah. Flagstone is mainly removed from sandstone ledges in a mudstone- to claystone-dominated sequence. The quarries are located mainly in the Uinta Basin south of the towns of Vernal and Duchesne, where the strata reach a maximum thickness of 10,000 ft. A substantial thickness of the Green River Formation is present along the east side of the transitional hinge line zone as far south as Richfield. Calcareous sandstone of the Green River Formation is removed from several quarries in the area east of the city of Mayfield.

Ten quarries are found in volcanic rocks of Miocene, Oligocene, or Holocene Epochs in the vicinity of the Tushar and Wah Wah Mountains, and in the hingeline zone near Fillmore and Richfield in southwest Utah. The sites are located in: (1) sandstone of the Oligocene Bear Valley Formation in western Garfield County, (2) sandstone and rhyolite of the Oligocene-Miocene Bullion Canyon Volcanics or Miocene Joe Lott Tuff Member of the Mt. Belknap Volcanics of southwest Sevier County, (3) Miocene Steamboat Rhyolite of central Beaver County, and (4) Holocene basalt flows found in western Garfield County.

Surface collection areas in rhyolitic tuff are scattered across southern Idaho. Two such areas are in the Miocene Tuff of Goose Creek (Armstrong and others, 1978) at the T. Rodriguez area west of Oakley, Idaho and from a rhyolite unit at Maad Mountain in Clark County, Idaho.

BUILDING STONE DATABASE

Method

The sources of data for this chapter include site examination notes, photographs, interviews with company personnel, records from State of Utah agencies, and other cited reports.

The examination of quarries or yards (collectively known as sites) was the first step in the collection of data for this report. The primary objective was to investigate the quarries located on federal lands. For example, quarries may occur on mining claims for locatable minerals, or stone can only be sold from exclusive or non-exclusive material sale sites, community pits, common use and free use areas. Geologists and engineers from the various BLM and FS field offices provided their local expertise and contributed a considerable amount of technical data about the stone quarries and local markets in their area of responsibility.

Table 2 lists the numbers of quarry and yard sites examined in the study area. Several additional sites not examined and not listed in this table were taken from the SubTerra (2004) study. The quarry sites included in this study are plotted on three large maps, called plates 1 through 3. At the time of visit to these quarries or stone yards, written notes about the sites were recorded on a Quarry Data Sheet (appendix 1) and were then transferred to an electronic spreadsheet (Stone_sites.txt) (appendix 2) also included with this report. The data compiled in the spreadsheet includes: site name, location, ownership, mine method, material removed, geology, unusual deposit characteristics, production rate, equipment, personnel, products, inventory, transportation, costs, sales prices, market conditions, product destinations, and use. The spreadsheet also contains relevant data about operational or retail yards. Company personnel were consulted, where possible, for specific information, such as type and number of employees, pay rates, production rate, and sales,

market, and product data. Representative rock samples of the marketed product were collected and photographs recorded the equipment, the quarry layout, and the rock products.

Data about 111 sites were also compiled from public documents at DOGM and about 27 sites from confidential documents at SITLA. SITLA confidential data are included only in aggregated form to avoid disclosing of company-confidential data. Information from about 46 sites visited by SubTerra but not visited by the author was added to the database.

In the Location by State columns found in Table 2, the current status of raw prospects, explored sites, proposed sites, active quarries, inactive quarries and past producing quarry sites or yards are listed by the number in each state. Operating status of quarries is based on data collected during examinations of sites, by DOGM or, determined during this study. Proposed sites are defined as sites where no disturbance or little disturbance has occurred but mine permitting may be underway. Raw prospects are sites where no disturbance has occurred. Explored sites are those where a disturbance has occurred and are usually operated under a permit. Active or active-intermittent sites are permitted mining operations and represent the largest group. Inactive sites are those that have not experienced recent activity, although they remain under bond or have a current mining permit. Past producers are inactive sites where the mine permit has been closed and the sites may be reclaimed.

Oversize Maps

Included with this chapter are three oversize maps, Plates 1, 2, and 3. It is recommended that the reader use these maps during reading of chapters of this report. Plate 1 shows the locations of all quarries and yards investigated within the state of Utah. Plate 1 is a large (E size) map sheet and measures about 36 in x 42 in. The detail of the area in extreme northwestern Utah is an area of special interest. Plate 2 includes additional detail in this area of special interest located along the border of northwestern Utah (in Box Elder County) with south-central Idaho (in Cassia County). This area includes the Raft River Range, and an area of the Grouse Creek Mountains called Cotton Thomas in Utah; and Middle Mountain, and the Albion Mountain Range in Idaho. This area contains the greatest concentration of stone quarries and related stone yards of any area in this investigation. Operations about this area of special interest are discussed in more detail later in this chapter (Salt Lake and Burley BLM Field Offices and Sawtooth National Forest) and in later chapters of this report. Plate 3 displays the remaining area of study including other quarries and yards located in the states of Wyoming, Idaho, Montana, and Washington.

The Plates 1 through 3 locate the positions of each of the stone quarries and yards. Yards are located by an "X" symbol. Each quarry is located by a color- and shape-coded symbol to indicate its size and land ownership. The size (indicated by symbol color) may be small, medium, or large based on the number of tons the quarry produces (or is believed capable of producing) on an annual basis. Small means the quarry can produce 0-200 tons per year. A Medium size quarry can produce 200 to 2,000 tons per year and Large quarries can produce more than 2,000 tons annually. The four symbol shapes of square, triangle, circle, or star are used to indicate the categories of land ownership for each quarry. Squares and triangles indicate the quarry is located on federal lands, managed by BLM or FS. The square indicates quarry sites on federal land where the stone is sold through a material sale, community pit, common use, or free use area. The triangle symbol indicates the quarry is on federal land and operates on mining claims. The circle symbol indicates the quarry is located on state or private lands. The star symbol indicates the ownership is unknown. Table 5 gives more information about ownership.

Excel Spreadsheet

Data collected during the examination of stone quarries and yards were compiled in a spreadsheet (or text file), Stone_sites.txt (appendix 2), using Microsoft 2002 Excel software. The same data also are provided in ASCII text format for users of other software. Like the oversize maps, the spreadsheet is also an essential part of this report. They can be used together or as stand-alone products from the text of the report. The spreadsheet contains a detailed summary that describes each quarry or yard investigated during the course of this study. The spreadsheet file, Stone_sites.txt is compiled from information taken from the following sources: (1) Quarry Data Sheets (appendix 1), (2) operators, (3) SITLA or DOGM records, and (4) SubTerra (2004). Each line in the

Table 2. *Current operating status reported by number and location of quarries and yards.*

Current Operating Status*	**Location by State**						**Total**
	Utah	**Idaho**	**Wyo.**	**Wash.**	**Mont.**	**Ariz.**	
Raw prospect (includes outcroppings)	4						4
Explored prospect	8			1			9
Proposed site or quarry	4						4
Active site or quarry	96	20	3	6	8	1	134
Inactive site or quarry	39	2		3	2		46
Past producer site or quarry	19						19
Total	170	22	3	10	10	1	216
Operations, wholesale, or retail yards	10	9	2	1	3	1	26
Total	180	31	5	11	13	2	242

* US Bureau of Mines terminology

spreadsheet describes up to 78 aspects of each property. If the same quarrying operation was extracting rock from two or more pits (for example, Scrivanich, section 3, lower pit; Scrivanich, section 3, upper pit…), then the number of records in this spreadsheet (and the number of rock samples collected) corresponds to the number of pits visited within the property. The spreadsheet is also large, if printed. To print with 10-point Times Roman typeface requires six, 36- x 42-inch sheets (E size sheet) of paper or 25 pages of 8.5- x 11-in size paper. In addition to describing the quarries and yards, a secondary purpose was to gather data to classify stone by geology (lithology, source formation, color) and quality (fractures, cleavability, texture, thickness, etc.) and to permit costing of operations.

The structure of the spreadsheet and contents of data fields found in Stone_sites.txt are summarized in Table 3. Items (headers in spreadsheet) 1-14 contain general and location information about each site, items 15-19 contain BLM, DOGM, SITLA and other file identification data, items 20-23 contain operator data, lines 24-34 are location data, lines 35-40 describe the rock and its characteristics, lines 41-46 contain descriptive data of the rock for building stone purpose, items 47-52 provide mine reserve and product data, item 53 is size in acres, items 54-55 describe the mining and hand processing methods employed, items 56-58 describe processing, items 59-60 contain data about personnel, items 61-63 contains data on buildings, products and inventory, items 64-66 contain sales and market data, items 67-76 are annual production data, item 77 is maximum production in any year from 1995-2004, and item 78 gives additional comments about the site or production. Character fields should be considered as a memo type of field for conversion of the ASCII file into a database file.

BUILDING STONE QUARRIES AND YARDS

Rock Yards

Rock yards examined were of three general categories: yards used mainly for an operations purpose such as maintenance of equipment, housing of employees, and processing of stone such as splitting, sorting, and stacking on pallets (operations), yards used mainly as shipping point or sales at wholesale prices (wholesale), and yards used solely for sales of products at retail prices (retail) (table 4). Yards are located on Plates 1 through 3. Operations and wholesale yards commonly had overlapping purposes.

Rock Quarries

Rock quarries and yards examined during this study are found within or near the boundaries formed by the 14 BLM field office areas and four National Forests in six states. Table 5 lists the number of sites by salable minerals categories, located claims, and ownership corresponding to a nearby federal land management boundary. Although state or private lands may not fall in the jurisdictions of a BLM field office or national forest, these management area boundaries are used for convenience in locating sites.

Tables 6 through 19 list quarries within the area of individual BLM field office (FO) or the National Forest (NF). Rock quarries shown on Plates 1-3 are identified by their relative size, or by the number of tons removed annually, as described above.

Salt Lake BLM Field Office area, Utah

Forty-nine quarries and two rock yards were examined within Box Elder, Summit, Tooele, Utah, and Wasatch Counties within the Salt Lake Field Office area in northern Utah. Quarries in Salt Lake County were not examined due to time contraints. Of the 24 quarries known on BLM lands, 18 were examined and sampled (table 6 and plates 1 and 2). Most of those in Box Elder County are developed in the Cambrian Quartzite of Clarks Basin, whereas a lesser number are developed in the Precambrian Elba Quartzite in the Raft River or Grouse Creek Mountains. Two quarries are found in the Adamellite Gneiss in the Vipont Mountains (aka north Grouse Creek Mountains). For example, the Limelight Green quarry (ID No. 108) (figure 2), is developed on the Cambrian Quartzite of Clarks Basin. The fewest sites are hosted in the Precambrian Quartzite of Yost, Precambrian Schist of Stevens Spring, and Ordovician Eureka Quartzite. Quarries in Summit and Wasatch Counties are in the Jurassic Nugget Sandstone. Geologic formations occurring in other quarries are either unknown or not determined.

More than 70 quarries and six rock yards are found in the mining area encompassing northwest Box Elder County, Utah and southern Cassia County, Idaho. This area includes three management areas of the Salt Lake BLM FO, the Burley BLM FO in Idaho, and the Sawtooth NF of both Utah and Idaho (see next section). This is the largest concentration of quarrying operations of any area examined (plates 1 and 2) where the Precambrian Elba Quartzite and Cambrian Quartzite of Clarks Basin are the most important sources of stone. The Quartzite of Clarks Basin is the most important source of building stone from quarries and is mined in nearly 50 percent of all area quarries. The Elba Quartzite is the second most important source of stone in area quarries and is mined in about 35 percent of quarries.

Burley Field Office area, Idaho and Sawtooth National Forest, Idaho-Utah

Twenty-five quarries and four rock yards were examined within the boundaries of the BLM Burley FO in Cassia County, Idaho and Minidoka Ranger District in the Sawtooth NF. The Minidoka RD includes lands in both Cassia County, Idaho and Box Elder County, Utah so National Forest lands straddle the Idaho-Utah border. All of the 15 quarries situated on BLM- or NF-Administered lands were examined (table 7 and plate 2). Quarries are developed mainly in the Elba Quartzite in Cassia County and generally in the Cambrian Quartzite of Clarks Basin in Utah (figure 3). The Corner Creek quarry in Utah is developed in the Elba Quartzite and the Rodriquez material sale site is developed in a platy rhyolite of Miocene age that is a widely available volcanic source of stone around Middle Mountain and the Albion Mountains of Idaho. Two new Utah quarries were in the permitting stage in 2004 and the Vertical Cloud (ID No. 52) site is another proposed stone quarry site. The Interstate quarry (ID No. 48) was reclaimed in 2004. The Sawtooth NF determined that the quarried stone at Fish Creek (19), Interstate

Table 3. *Spreadsheet table structure for Stone_sites.txt.*

(Char – character, Num – numeric, Dec – Significant digits to right of decimal; Memo – Memorandum or free-form)

#	Name of field	Type	Dec	Explanation
1	IDNo	Char	--	Identifier number for rock quarry, mill site, or yard
2	Name	Char	--	Name of rock quarry, mill site, or yard
3	Alt_name	Char	--	Alternate name of rock quarry, mill site, or yard
4	Location_State	Char	--	State where quarry, mill site, or yard is located
5	Surface_Mgmt	Char	--	Federal, state, or private ownership
6	Case_Type	Char	--	Claims, material site, common use, community pit, other
7	Visited	Char	--	Inspection made (yes, no)
8	Photos	Char	--	Photographs taken (yes, no)
9	Sampled	Char	--	Sample taken (yes, no)
10	Date_Visit	Char	--	Date of inspection
11	Status	Char	--	Status of operation (active, inactive…)
12	Map_Name	Char	--	Name of map
13	Type_Site	Char	--	Nature of site (quarry, yard, mill site…)
14	Claim_Name	Char	--	Name of mining claim
15	BLM–Case	Char	--	BLM case number
16	SubTerra_Number	Char	--	SubTerra file number
17	UT–DOGM_ID	Char	--	Utah DOGM case identifier
18	UT–SITLA_ID	Char	--	Utah SITLA case identifier
19	Data_Source	Char	--	Source of data
20	Operator_Name	Char	--	Name of operator
21	Operator_Address	Char	--	Address of operator
22	Operator_State	Char	--	State of operator
23	Operator_Tele	Char	--	Telephone of operator
24	Location_Descr	Char	--	Descriptive driving directions to site
25	Location_county	Char	--	County of site
26	Tp	Char	--	Township of site
27	Rg	Char	--	Range of site
28	Sec&Sub	Char	--	Section and subdivision
29	Lat_dd	Num	4	Latitude in decimal degrees, north (xx.xxxx)
30	Long_dd	Num	4	Longitude in decimal degrees, west (yyy.yyyy)
31	UTM_E	Num	0	UTM easting coordinate
32	UTM_N	Num	0	UTM northing coordinate
33	UTM_Zone	Char	--	UTM zone
34	Coll_Method	Char	--	Method of collection of lat-long or UTM (GPS recorded, copied, read from map)
35	Color	Char	--	Color of rock
36	Geology	Char	--	Geologic unit at site
37	Generalized_rock_unit	Char	--	Abbreviated form of geology, or formation or unit name (for GIS purpose)
38	Lithologic_description	Char	--	Type of material mined at site
39	Generalized_Lithology	Char	--	Abbreviated rock type or type of material mined (for GIS purpose)
40	Other characteristics	Char	--	Unusual characteristics of deposit
41	Extraction_Fractures–Cleavability	Char	--	Effect of fractures and cleavage in rock upon ease of extraction (Favorable, Unfavorable, or Not applicable)
42	Product_Dimension–Fractures_Cleavability	Char	--	Effect of fractures and cleavage in rock upon product dimensions (Favorable, Unfavorable, or Not applicable)
43	Influence_of_Texture	Char	--	Influence of texture on marketable product (Influence, Likely influence, or No influence)
44	Uniform_Thickness	Char	--	Uniform thickness of product (Yes, No)
45	Lithology_Hardness–Durability	Char	--	Quality of stone based on lithology (sandstone, limestone…) and hardness and durability (Advantageous, Moderately advantageous, Disadvantageous)
46	Rock_Quality_Suitability	Char	--	Subjective judgment to describe the relative quality and suitability of rock for an intended purpose in the market (fair, moderate, good, excellent)
47	Size	Char	--	Size, based on annual production, and type of site, large (>2,000 tons), medium (200-2000 tons), or small (<200 tons)
48	Ease_of_Extraction	Char	--	Ease of extraction of rock at quarry based on hardness, access, overburden, and other properties (Very easy, Moderately easy, Moderately difficult, Difficult)

(Char – character, Num – numeric, Dec – Significant digits to right of decimal; Memo – Memorandum or free-form)

49	Extent_of_Deposit	Char	--	Description of spatial nature of deposit (Surficial, Limited or confined, Extended)
50	Reserve_Limits_Overburden	Char	--	Subjective judgment of quantity of reserve and amount of overburden
51	Number_Products	Char	--	Number of quarry-run products (1-2 products, 3-5 products, >5 products)
52	Known_Products	Char	--	A list of common products removed from quarry

Table 3. *Spreadsheet table structure for Stone_sites.txt (continued)*

(Char – character, Num – numeric, Dec – Significant digits to right of decimal; Memo – Memorandum or free-form)

#	Name of field	Type	Dec	Explanation
53	Acres	Char	--	Acreage
54	Mining_method	Char	--	General description of all mining methods (to facilitate constructing table used in text)
55	Hand_methods	Char	--	General description of hand methods (to facilitate constructing table used in text)
56	Mining_description	Char	--	Detail description of mining methods
57	Production_rate	Char	--	Rate of production of operation, daily or annually
58	Processing_onsite	Char	--	Nature of onsite processing
59	Work_schedule	Char	--	Work schedule of personnel
60	Personnel	Char	--	Type and number of personnel
61	Buildings	Char	--	Buildings on site
62	Equipment	Char	--	Equipment used at site
63	Product_inventory	Char	--	Inventory of products at site
64	Sales_price	Char	--	Selling price of products
65	Market_description	Char	--	Nature of market for product
66	Destination	Char	--	Shipping destination for product
67	Prod_1995	Num	0	Production in 1995, if available, NR=not recorded, confid.=confidential
68	Prod_1996	Num	0	Production in 1996, if available, NR=not recorded, confid.=confidential
69	Prod_1997	Num	0	Production in 1997, if available, NR=not recorded, confid.=confidential
70	Prod_1998	Num	0	Production in 1998, if available, NR=not recorded, confid.=confidential
71	Prod_1999	Num	0	Production in 1999, if available, NR=not recorded, confid.=confidential
72	Prod_2000	Num	0	Production in 2000, if available, NR=not recorded, confid.=confidential
73	Prod_2001	Num	0	Production in 2001, if available, NR=not recorded, confid.=confidential
74	Prod_2002	Num	0	Production in 2002, if available, NR=not recorded, confid.=confidential
75	Prod_2003	Num	0	Production in 2003, if available, NR=not recorded, confid.=confidential
76	Prod_2004	Num	0	Production in 2004, if available, NR=not recorded, confid.=confidential
77	Max_production_tons	Num	0	Maximum production recorded in any year during period 1995-2004, in tons unless noted otherwise
78	Comments	Char	--	General comments; units are tons unless noted; DOGM and SITLA are source of data unless noted otherwise

Table 4. *List of rock yards.*

#	Name of rock yard	Type site*	State	County	Management Area	City/Town
83	Silver Arrow Stone Co.	Retail	AZ	Mohave	St. George FO	Fredonia
239	Ace Hardware/Spring Creek Stone	Retail	ID	Bonner	Kootenai NF	Hope
238	American Stone	Operations	ID	Cassia	Burley FO-Sawtooth NF	Oakley
229	Northern Stone Supply	Wholesale	ID	Cassia	Burley FO-Sawtooth NF	Oakley
230	Oakley Stone	Wholesale	ID	Cassia	Burley FO-Sawtooth NF	Oakley
226	Rocky Mountain Supply	Retail	ID	Bonneville	Idaho Falls FO	Idaho Falls
6	Scrivanich	Operations	ID	Cassia	Burley FO-Sawtooth NF	Oakley
--	Southwest Stone	Retail	ID	Bear Lake	Pocatello	Montpelier
227	Squires Brick	Retail	ID	Bonneville	Idaho Falls FO	Idaho Falls
139	Tin Cup	Operations	ID	Fremont	Idaho Falls FO	Island Park
137	Tin Cup Mining, Thornton	Wholesale	ID	Madison	Idaho Falls FO	Thornton
27	Montana Rock Works	Retail	MT	Flathead	Kootenai NF	Kalispell
28	Montana Stone Supply	Wholesale	MT	Flathead	Kootenai NF	Marion
29	Stone Central	Wholesale	MT	Sanders	Kootenai NF	Hot Springs
232	3-H Landscaping Products	Retail	UT	Washington	St. George FO	St. George
240	Bonneville quarries	Operations	UT	Box Elder	Salt Lake FO	Park Valley
231	Cedar Building Supply	Retail	UT	Iron	Cedar City FO	Cedar City
233	Feller Stone	Wholesale	UT	Washington	St. George FO	Veyo
237	Gold Star Stone	Operations	UT	Box Elder	Salt Lake FO	Lynn
236	Rocanville Stone	Wholesale	UT	Millard	Fillmore FO	Delta
60	Rock-It Stone Works	Wholesale	UT	Uintah	Vernal FO	Duchesne
235	Rowland Stone	Retail	UT	Washington	St. George FO	St. George
234	Wal-Mart	Retail	UT	Iron	Cedar City FO	Cedar City
228	April Garden Center	Retail	WA	Spokane	Colville-Okanogan NF	Deer Park
131	Cumberland Gap Hearth Stone	Operations	WY	Lincoln	Kemmerer FO	Kemmerer
132	Severns Stone	Wholesale	WY	Lincoln	Kemmerer FO	Kemmerer

NF=National Forest FO=BLM Field Office
Some wholesale or operations sites are operated on mill site mining claims or free use permits.

Table 5. *Number of quarry sites and yards by management boundary, management method of salable minerals, or ownership.*

State	Boundary	County	Salable Minerals			Located Claim	Ownership			Yard	Total
			Common Use	Community Pit	Material Site		State Lands	Private	Unknown		
AZ	Kanab FO-Ariz. Strip FO	Mohave		1						1	2
ID	Burley FO	Cassia			1	5		9		4	19
ID	Challis FO	Custer				1				1	2
ID	Idaho Falls FO	Bingham		1							1
ID	Idaho Falls FO	Bonneville								2	2
ID	Idaho Falls FO	Clark	1								1
ID	Idaho Falls FO	Jefferson								1	1
ID	Kootenai NF	Bonner						1			1
ID	Pocatello FO	Bear Lake		1							1
ID	Targhee NF	Clark				1				1	2
ID-UT	Sawtooth NF	Cassia				1					1
ID-UT	Sawtooth NF	Box Elder			1	8					9
MT	Kootenai NF	Flathead								2	2
MT	Kootenai NF	Lincoln			1		1	3			5
MT	Kootenai NF	Sanders						3	2	1	6
UT	Cedar City FO	Beaver			1	4	1		3		9
UT	Cedar City FO	Iron			2	1				2	5
UT	Fillmore FO	Juab			1	3			2		6
UT	Fillmore FO	Millard	1	2	1	12	1		5	1	23
UT	Kanab FO	Garfield		1	1						2
UT	Kanab FO	Kane		1	2		1		1		5
UT	Moab FO	Grand				1			1		2
UT	Monticello FO	San Juan				1	3		1		5
UT	Price FO	Carbon				1			1		2
UT	Price FO	Emery					1		1		2
UT	Richfield FO	San Pete					9	1	1		11
UT	Richfield FO	Sevier			3	2					5
UT	Richfield FO	Piute							1		1
UT	Richfield FO-Hanksville FS	Wayne		1	1	1	2			1	6
UT	Salt Lake FO	Box Elder		4		17	2	9	4	2	38
UT	Salt Lake FO	Summit						5	1		6
UT	Salt Lake FO	Toole				1					1
UT	Salt Lake FO	Utah				1		2			3
UT	Salt Lake FO	Wasatch						2	1		3
UT	St George FO	Washington		1	3	8	2		3	3	20
UT	Vernal FO	Duchesne			3		2		1		6
UT	Vernal FO	Uintah	1		4	1	3			1	10
WA	Okanogan-Colville NF	Ferry			1	1		2			4
WA	Okanogan-Colville NF	Okanogan						2			2
WA	Okanogan-Colville NF	Pend Oreille				2		2			4
WA	Okanogan-Colville NF	Spokane								1	1
WY	Kemmerer FO	Lincoln		1		2				2	5
			3	14	26	75	28	41	29	26	242
							Total quarries: 216			Total yards: 26	

Table 6. *List of sites in the Salt Lake BLM Field Office area.*

(Click on link in Rock-Color column for additional descriptive data)

ID No	State-County	Name	Surface Ownership	Size-Type	Geologic Unit	Rock-Color
97	UT-Box Elder	Aspen (DOGM's Cotton Thomas)	Private/Salt Lake FO	Large	Quartzite of Clarks Basin (Є)	Quartzite-Reddish brown
96	UT-Box Elder	Autumn Gold	Private/Salt Lake FO	Medium	Quartzite of Clarks Basin (Є)	Quartzite-Light gray
172	UT-Box Elder	Briggs Quarry	Private	Large	Quartzite of Clarks Basin (Є)	Quartzite-Light gray
90	UT-Box Elder	Buckskin	Private/Salt Lake FO	Medium	Quartzite of Clarks Basin (Є)	Quartzite-Light gray
91	UT-Box Elder	Cotton Thomas outcrop	Salt Lake FO	--	Quartzite of Clarks Basin (Є)	Quartzite
113	UT-Box Elder	Dove Creek Pass	State of Utah lease/Private	Medium	Quartzite of Clarks Basin (Є)	Quartzite-White
87	UT-Box Elder	Dove Creek Pass outcrop	Salt Lake FO	--	Quartzite of Clarks Basin (Є)	Quartzite
112	UT-Box Elder	Dove Creek Pass trespass	Salt Lake FO	Small	Eureka Quartzite (Ord.)	Quartzite-White
102	UT-Box Elder	Fisher Creek quarry	Salt Lake FO	Small	Elba Quartzite (pЄ)	Quartzite-Turquoise green
101	UT-Box Elder	Glacial Green #1	Salt Lake FO	Medium	Elba Quartzite (pЄ)	Quartzite-Turquoise green
98	UT-Box Elder	Gneiss-ridge line (reclaimed)	Salt Lake FO	Small	Adamellite gneiss (pЄ)	Orthogneiss-Light gray
86	UT-Box Elder	Goose Creek talus #2	Private/Salt Lake FO	Small	Quartzite of Clarks Basin (Є)	Quartzite-Light gray
88	UT-Box Elder	Goose Creek unnamed talus and pit	Unknown	Small	Quartzite of Clarks Basin (Є)	Quartzite-Light gray
89	UT-Box Elder	Granite - 14N-17W-17	Private/Salt Lake FO	Small	Adamellite gneiss (pЄ)	Orthogneiss-Medium gray
188	UT-Box Elder	Green Beetle	Salt Lake FO	Medium	Eureka Quartzite (O)	Quartzite
109	UT-Box Elder	Green Peak	Salt Lake FO	Medium	Quartzite of Clarks Basin (Є)	Quartzite-Light green
106	UT-Box Elder	Grouse Creek Mountains quarry	Salt Lake FO	Small	Elba Quartzite (pЄ)	Quartzite-Medium brown
104	UT-Box Elder	Grouse Creek Mountains quarry, lower end of talus	Salt Lake FO	Medium	Elba Quartzite (pЄ)	Quartzite-Medium brown
105	UT-Box Elder	Grouse Creek Mountains quarry, upper end of talus	Salt Lake FO	Large	Elba Quartzite (pЄ)	Quartzite-Medium brown
115	UT-Box Elder	Kimbell Creek landscape rock area	Salt Lake FO	Small-Material Site	Elba Quartzite (pЄ)	Quartzite-Gray
116	UT-Box Elder	Kimbell Creek landscape rock, tower area	Salt Lake FO	Small-Material Site	Elba Quartzite (pЄ)	Quartzite-Gray
108	UT-Box Elder	Limelight Green quarry	State of Utah lease/Private	Large	Quartzite of Clarks Basin (Є)	Quartzite-Light greenish gray
114	UT-Box Elder	Lion Heart #1-#2	Salt Lake FO	Medium	Quartzite of Yost (pЄ)	Quartzite-Light gray
95	UT-Box Elder	Lone Pine (new pit)	Private	Large	Quartzite of Clarks Basin (Є)	Quartzite-Light gray

Table 6 *(continued)*

ID No	State-County	Name	Surface Ownership	Size-Type	Geologic Unit	Rock-Color
99	UT-Box Elder	Lynn Pass quarry	Private/Salt Lake FO	Small	Quartzite of Clarks Basin (Є)	Quartzite-Light gray
166	UT-Box Elder	Lynn School quarry (DOGM's Lynn Pass)	Private	Large	Schist of Stevens Spring (pЄ)	Quartzite-Very light gray
100	UT-Box Elder	Lynn Spring quarry	Salt Lake FO	Medium	Quartzite of Clarks Basin (Є)	Quartzite-White
103	UT-Box Elder	Raft River community pit	Salt Lake FO	Small-Material site	Quartzite of Clarks Basin (Є)	Quartzite-Light gray
85	UT-Box Elder	Rosebud #1-2/Sage Green	Salt Lake FO	Medium	Quartzite of Clarks Basin (Є)	Quartzite-Light green
110	UT-Box Elder	Rosebud community pit	Salt Lake FO	Small-Material site	Quartzite of Clarks Basin (Є)	Quartzite-Light gray
111	UT-Box Elder	Sagers Dove Creek Pass quarry	Salt Lake FO	Medium	Quartzite of Clarks Basin (Є)	Quartzite-White
93	UT-Box Elder	Sawtooth (unnamed) main quarry	Salt Lake FO	Large	Quartzite of Clarks Basin (Є)	Quartzite-White
189	UT-Box Elder	Skyline Pine quarry	Salt Lake FO	Medium	Elba Quartzite (pЄ)	Quartzite-Gray
107	UT-Box Elder	Turquoise quarry	Salt Lake FO	Large	Elba Quartzite (pЄ)	Quartzite-Turquoise green
92	UT-Box Elder	Unnamed Gold Star	Private/Salt Lake FO	Medium	Quartzite of Clarks Basin (Є)	Quartzite-White
84	UT-Summit	Brown's Canyon #1	Private	Large	Nugget Sandstone	Sandstone
241	UT-Summit	Brown's Canyon (D. Wurth)	Private	Large	Nugget Sandstone	Sandstone-Light brown
193	UT-Summit	Brown's Canyon Rock quarry	Private	Large	Nugget Sandstone	Sandstone
160	UT-Summit	Huff Creek	Unknown	Small	?	?
194	UT-Summit	Park City Stone mill	Private	Small	Nugget Sandstone	Sandstone
199	UT-Summit	Peoa Blonde quarry	Private	Large	Nugget Sandstone	Sandstone
161	UT-Tooele	Aragonite mine	Private	Small	Oquirrh Formation	Limestone
181	UT-Utah	Amis #1	Private	Medium	Colton Formation	Sandstone
192	UT-Utah	Dove Gray quarry	Private	Small	Colton Formation	Sandstone
201	UT-Utah	Horse Creek	Salt Lake FO	Small	Colton Formation	Sandstone
200	UT-Wasatch	Heber quarry	Unknown	Large	Navajo Sandstone	Sandstone-Reddish brown
210	UT-Wasatch	Heber Red	Private	Medium	Navajo Sandstone	Sandstone
202	UT-Wasatch	Santa Barbara quarry	Unknown	Small	?	Sandstone

Figure 2. *Limelight Green quarry in south Grouse Creek Mountains, Salt Lake Field Office area.* ***Top:*** *Aerial view of Limelight Green quarry (108) operated on a State of Utah lease in Box Elder County, Utah. View is north along the east side of Grouse Creek Mountains with Raft River Range visible in the distance.* ***Bottom:*** *Hand splitting and sorting of quartzite flagstone in Limelight Green quarry, T. 10 S., R. 16 E., section 2 SE¼SE¼. Courtesy of Northern Stone Supply.*

Table 7. *List of quarry sites in the Burley BLM Field Office area and Sawtooth National Forest.*

ID No	State-County	Name	Surface Ownership	Size-Type	Geologic Unit	Rock-Color
19	ID-Cassia	Fish Creek	Sawtooth NF	Large-Locatable[4]	Elba Quartzite (p€)	Quartzite-Light gray
10	ID-Cassia	Northern Stone-Granite quarry 1	Private	Large	Orthogneiss (Olig.)	Orthogneiss-Dark gray
11	ID-Cassia	Northern Stone-Granite quarry 2	Private	Large	Orthogneiss (Olig.)	Granitic-Dark gray
12	ID-Cassia	Northern Stone-Middle Gold quarry	Private	Large	Elba Quartzite (p€)	Quartzite-Light greenish gray
13	ID-Cassia	Northern Stone-Reds Middle quarry 1	Private	Large	Elba Quartzite (p€)	Quartzite-greenish gray
14	ID-Cassia	Northern Stone-Reds Middle quarry 2	Private	Large	Elba Quartzite (p€)	Quartzite-Medium greenish gray
15	ID-Cassia	Northern Stone--Silver quarry	Private	Large	Elba Quartzite (p€)	Quartzite-Light greenish gray
16	ID-Cassia	Northern Stone--South quarry	Private	Large	Elba Quartzite (pC)	Quartzite-Light greenish gray
17	ID-Cassia	Northern Stone--Top quarry	Private	Large	Elba Quartzite (p€)	Quartzite-White
18	ID-Cassia	Northern Stone--Upper south quarry	Private	Large	Elba Quartzite (p€)	Quartzite-Very light gray
1	ID-Cassia	Scrivanich - Section 3 lower quarry	Burley FO	Large	Elba Quartzite (p€)	Quartzite-Light greenish white
2	ID-Cassia	Scrivanich - Section 3 upper quarry	Burley FO	Large	Elba Quartzite (pC)	Quartzite-Light greenish white
3	ID-Cassia	Scrivanich-Rodriguez-section 10 lower quarry	Burley FO	Large	Elba Quartzite (p€)	Quartzite-Light gray
4	ID-Cassia	Scrivanich-Rodriguez--section 10, 1	Burley FO	Large	Elba Quartzite (p€)	Quartzite-Light gray
5	ID-Cassia	Scrivanich-Rodriguez--section 10, 2	Burley FO	Large	Elba Quartzite (p€)	Quartzite-Light gray
7	ID-Cassia	T. Rodriguez	Burley FO	Small-Material site	Rhyolite tuff of Goose Creek (Mio.)	Rhyolite tuff-Gray
45	UT-Box Elder	Corner Creek area	Sawtooth NF	Medium-Material site CVD[5]	Elba Quartzite (p€)	Quartzite-White
46	UT-Box Elder	Dove Creek, lower quarry (Clarks Basin)	Sawtooth NF	Large-Locatable	Quartzite of Clarks Basin (€)	Quartzite-White
47	UT-Box Elder	Dove Creek, upper quarry (Clarks Basin)	Sawtooth NF	Medium-Locatable	Quartzite of Clarks Basin (€)	Quartzite-White
177	UT-Box Elder	Henrietta (Black Hills)	Sawtooth NF	Small	Eureka Quartzite (O)	Quartzite
48	UT-Box Elder	Interstate quarry	Sawtooth NF	Small-Locatable	Quartzite of Clarks Basin (€)	Quartzite-White
49	UT-Box Elder	Johnson Creek quarry	Sawtooth NF	Small-CVD	Schist of Stevens Spring (p€)	Quartzite-White
100	UT-Box Elder	Lynn Spring quarry	Sawtooth NF, Salt Lake FO	Medium-Locatable	Quartzite of Clarks Basin (€)	Quartzite-White
50	UT-Box Elder	Pine Springs	Sawtooth NF	Small-CVD	Quartzite of Clarks Basin (€)	Quartzite-White
51	UT-Box Elder	Shimmer Lady	Sawtooth NF	Small-CVD	Quartzite of Clarks Basin (€)	Quartzite-White
52	UT-Box Elder	Vertical Cloud	Sawtooth NF	--	Quartzite of Clarks Basin (€)	Quartzite-White

€ Cambrian, p€ Precambrian, O Ordovician, Mio. Miocene, Olig. Oligocene

[4]*Locatable—Common variety determination by Forest Service indicated a locatable mineral based on criteria that product can be split to thickness of 3/4-in.*

[5]*CVD—Common variety determination incomplete; current management is by material sale.*

Figure 3. *Dove Creek quarry in Clarks Basin, Sawtooth National Forest, Box Elder County, Utah.* ***Top:*** *Air-rotary drilling equipment used for blast holes to ready overburden for blasting. Blast holes were drilled on 4ft x 4ft square pattern to nine ft depth and loaded with 0.42 lbs. ANFO per ton of rock for removal of overburden to expose underlying desirable rock. To facilitate its removal, the underlying flagstone would be loosened by second blast. The quarry is developed in Quartzite of Clarks Basin (Cambrian) in T. 13 N., R. 16 W., section 14 NW1/4, Box Elder County, Utah.* ***Bottom:*** *Flagstone loaded on pallets at Bonneville Quarries Dove Creek-Clarks Basin quarry (ID No. 47). Flagstone less than one inch thick, a high unit value product, is stacked vertically to avoid breakage during shipment. Pallets weigh 3,200-4,400 pounds. Photos courtesy of Bonneville Quarries.*

(48) and Dove Creek Clarks Basin (46-47) quarries is a locatable (not salable) mineral.

Fillmore Field Office area, Utah

Twenty-nine quarries and the Rocanville rock yard (ID No. 236 in table 4), located in Delta, Utah, are within the area of the Fillmore FO area. Each of the 16 quarries situated on BLM or National Forest lands in Juab and Millard counties were examined (table 8). The Multi-colored Green Nos. 1-5 / Pitchforth Springs (ID No. 35) and Rocanville/Wing quarries (38-41, 205) of North Canyon are developed in a quartzite of the Precambrian Inkom Formation and siltstone and limestone of the Cambrian Weeks Formation, respectively (figure 4). These were the only quarries in operation when visited. Other quarries are developed in the Cambrian Notch Peak and Marjum Formations wheras some are located in Tertiary rhyolitic and tuffaceous units. Tuffaceous rocks with brightly-colored orange and light brown banding located in the Drum Mountains are exploited for additional artistic uses.

Cedar City BLM Field Office area, Utah

Twelve quarries and two rock yards are known in the area of the Cedar City Field Office area in Beaver and Iron Counties, Utah. Eight quarries situated on BLM lands were visited (table 9). Only the Bright (122) and Red Beryl (123) quarries were in operation in 2004. The rhyolite rock at Bright (122), Color Country Rock (125), and RMS No. 1-Mtn. Spring Peak (121)are quite similar; however Bright (122) and Color Country Rock (125) are exploited for crushed landscaping aggregate or large rhyolite boulders, whereas RMS No. 1-Mtn. Spring Peak (121) produces a hard siliceous rhyolite for fish aquariums. The Red Beryl (123) produces a red beryl gemstone, but its rubble waste is useful of landscape rock. The Picasso Marble Sliver 3-4 (128) and Color Country Rock (125) were inactive at time of field visit but showed evidence of recent activity (figure 5). Both Star Range (126) and White Elephant (127) are developed on white-colored dolomite. Paleozoic quartzite, limestone, and dolomite and Tertiary rhyolitic and tuffaceous units are mined in the district.

Richfield BLM Field Office area, Utah

Twenty-two quarries and one dimension stone processing plant are known within the boundary of the Richfield FO area or its satellite Henry Mountains Field Station located in Hanksville, Utah. Nine of the quarries visited are located on BLM and State of Utah lands in Sevier, Sanpete, and Wayne counties (table 10). Landscape and building limestone is mined from the Torrey Member of the Triassic Moenkopi Formation in Wayne County, the Eocene Green River Formation in Sanpete County, from tuffaceous sandstone or rhyolitic tuff of the Oligocene Bullion Canyon Volcanics, or from the Joe Lott Tuff Member of the Miocene Mount Belknap Volcanics in Sevier County (figure 6). Torrey Buff (198), American Stone (148), and Quality Stone (147) quarries near Torrey, Utah each quarry stone from the Moenkopi Formation. American Stone removes stone from mining claims while Quality Stone removes stone in large equally-sized blocks from a BLM material sale. American uses the stone for landscape purposes while Quality Stone's product is fashioned into dimension stone by sawing. It appears that Quality's (147) stone is less expensive to remove on a per-ton-basis. Also, the additional work to create a dimension stone product probably adds considerable value to Quality's product. Each of the Day-Temple Strike (141), Cream Time (Mayfield) (140), Cream Time (Young-Haas) (197), Nine Mile (162), and Bruce Haas 1 and 2 (224-225) quarries remove limestone from the upper part of the Green River Formation near Mayfield in Sanpete County, Utah.

St. George BLM Field Office area, Utah

Seventeen quarries and three yards located on lands of mixed ownership are within the boundaries of the St. George FO area. Eleven of the 13 quarries located on BLM lands and three rock yards on private lands were examined. (table 11). The larger quarry operation at Limestone Mesa (exclusive) material sale site (155) and Virgin community pit (156) is developed in the Virgin Limestone Member of the Triassic Moenkopi Formation (figure 7). The Harrisburg-Picture Spring 1, 2 (158), Windy #3 (157), and Black Ridge #1(154) also exploit sandstone in the Shinarump Member of the Chinle Formation that contains a varying liesegang color banding pattern. The Fire Pit #1-4 (150) and Sandstone Mountain (149) produce rock from the Jurassic Navajo Sandstone that contains a brilliant reddish orange coloration. The Dolomite Stone #1 (152) and Snow White (151) are developed on white dolomite rock of the Pennsylvanian Callville Limestone.

Vernal BLM Field Office area, Utah

Of a total of the 15 quarries and one yard in the Vernal Field Office area, ten sites were examined on BLM land and four sites were examined on State of Utah leases (table 12). Quarries in both Duchesne County and Uintah County, located south of Vernal, are developed in light brown sandstone of the upper part of the Eocene Green River Formation. The Chew Split Mountain quarry (53) on Blue Mountain, 15 mi east of Vernal, is found in the Shinarump Conglomerate Member of the Chinle Formation (figure 8). One rock yard is located in Duchesne, Utah.

Kanab BLM Field Office area, Utah and Arizona Strip Field Office, Arizona

Eight of the quarries were examined and sampled in the Kanab FO area of Kane and western Garfield counties, Utah (table 13), and two yards were visited. The yards are at the Moenkopi Moca pit (78) Hansen operations yard and saw plant (figure 9, middle) near Kanab, Utah and the Silver Arrow Stone Co. retail yard in Fredonia, Arizona. Quarries include the Bitter Spring community pit (77) developed in the Shinarump Member of the Triassic Chinle Formation and located south of Kanab in Mohave County Arizona and managed by the Arizona Strip FO. In Garfield County, quarried stone includes the green-colored sandstone at the Boundary quarry (76) north of Panguitch, Utah and the Red Canyon (82) basalt rip-rap west of the Bryce Canyon National Park entrance. Scoria and orange shale quarries (80-81, 174) in the Cretaceous Dakota Formation, the Moenkopi Moca quarry (78) in the Triassic Moenkopi Formation, and the Shinarump

Table 8. *List of sites in the Fillmore BLM Field Office area.*

(A link to additional descriptive data is provided in Rock-Color column for sites examined by the author)

ID No	State-County	Name	Surface Ownership	Size-Type	Geologic Unit	Rock-Color
118	UT-Juab	Bandstone	Fillmore FO	Small	?	Volcanic-Greenish gray
209	UT-Juab	Dog Valley #1 & #2	Fillmore FO	Small	?	?
120	UT-Juab	Drum slate quarry	Fillmore FO	Small	?	Quartzite-Maroon
213	UT-Juab	Keystone Ridge & Mammoth	Unknown	Small	?	?
117	UT-Juab	Picture Rock (DOGM's Bullseye #1)	Fillmore FO	Small	?	Rhyolite-Light brown-Red
176	UT-Juab	Rapunzel	Unknown	Small	?	Gemstones
196	UT-Millard	3 Guys Rock and Gem #1	Unknown	Medium	?	Volcanic
163	UT-Millard	B & W #1 claims	Fillmore FO	Small	?	Limestone-Black-White
195	UT-Millard	Ebony and Ivory #1	Fillmore FO	Small	?	Limestone-Black-White
33	UT-Millard	Feller zebra marble (DOGM's Black Hills)	Fillmore FO	Small	Notch Peak Form. (Є)	Marble-Black-White
204	UT-Millard	Levin Stone	Unknown	Small	Marjum Form. (Є)	Shale
34	UT-Millard	Marjum Pass community pit	Fillmore FO	Small-Material site	Marjum Form. (Є)	Shale-Gray
183	UT-Millard	ML 43854 & ML 982	State of Utah lease	Medium	?	Limestone
35	UT-Millard	Multi-colored Green Nos. 1-5/Pitchforth Springs	Fillmore FO	Small	Inkom Form. (pЄ)	Argillite-Reddish brown
119	UT-Millard	Pretty in Pink	Fillmore FO	Small	?	Limestone-White-Red
36	UT-Millard	Red Lace common use	Fillmore FO	Small-Material site	Late Tertiary andesite-trachyte-latite flows (T2af unit)	Boulders-Reddish brown
37	UT-Millard	Rich Gulch-Black Rock crusher facility	Fillmore FO	Medium	Marjum Form. (Є)	Limestone-Dark gray
205	UT-Millard	Rocanville/Wing JV Marjum	Fillmore FO	Medium	Marjum Form. (Є)	Sandstone-Reddish brown
38	UT-Millard	Rocanville/Wing JV pit 1 (Tejon)	Fillmore FO	Medium	Weeks Form. (Є)	Limestone-Reddish brown
39	UT-Millard	Rocanville/Wing JV pit 2 (Tejon)	Fillmore FO	Large	Weeks Form. (Є)	Limestone-Light red
40	UT-Millard	Rocanville/Wing JV pit 3 (Tejon)	Fillmore FO	Large	Weeks Form. (Є)	Limestone-Medium gray
41	UT-Millard	Rocanville/Wing JV pit 4 (Tejon)	Fillmore FO	Large	Weeks Form. (Є)	Limestone-Light greenish gray
206	UT-Millard	Ruby Red - Wheeler #3	Unknown	Small	?	Limestone-Grayish red
42	UT-Millard	Spectrum quarry	Fillmore FO	Medium	Marjum Form. (Є)	Shale-Gray
43	UT-Millard	Spectrum-North pit	Fillmore FO	Small	Marjum Form. (Є)	Shale-Gray
190	UT-Millard	Travertine Cove #2, 3, 4	Unknown	Small	?	Limestone
185	UT-Millard	Wah Wah Red	Fillmore FO	Small	?	?
44	UT-Millard	White Tiger	Fillmore FO	Small-Material site	Notch Peak Form. (Є)	Marble-White-Black

Figure 4. *Rocanville/Wing flagstone quarry in Fillmore Field Office area. The Rocanville/Wing quarries are located in North Canyon, T. 18 S., R.13 W., section 30, Millard County, Fillmore FO.* ***Top:*** *Shows pallets of reddish brown sandy siltstone quarried for landscape use.* ***Bottom:*** *View of quarry containing silty limestone used for landscape rock. Hand labor is used to split, sort, and select rock for loading. A loader is used to move finished pallets and remove waste after removing the rock product. Courtesy of Rocanville Stone.*

Table 9. *List of sites in the Cedar City BLM Field Office area.*

ID No	State-County	Name	Surface Ownership	Size-Type	Geologic Unit	Rock-Color
175	UT-Beaver	Carol mine	Unknown	Small	?	Gemstones
187	UT-Beaver	Courgraph	State of Utah	Medium-lease	?	Limestone
124	UT-Beaver	Hiltop	Cedar City FO	Small	?	Quartzite-White-Orange
171	UT-Beaver	Indian Queen	Unknown	Large	?	Marble-White
128	UT-Beaver	Picasso Marble Sliver #3-4	Cedar City FO	Large	?	Marble-Light gray
123	UT-Beaver	Red Beryl quarry (aka Ruby Violet)	Cedar City FO	Large	Steamboat Mountains rhyolite (20 mybp)	Rhyolite-White; gemstone
212	UT-Beaver	Southern White/Mountain Rose	Unknown	Small	?	Marble
126	UT-Beaver	Star Range Dolomite	Cedar City FO	Small	?	Dolomite-White
127	UT-Beaver	White Elephant	Cedar City FO	Small	?	Dolomite-White
122	UT-Iron	Bright quarry	Cedar City FO	Large-Material site	?	Rhyolite-Reddish brown
125	UT-Iron	Rhyolite (aka Color Country Rock)	Cedar City FO	Small	?	Rhyolite-Reddish brown
121	UT-Iron	RMS No. 1 Mtn. Spring Peak	Cedar City FO	Small	?	Rhyolite-Red

mybp = million years before present

Figure 5. *View of two quarry operations in Cedar City Field Office area.* ***Top:*** *The Picasso Marble Sliver 3-4 quarry is located in T. 29 S., R. 9 W., sections 17 and 20, Beaver County. Selected product is mined from a 3-4 ft thick silicified limestone ledge (dark gray colored unit between arrows) and sold on a specimen basis. It is mainly for artistic and lapidary purpose.* ***Bottom:*** *Bright quarry is located in Iron County in T. 35 S., R. 17 W., sections 21, 22, 25, 26, 27, and 28. Rhyolite rock is blasted and loaded by hydraulic excavator. Products include landscape boulders or aggregate crushed at screening plant at the site for use as landscaping aggregate. Photos courtesy of Bright and Picasso Marble quarries.*

Table 10. *List of sites in the Richfield BLM Field Office area.*

ID No	State-County	Name	Surface Ownership	Size-Type	Geologic Unit	Rock-Color
215	UT-Piute	Kingston Canyon Rock	Unknown	Small	?	Rhyolite
191	UT-Sanpete	B & C Limestone	State of Utah lease	Medium	?	Limestone
224	UT-Sanpete	Bryce Haas 1	State of Utah lease	Large	Green River Formation (Eoc.)	Sandstone-Light brown
225	UT-Sanpete	Bryce Haas 2	State of Utah lease	Large	Green River Formation (Eoc.)	Sandstone-Light brown
140	UT-Sanpete	Cream Time (DOGM's Mayfield)	State of Utah lease/Private	Large	Green River Formation (Eoc.)	Sandstone-Light brown
197	UT-Sanpete	Cream Time (Young/Bryce Haas)	State of Utah lease	Medium	Green River Formation (Eoc.)	Limestone-Light brown
141	UT-Sanpete	Day quarry (DOGM's Temple Strike)	State of Utah lease	Small	Green River Formation (Eoc.)	Limestone-Light brown
173	UT-Sanpete	Glen Goff property	Unknown	Small	Green River Formation (Eoc.)	Limestone
218	UT-Sanpete	Haas Limestone – Gunnison	Unknown	Small	?	Limestone
159	UT-Sanpete	Honey Onyx	State of Utah lease	Small	?	Limestone
221	UT-Sanpete	Lanny Jensen	State of Utah lease	Medium	Green River Formation (Eoc.)	Limestone
162	UT-Sanpete	Nine Mile (Bown)	State of Utah lease	Medium	Green River Formation (Eoc.)	Limestone
143	UT-Sevier	KSC #1 - Kanosh Stone Co.	Richfield FO	Small	Bullion Canyon Volcanics (Olig.)	Rhyolite-Grayish pink
144	UT-Sevier	KSC #2 - Kanosh Stone Co. (DOGM's UTU 79911)	Richfield FO	Small-Material site	Bullion Canyon Volcanics (Olig.)	Sandstone-Grayish pink
142	UT-Sevier	Nielsen quarry	Richfield FO	Medium	Joe Lott Tuff Member of Mt. Belknap Volcanics (Mio.)	Volcanic-Medium gray
165	UT-Sevier	Wonder #2	Richfield FO	Medium	?	Sandstone -Light brown
148	UT-Wayne	American Stone quarry (DOGM's Torrey)	Richfield FO	Medium	Moenkopi Formation	Sandstone-Reddish brown
146	UT-Wayne	Capitol Reef community pit	Richfield FO	Small-Material site	Moenkopi Formation	Sandstone-Light brown
219	UT-Wayne	Jon Young quarry (ML48973)	State of Utah lease	Small	Moenkopi Formation	Sandstone
147	UT-Wayne	Quality Stone	Richfield FO	Large-Material site	Moenkopi Formation	Sandstone-Reddish brown
198	UT-Wayne	Torrey Buff	State of Utah lease	Medium	Moenkopi Formation	Sandstone-Reddish brown

Figure 6. *Rock quarry operations in the area of Richfield Field Office area.* ***Top:*** *Cream Time quarry (140) operated on a State of Utah mineral lease near Mayfield, Utah, in T. 20 S., R. 2 E., section 17 SW1/4SW1/4, Sanpete County, Utah (known as Mayfield operation by State of Utah). Decorative flagstone is mined from a 3-6 ft-thick bed located at a depth of 10 ft (arrows) from the Eocene Green River Formation.* ***Bottom:*** *Quality Stone quarry (147) operated on a BLM material site near Grover located 5 miles southeast of Torrey in Utah, T. 29 S., R. 5 E., section 24, of Wayne County, Utah. The company mines large blocks measuring up to 5 ft x 5 ft x 5 ft from the Torrey Member of the Moenkopi Formation. The blocks are then cut to specific dimensions at the company's rock saw processing plant. Black powder burns created during blasting are visible in the photo along parts of the length of drill holes. The large blocks are removed from a 15-ft-thick sandstone ledge. Photos are courtesy of Bown Building Stone and Quality Stone.*

Table 11. *List of sites in the St. George BLM Field Office area.*

ID No	State-County	Name	Surface Ownership	Size-Type	Geologic Unit	Rock-Color
167	UT-Washington	Allen claims	Unknown	Small	Humbug Form.	Sandstone-Light brown
154	UT-Washington	Black Ridge #1	St George FO	Medium	Chinle Form., Shinarump Cgl. Mbr.	Sandstone
168	UT-Washington	Cobble/Sandstone (ML 47950)	State of Utah lease	Large	?	Sandstone
152	UT-Washington	Dolomite Stone #1	St George FO	Small-Material site	Callville Limestone (Penn.)	Dolomite-White
150	UT-Washington	Fire Pit #1-4	St George FO	Small	Navajo Sandstone	Sandstone-Reddish brown
158	UT-Washington	Harrisburg-Picture Spring 1, 2	St George FO	Medium	Chinle Form., Shinarump Cgl. Mbr.	Sandstone-Light brown
153	UT-Washington	Liesegang #9 (Butcher Knife)	St George FO	Medium-Material site	Callville Limestone (Penn.)	Sandstone-Light brown
155	UT-Washington	Limestone Mesa (Desert Bronze)	St George FO	Medium-Material site	Moenkopi Form., Virgin Ls. Mbr.	Limestone-Pinkish brown
164	UT-Washington	Little Creek Picture Sandstone	Unknown	Large	?	Sandstone
216	UT-Washington	Michaud #1-#4	Private/ St George FO	Small	?	Sandstone
203	UT-Washington	ML 48572-MP	State of Utah lease	Medium	?	?
214	UT-Washington	R & W project	Unknown	Small	?	?
208	UT-Washington	Red Sandstone	Unknown	Medium	?	Sandstone
149	UT-Washington	Sandstone Mountain	St George FO	Small	Navajo Sandstone	Sandstone-Light reddish brown
151	UT-Washington	Snow White	St George FO	Medium	Callville Limestone (Penn.)	Marble-White
156	UT-Washington	Virgin Community Pit	St George FO	Medium-Material site	Moenkopi Form., Virgin Ls. Mbr.	Limestone-Pinkish brown
157	UT-Washington	Windy #3	St George FO	Medium	Chinle Form., Shinarump Cgl. Mbr.	Sandstone-Light brown

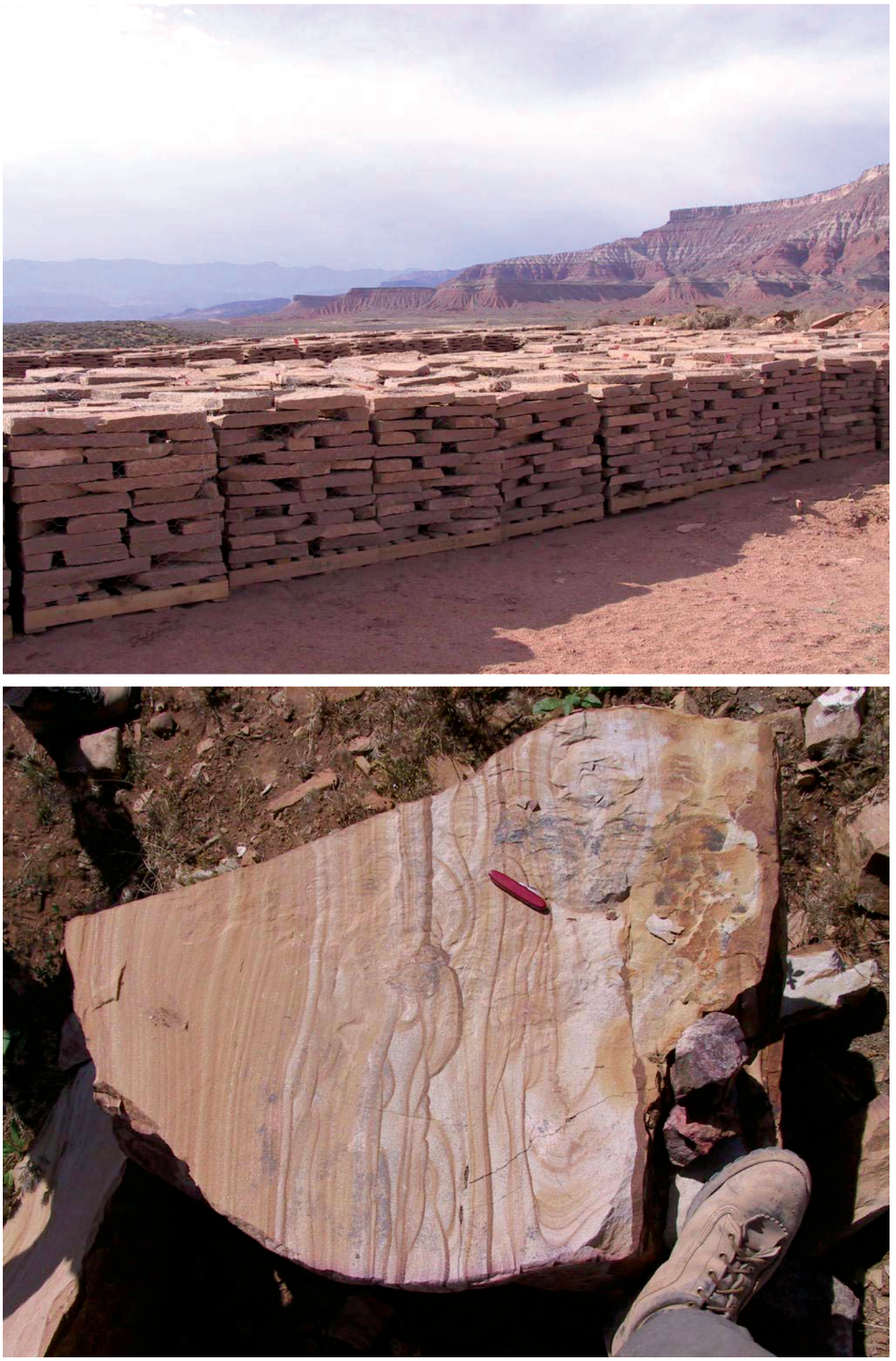

Figure 7. *Stone products from the St. George BLM Field Office area.* ***Top:*** *The Limestone Mesa material site (155) is developed in the Virgin Limestone Member of the Moenkopi Formation and located in T. 41 S., R. 12 W., section 29 W1/2SE1/4 of Washington County, Utah. Sandstone is loosened and then removed with a hydraulic excavator and then split and stacked by hand on pallets for landscape use.* ***Bottom:*** *Rock from the Windy #2 pit (157) is developed in the Shinarump Cgl. Member of the Chinle Formation and located in T. 41 S., R.18 W., section 13 S1/2 of Washington County. The distinct wavy liesegang colored banding pattern is an attractive feature. Among products made from this stone are various drink coasters named "Thirstystone" and a wine rack created by removing several 5-in diameter drilled cores and set on a sawed flat base. The drink coasters are most likely the uniform sawed slices from the drill cores.*

Table 12. *List of sites in the Vernal BLM Field Office area.*

ID No	State-County	Name	Surface Ownership	Size-Type	Geologic Unit	Rock-Color
54	UT-Duchesne	Cory Robison quarry	Vernal FO	Medium-Material site	Green River Formation (Eoc.)	Sandstone-Buff
55	UT-Duchesne	Cory Robison quarry	Vernal FO	Small	Green River Formation (Eoc.)	Sandstone-Buff
57	UT-Duchesne	Reese Jenson	Vernal FO	Small	Green River Formation (Eoc.)	Sandstone-Light brown
184	UT-Duchesne	Strawberry River	Unknown	Large	?	?
63	UT-Duchesne	United Stone (Abblecio Jiron #3)	State of Utah lease	Medium	Green River Formation (Eoc.)	Sandstone-Light brown
220	UT-Duchesne	United Stone (ML 48322)	State of Utah lease	Medium	Green River Formation (Eoc.)	Sandstone-Light brown
53	UT-Uintah	Chew Rock quarry (Split Mountain)	Vernal FO	Large	Chinle Form., Shinarump Cgl. Mbr.	Sandstone-Light brown
56	UT-Uintah	Hechtle surface mine (DOGM's UTU 076177)	Vernal FO	Small	Green River Formation (Eoc.)	Sandstone-Light brown
222	UT-Uintah	Ralph Simpson	State of Utah lease	Small	?	?
223	UT-Uintah	Reese Jenson	State of Utah lease	Medium	Green River Formation (Eoc.)	Sandstone
58	UT-Uintah	Reese Jenson-Fairbanks-area 1	Vernal FO	Small	Upper Green River Form. (Eoc.) - Parachute Creek Member	Sandstone-Light brown
59	UT-Uintah	Reese Jenson-Fairbank-area 2	Vernal FO	Small	Upper Green River Form. (Eoc.) - Parachute Creek Member	Sandstone-Light brown
61	UT-Uintah	Seep Ridge common use	Vernal FO	Small-Material site	Green River Formation (Eoc.)	Sandstone-Light brown
62	UT-Uintah	United Stone	State of Utah lease	Small	Green River Formation (Eoc.)	Sandstone-Light brown
64	UT-Uintah	Unknown	Vernal FO	Small	Green River Formation (Eoc.)	Sandstone-Light brown

Figure 8. *Stone extraction operations in Vernal BLM Field Office area.* ***Top:*** *Chew rock quarry (53) located on mining claims on Blue Mountain (aka Split Mountain), Uintah County in T. 5 S., R. 25E., sections 9 cW1/2 and 8 cE1/2 produces landscape and specialty dimension stone products (copings, mantles, signs) from the Shinarump Conglomerate Member of the Chinle Formation. Owner Alan Chew stands in small excavation containing thin-bedded reddish brown sandstone. Photo courtesy of Chew Rock Co.* ***Bottom:*** *Hechtle material sale UTU 076177 (56) located in T. 13 S., R. 21E., sections 17 SW1/4, 19 NE1/4, and 20 NW1/4 of Uintah County, Utah. Picture shows landscape sandstone (blocks) to be collected from the upper Green River Formation at the surface prior to hand collection. Only non-mechanized, surface collection operations are allowed.*

Table 13. *List of sites in the Kanab and Arizona Strip BLM Field Office areas.*

ID No	State-County	Name	Surface Ownership	Size-Type	Geologic Unit	Rock-Color
76	UT-Garfield	Boundary quarry community pit	Kanab FO	Small-Material site	Bear Valley Formation (Tertiary)	Sandstone-Medium green
82	UT-Garfield	Red Canyon basalt community pit	Kanab FO	Large-Material site	Basaltic andesite (Recent)	Boulders-Black
77	AZ-Mohave	Bitter Seep quarry community pit	St George FO-Ariz. Strip	Small-Material site	Moenkopi Formation	Sandstone-Reddish brown
80	UT-Kane	Alton #1 aggregate pit	Kanab FO	Large-Material site	Clinker and burned shale of Dakota Ss.	Clinker-Orange brown
174	UT-Kane	Bald Knoll	Unknown	Large	?	Shale-Orange brown
78	UT-Kane	Moenkopi Moca pit/plant	State of Utah lease	Large	Moenkopi Formation	Sandstone-Reddish brown
79	UT-Kane	Shinarump quarry community pit	Kanab FO	Small-Material site	Chinle Form., Shinarump Cgl. Mbr.	Boulders-Grayish pink
81	UT-Kane	Sink Valley community pit	Kanab FO	Large-Material site	Clinker and burned shale, Alton coal (Dakota Ss)	Clinker-Orange brown

Figure 9. *Examples of rock quarry operations in Kanab Field Office area.* ***Top right:*** *Moenkopi Moca pit (78) showing sandstone ledge approximately 10-ft thick from which large blocks are mined for dimension stone in T. 43 S., R. 4 W., section 32 NW1/4SE1/4 of Kane County, Utah. As one of many products taken from this quarry, the curbstone shown is blasted along a line of closely-spaced drill holes, then sawed into blocks and then shaped to specific dimensions by hand chiseling (**bottom right**). Photos courtesy of Hansen Stone.* ***Left:*** *Large pit operation at Boundary quarry material site (76), T. 33 S., R. 5 W., section 18 SW1/4SW1/4 Garfield County, Utah, located 8 mi north and 2 mi north of Panguitch, Utah. The material is light green fluvio-volcanic sandstone.*

quarry (79) in the Chinle Formation are all in Kane County. The scoria and orange shale (also called clinker or burned shale) result from baking of rock upon burning of coal beds of the Alton coal field, Utah. Only the Moenkopi Moca pit and plant (78) were operating in 2004 (figure 9).

Monticello BLM Field Office area, Utah

Five quarries are located within the boundaries of the Monticello FO area in San Juan County. Only the Bacon Rock quarry (75) was examined (table 14). The Bacon Rock (75), Picture Rock (186), and Cloudy Moon (207) quarries are each developed in the Dakota Sandstone (figure 10) while the Moenkopi Hite (169) is developed in the Moenkopi Formation.

Moab and Price BLM Field Office areas, Utah

Six quarries are present within the Moab and Price FO areas; however none of these quarry sites were examined (table 15).

Challis, Idaho Falls, and Pocatello BLM Field Office areas, Idaho

Six sites were examined in the Challis, Idaho Falls, and Pocatello BLM FO areas and Targhee NF (plate 3). Two rock yards (table 4) located in Idaho Falls were visited and samples of inventory photographed. The Three Rivers Stone quarry (ID No 9) (figure 11 bottom) produces attractive, durable, and hard silty sandstone from the Ordovician Clayton Mine Slate. The Three Rivers Stone quarry is the largest mining operation visited during 2004 (table 16). The Rock Works quarry and rock yard (8) recovers a hornblende granodiorite gneiss and quartzite flagstone from the Ordovician Ramshorn Slate. The Bear Lake community pit (134) has produced a small volume of friable sandstone from the Nugget Sandstone. The Hells Half Acre community pit (136) is a 30-square mile area for surface collection located west of City of Blackfoot, Idaho in an extensive Recent basalt flow field. At the Maad Mountain common use area (135) (figure 11, upper), a platy Tertiary rhyolite named Desert Antique is collected from surface talus piles and closely resembles the Rodriguez platy rhyolite in the Burley FO area. The Tincup mine (138) is a small, three-man operation located on three placer claims and two mill site claims. A light gray, vitreous, brittle quartzite Precambrian flagstone of Quartzite of Tin Cup Mountain is mined from three small quarries in the Targhee NF northwest of Island Park, Idaho. Tincup also operates a wholesale yard in Thornton, Idaho, about 50 mi south of the claims.

Kemmerer BLM Field Office area, Wyoming

Three quarries and two rock yards were examined within the Kemmerer Field Office area, Lincoln County, Wyoming. All quarries located on BLM land (table 17) were visited. Cumberland Gap Hearth Stone (130) operation and Oyster Ridge community pit (129) are developed in the Oyster Ridge Sandstone Member of the Cretaceous Frontier Formation. Wyoming Stone (133) removes loose stone from talus piles of the Jurassic Nugget Sandstone west of Kemmerer. The Oyster Ridge and Wyoming Stone operation is limited to non-mechanized surface collection of stone (figure 12). Each quarry was in operation at time of visit.

Okanogan-Colville National Forest area, Washington

Ten quarries and one rock yard in and near the Okanogan-Colville NFs in Okanogan, Ferry, and Pend Oreille Counties, Washington, were examined during 2004 (table 18) (pl 3). The Bangs Mountain (65), Black Star (66), and Columbia Quartzite (69) quarries are hosted by Paleozoic rocks associated with the Kettle Range gneiss dome. The Bead Lake (67), Cougar Mountain (72), FS RD 132-Flatrock (73), and Unknown Section 9 (74) quarries are hosted by strata of Mesoproterozoic Prichard Formation (figure 13). The Lloyd Logging rip rap (70) and Tollefson rip rap (71) quarries are developed in the Tertiary intrusive rocks of the eastern Cascade Mountains.

Kootenai National Forest area, Montana

Ten quarries and three rock yards are within or near the Kootenai NF in Sanders and Lincoln Counties of northwestern Montana (plate 3). Eight of the ten quarries were examined (table 19). Each of the quarries is developed in the Mesoproterozoic Prichard Formation, the lowermost formation of the Belt Supergroup (figure 14). The Prichard Formation is exploited at each of the Kavalla Ridge (22-24) quarry on Plum Creek Timber lands, B & M Stone's Kavalla material sale (20) on the Kootenai NF, and a private quarry (25) at Hot Springs, Montana. Four other private quarries (26, 30-32) were operating in the Prichard Formation in 2004 but were not visited. The Kavalla Ride State of Montana quarry (21) was inactive at time visited.

Table 14. *List of sites in the Monticello BLM Field Office area.*

ID No	State-County	Name	Surface Ownership	Size-Type	Geologic Unit	Rock-Color
75	UT-San Juan	Bacon rock quarry	Monticello FO	Large	Dakota Sandstone	Sandstone-Light brown
207	UT-San Juan	Cloudy Moon quarry	State of Utah lease	Small	Dakota Sandstone	Sandstone
211	UT-San Juan	Little Indian Mine	State of Utah lease	Medium	?	Sandstone
169	UT-San Juan	Moenkopi Hite quarry	State of Utah lease	Small	Moenkopi Formation	Sandstone-Reddish brown
186	UT-San Juan	Picture Rock/San Juan Rainbow #1	Unknown	Medium	Dakota Sandstone	Sandstone

Figure 10. *Reclaimed Bacon Rock quarry, Monticello Field Office area. The Bacon Rock (75) is located 20 mi southeast of Blanding in T. 38 S., R. 23 E., section 30 NE1/4SE1/4, San Juan County, Utah. The Cloudy Moon quarry (207) developed on the edge of the resistant sandstone ridge on a State of Utah lease, lies about two miles in the distance to the north. (out of view to right of picture).*

Table 15. *List of sites in the Moab and Price BLM Field Office areas.*

ID No	State-County	Name	Surface Ownership	Size-Type	Geologic Unit	Rock-Color
182	UT-Carbon	Italian Tan	Unknown	Small	?	Sandstone
180	UT-Carbon	Martin-Brown/Wilford #2	Price FO	Medium	?	Sandstone
178	UT-Emery	Red Chief	State of Utah lease	Small	?	Sandstone-Red
179	UT-Emery	Snow White	Unknown	Medium	?	Sandstone
217	UT-Grand	Lilim Claims	Moab FO	Small	?	Limestone
170	UT-Grand	Mystery - ML 45848	Unknown	Small	?	Gemstones

Table 16. *List of sites in the Challis, Idaho Falls, and Pocatello BLM Field Office areas, and Targhee National Forest.*

ID No	State-County	Name	Surface Ownership	Size-Type	Geologic Unit	Rock-Color
134	ID-Bear Lake	Bear Lake community pit	Pocatello FO	Small-Material site	Nugget Sandstone	Sandstone-Orange-White
136	ID-Bingham	Hells Half Acre community pit	Idaho Falls FO	Small-Material site	Recent basalt flow	Basalt-Black
135	ID-Clark	Maad Mountain common use area	Idaho Falls FO	Medium-Material site	Rhyolite Tuff	Rhyolite-Gray
138	ID-Clark	Tin Cup Mine	USDA, Targhee NF	Medium	Quartzite (p€) of Tin Cup Mtn.	Quartzite-Light gray
8	ID-Custer	Rock Works	Challis FO	Medium	Ramshorn Slate (O)	Granitic; Slate-Dark gray
9	ID-Custer	Three Rivers Stone	Challis FO	Large	Clayton Mine slate (O)	Argillite-Brown

Figure 11. *Quarry operations in Idaho Falls and Challis Field Office areas.* ***Top:*** *Desert Varnish stone at Maad Mountain common use area (135), T.10N., R.33E., section 7 SE1/4, Clark County, Idaho. Note the vehicle tracks trend upslope to reach across talus. The area of talus accumulation covers a two-square mile area where only surface collection is allowed.* ***Bottom:*** *L & W Stone' Three Rivers stone quarry (9) located 18 mi south of Challis, Idaho, in T. 11 N., R.18 E., section 22, Custer County, Idaho. This is the largest stone operation visited, and the operator anticipated producing 36,000 tons of palletted quartzite flagstone in 2004. The excavator moves rock to laborers' reach from a 12-ft-high bench after the bench has been loosened with a weak explosive blast. Forty-seven laborers then split, sort and stack flagstone by hand on pallets. Each laborer averages 22.5 tons of split flagstone per week. A loader and four, 40-ton haul trucks remove waste material to expedite hand access to the flagstone. Photo courtesy of L & W Stone.*

Table 17. *List of sites in the Kemmerer BLM Field Office area.*

ID No	State-County	Name	Surface Ownership	Size-Type	Geologic Unit	Rock-Color
130	WY-Lincoln	Cumberland Gap Hearth Stone	Kemmerer FO	Large	Frontier Fm., 200 ft below Oyster Ridge Ls Mbr.	Sandstone-Light brown
129	WY-Lincoln	Oyster Ridge community pit	Kemmerer FO	Small-Material site	Frontier Fm. Oyster Ridge Ls Mbr.	Sandstone-Light brown
133	WY-Lincoln	Wyoming Stone	Kemmerer FO	Medium-Material site	Nugget Sandstone	Sandstone-Medium brown

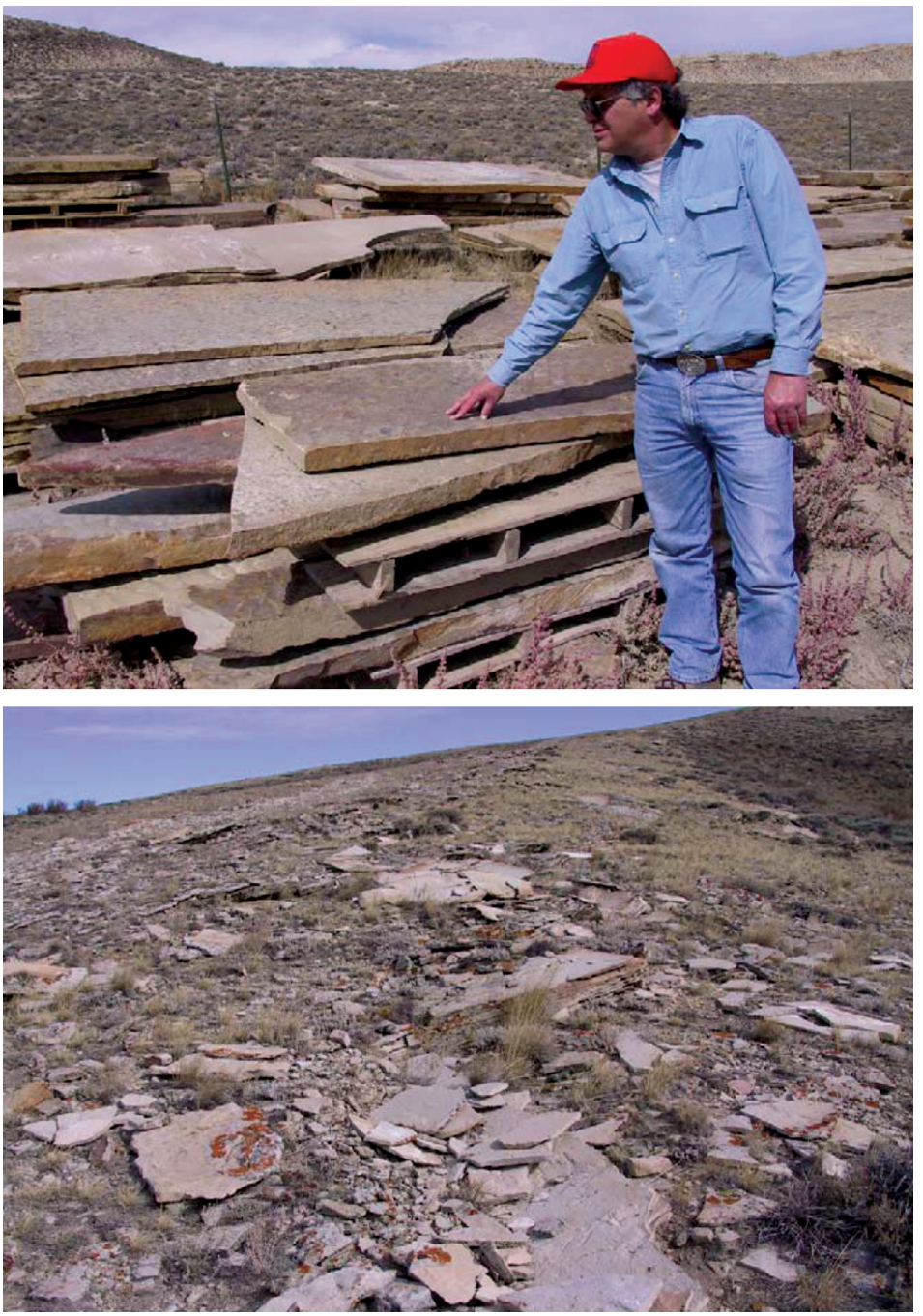

Figure 12. *Rock quarries in Kemmerer Field Office area.* ***Top:*** *Large sheets of sandstone product available at Cumberland Gap Hearth Stone (130) yard south of Kemmerer, Wyoming T.19 N., R. 116 W., section 20, Lincoln County, Wyoming, examined by geologist Gary McNaughton. Stone comes from Oyster Ridge Sandstone Member of Cretaceous Frontier Formation. Photo courtesy of Cumberland Gap Hearth Stone.* ***Bottom:*** *View of stone of Oyster Ridge Sandstone Member of Frontier Formation at Oyster Ridge community pit area (129), T.21 N, R.116 W., section 25, 1 mi. east of Kemmerer, Lincoln County, Wyoming.*

Table 18. *List of sites in the Okanogan-Colville National Forests.*

ID No	State-County	Name	Surface Ownership	Size-Type	Geologic Unit	Rock-Color
65	WA-Ferry	Bangs Mountain	Okanogan NF	Small-Material site	Kettle Range gneiss dome	Quartzite-Light greenish gray
66	WA-Ferry	Black Star	Okanogan NF	Small	Kettle Range gneiss dome	Amphibolite-Black
68	WA-Ferry	Columbia Quartzite (pit 1 and yard)	Private	Small	Kettle Range gneiss dome	Quartzite-Light brown
69	WA-Ferry	Columbia Quartzite (pit 2)	Private	Small	Kettle Range gneiss dome	Quartzite-Light brown
70	WA-Okanogan	Lloyd Logging rip rap	Private	Small	Buck Mtn. Formation	Granitic-Greenish gray
71	WA-Okanogan	Tollefson rip rap	Private	Small	Okanogan gneiss dome	Granitic-Greenish gray
67	WA-Pend Oreille	Bead Lake quarry	Private	Large	Prichard Form. (p€)	Quartzite-Medium gray
72	WA-Pend Oreille	Cougar Mountain (section 8 unnamed)	Private	Medium	Prichard Form. (p€)	Shale-Medium gray
73	WA-Pend Oreille	FS Rd 132-Flatrock	Okanogan NF	Small	Prichard Form. (p€)	Shale-Medium gray
74	WA-Pend Oreille	Unknown Section 9	Okanogan NF	Small	Prichard Form. (p€)	Shale-Medium gray

Figure 13. *Rock quarries in Okanogan-Colville National Forests, Washington.* ***Top:*** *Bead Lake quarry (67) consists of private in-holdings within Colville NF and produced over 5,700 tons of slatey flagstone from the Mesoproterozoic Prichard Formation. Located in T. 32 N., R.45 E., section 5 SW1/4SE1/4, Pend Oreille County, and approximately 10 mi. north of Newport, Washington. Rod Lentz, Forest geologist, Okanogan NF stands in the middle of the active pit.* ***Bottom:*** *Columbia River Quartzite quarry (69) located in T. 36 N., R. 37 E., section 11, Ferry County, about two miles west of Kettle Falls, Washington. This private quarry produces small amounts of high quality durable quartzite flagstone for landscaping and quartzite boulders for artistic fountains. Rock comes from an unnamed Paleozoic unit located on the east side of Kettle Range gneiss dome in the footwall of the Kettle Range thrust fault. It closely resembles quartzite from Box Elder County, Utah. Photos courtesy of Bead Lake and Columbia Quartzite quarries.*

Table 19. *List of sites in the Kootenai National Forest area.*

ID No	State-County	Name	Surface Ownership	Size-Type	Geologic Unit	Rock-Color
22	MT-Lincoln	Kavalla Ridge--Robert Orr (pit 1)	Private	Medium	Prichard Form. (pЄ)	Argillite-Medium gray
23	MT-Lincoln	Kavalla Ridge--Robert Orr (pit 2)	Private	Medium	Prichard Form. (pЄ)	Argillite-Medium gray
24	MT-Lincoln	Kavalla Ridge--Robert Orr (pit 3)	Private	Medium	Prichard Form. (pЄ)	Argillite-Medium gray
20	MT-Lincoln	Kavalla--B&M Stone	Kootenai NF	Medium-Material site	Prichard Form. (pЄ)	Argillite-Gray
21	MT-Lincoln	Kavalla Ridge	State of Montana	Medium	Prichard Form. (pЄ)	Argillite-Gray
25	MT-Sanders	Hot Springs quarry	Private	Small	Revett (?) Form. (pЄ)	Quartzite-Brown
26	MT-Sanders	Hwys. 200 & 382 quarry, Flathead River	Private	Medium	Prichard Form. (pЄ)	Argillite-Gray
31	MT-Sanders	Unnamed quarry	Unknown	Small	Prichard Form. (pЄ)	Argillite
30	MT-Sanders	Unnamed quarry	Unknown	Small	Prichard Form. (pЄ)	Argillite-Gray
32	MT-Sanders	Unnamed quarry Hwy 382	Private	Small	Prichard Form. (pЄ)	Argillite-Gray

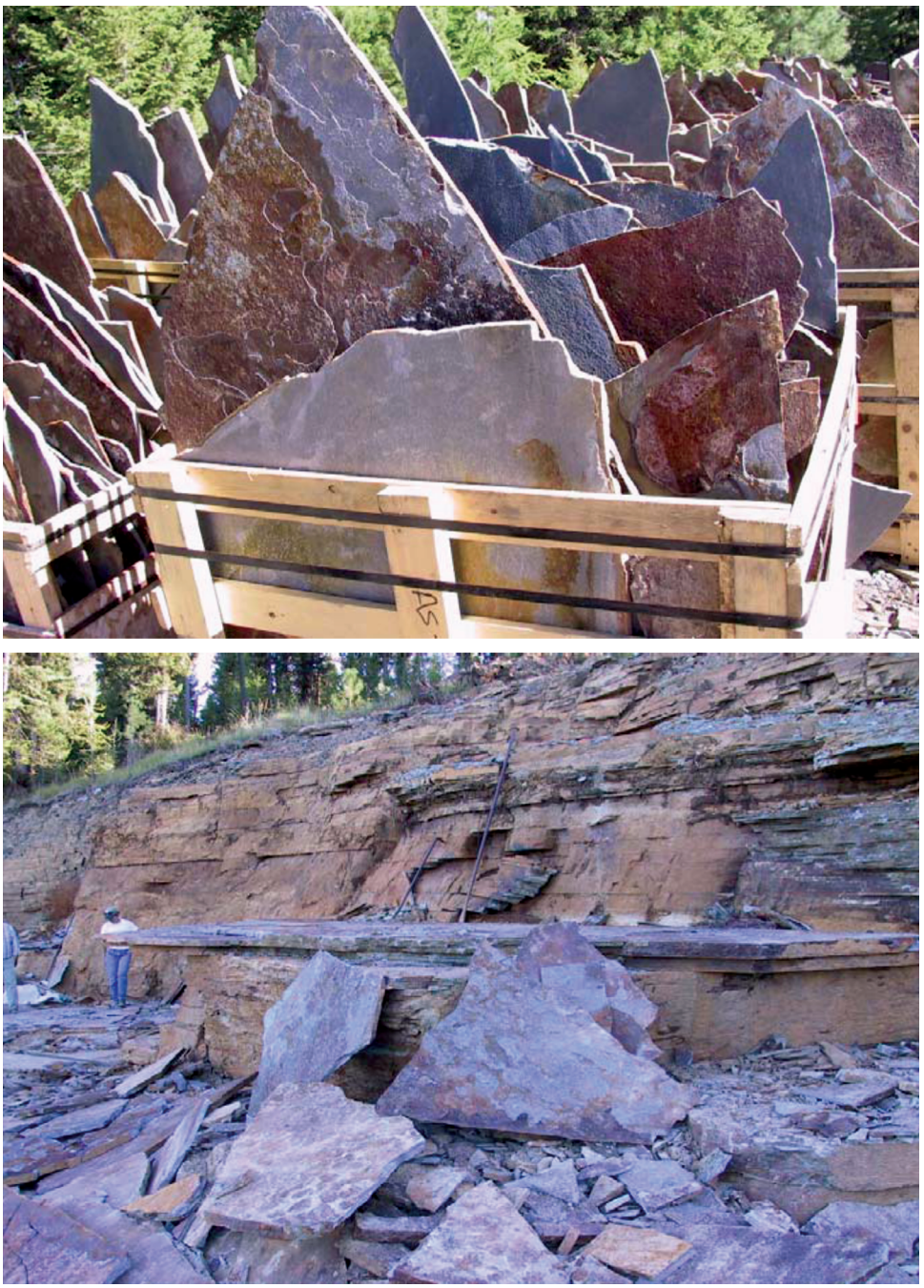

Figure 14. *Rock quarries in vicinity of Kootenai National Forest, Montana.* ***Top:*** *Palleted flagstone product consisting of quartzite and silty quartzite rock at B & M Stone's Kavalla material sale quarry (20), in the Kootenai NF of Lincoln County, Montana, T. 29 N., R. 27 W., section 20 NE1/4, is located 8 mi south and 21 mi east of Libby, Montana.* ***Bottom:*** *View of pit and quartzite flagstone quarried on Plum Creek Timber Co. (22-24) private in-holdings in the Kootenai National Forest at Kavalla-Plum Creek Timber, Lincoln County, Montana, in T. 29 N., R. 27 W., section 14 SW1/4SW1/4. Rock quarried is silty argillite from the Prichard Formation. Photos courtesy of Plum Creek Timber, and B & M Stone.*

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APPENDIX

1. Quarry Site Data Form used to record field data

SITE INFO Field Office _____ Date_____ Surface Mgmt.

(BLM,FS,_____)

Site Visit (Y, N) Photos (Y, N) Sampled (Y,N) Status--(Raw, Explored, Active, Inactive, Past Producer)

Mine name (BLM)_____BLM Case No. _____

Type_____

Claim name_____ (Comm. Pit, Material site, Common use)

Sub Terra Name _____No._____

DOGM Name _____No.

SITLA Name _____No._____

Surface Ownership—(State, Federal, Private) If private, owner name, addr.___ _____

Type of claim_____Map name_____

Is operating Plan available? (Y, N) Bond amount, $_____

Company Name1_____ (Claimant, operator, owner, lessor)

Address 1_____Tele. ( )

Company Name2_____(Claimant, operator, owner, lessor)

Address2_____Tele. ()

Person interviewed_____(Claimant, operator, owner, lessor)

Person interviewed_____(Claimant, operator, owner, lessor)

Location of operation_____

State_____ County_____ T_____ R_____ Sec-

Subdiv._____

GPS_____ _____Grid

GPS_____

Possible Common or Uncommon

variety_____

SOURCES OF DATA:

GEOLOGY:

TYPE MATERIAL MINED (rock description): ACRES:

SITE LAYOUT and CROSS-SECTION:

OPERATIONS

MINING METHOD:
OVERBURDEN (ft or %): WASTE (%):
MINE LIFE:
PRODUCTION RATE:
WORK SCHEDULE: HAUL DISTANCE TO YARD:
PROCESSING: ON-SITE: OFF-SITE:
PERSONNEL:

No.	Name	Rate	Burden	Work Schedule

BUILDINGS:

EQUIPMENT:

No.	Name	Size	Utilization-%	Cost, new

PRODUCTS

PRODUCTS MINED: (Is a price list available?)

Name	Description	Quantity

PRODUCT INVENTORY:

Name	Description	Quantity	Sales Price

TRANSPORTATION

Destinations/Mode	Distance	Product	Quantity	Cost

MARKET DESCRIPTION (Market area? Products sold? Market names? Uses? Volumes? Tons? Issues in market? Share of market? Demand factors? Competitors? Market strategy? Market niche? Strengths (internal)? What are your doing to overcome Weaknesses (internal)? What are Opportunities (external)? What are you doing to overcome Threats (external)? Promotion strategy?
Marketing method? Limiting factors (problems, barriers) in market?

COSTS

OPERATING COSTS:

Item name	Utilization (% or schedule)	Seasonal	Fuel & Lub.	Maintenance

CAPITAL COSTS:

Name	Size	Cost

ROYALTY or RENTAL, Amount: Royalty paid to:

UNUSUAL DEPOSIT CHARACTERISTICS:
CHARACTERISTICS THAT GIVE VALUE:
SUPPORTING DATA; REFERENCES:

2. Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (stone_sites.txt)

Stone_sites.txt (electronic version) is provided in “Appendix” folder on CD.

Stone_sites.txt is also appended in the table that follows. Table 3 explains the headings (table stucture) for this table.

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Alt_Name	Location_State	Surface_Mgmt	Case_Type	Visited	Photos	Sampled	Date_Visit	Status
1	Scrivanich - Sec. 3 lower quarry	--	ID	Burley FO	Claims	Yes	Yes	Yes	July 21 2004	Active
2	Scrivanich - Sec. 3 upper quarry	--	ID	Burley FO	Claims	Yes	Yes	Yes	July 21 2004	Active
3	Scrivanich-Rodriguez--sec. 10 lower quarry	--	ID	Burley FO	Claims	Yes	Yes	Yes	July 2 2004	Active
4	Scrivanich-Rodriguez--sec. 10 stop 1	--	ID	Burley FO	Claims	Yes	Yes	Yes	July 2 2004	Active
5	Scrivanich-Rodriguez--sec. 10 stop 2	--	ID	Burley FO	Claims	Yes	Yes	Yes	July 2 2004	Active
6	Scrivanich (yard)	--	ID	Burley FO	Claims	Yes	Yes	No	July 2 2004	Active
7	T. Rodriguez	--	ID	Burley FO	Material site	Yes	Yes	Yes	July 21 2004	Inactive
8	Rock Works	--	ID	Challis FO	Use site (Mill), Quarry	Yes	Yes	Yes	Sep. 7 2004	Active
9	Three Rivers Stone	--	ID	Challis FO	Claims	Yes	Yes	Yes	Sep. 7 2004	Active
10	Northern Stone--Granite quarry stop 1	--	ID	Patented claims	Private	Yes	Yes	Yes	Aug 3 2004	Active
11	Northern Stone--Granite quarry stop 2	--	ID	Patented claims	Private	Yes	Yes	Yes	Aug 3 2004	Active
12	Northern Stone--Middle Gold quarry	--	ID	Patented claims	Private	Yes	Yes	Yes	Aug 3 2004	Active
13	Northern Stone--Reds Middle quarry stop 1	--	ID	Patented claims	Private	Yes	Yes	Yes	Aug 3 2004	Active
14	Northern Stone--Reds Middle quarry stop 2	--	ID	Patented claims	Private	Yes	Yes	Yes	Aug 3 2004	Active
15	Northern Stone--Silver quarry	--	ID	Patented claims	Private	Yes	Yes	Yes	Aug 3 2004	Active
16	Northern Stone--South quarry	--	ID	Patented claims	Private	Yes	Yes	Yes	Aug 3 2004	Active

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Map_Name	Type_Site	Claim_Name	BLM_Case	SubTerra_Number	UT_DOGM_ID
1	Scrivanich - Sec. 3 lower quarry	Basin 7.5	Quarry, 1 of 3	--	--	i020003	--
2	Scrivanich - Sec. 3 upper quarry	Basin 7.5	Quarry, 1 of 3	--	--	i020003	--
3	Scrivanich-Rodriguez--sec. 10 lower quarry	Basin 7.5	Quarry, 1 of 3	--	--	i020003	--
4	Scrivanich-Rodriguez--sec. 10 stop 1	Basin 7.5	Quarry, 1 of 3	--	--	i020003	--
5	Scrivanich-Rodriguez--sec. 10 stop 2	Basin 7.5	Quarry, 1 of 3	--	--	i020003	--
6	Scrivanich (yard)	Basin 7.5	Yard	--	--	i020003	--
7	T. Rodriguez	Basin 7.5	Surface collection only	--	--	--	--
8	Rock Works	Challis FO	Yard	--	--	--	--
9	Three Rivers Stone	Challis FO	Quarry	--	IDI 029482	--	--
10	Northern Stone--Granite quarry stop 1	Lyman Pass 7.5	Quarry, 1 of 9	--	--	i020004	--
11	Northern Stone--Granite quarry stop 2	Lyman Pass 7.5	Quarry, 1 of 9	--	--	i020004	--
12	Northern Stone--Middle Gold quarry	Lyman Pass 7.5	Quarry, 1 of 9	--	--	i020004	--
13	Northern Stone--Reds Middle quarry stop 1	Lyman Pass 7.5	Quarry, 1 of 9	--	--	i020004	--
14	Northern Stone--Reds Middle quarry stop 2	Lyman Pass 7.5	Quarry, 1 of 9	--	--	i020004	--
15	Northern Stone--Silver quarry	Lyman Pass 7.5	Quarry, 1 of 9	--	--	i020004	--
16	Northern Stone--South quarry	Lyman Pass 7.5	Quarry, 1 of 9	--	--	i020004	--

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	UT_SITLA_ID	Data_Source	Operator_Name
1	Scrivanich - Sec. 3 lower quarry	--	Steve Flock, Sawtooth NF, Sarah, gen manager, Mitch, quarry mgr.; SubTerra (2004)	Scrivanich Stone
2	Scrivanich - Sec. 3 upper quarry	--	Steve Flock, Sawtooth NF, Sarah, gen manager, Mitch, quarry mgr.; SubTerra (2004)	Scrivanich Stone
3	Scrivanich-Rodriguez--sec. 10 lower quarry	--	Steve Flock, Sawtooth NF, Sarah, gen manager, Mitch, quarry mgr.; SubTerra (2004)	Scrivanich Stone
4	Scrivanich-Rodriguez--sec. 10 stop 1	--	Steve Flock, Sawtooth NF, Sarah, gen manager, Mitch, quarry mgr.; SubTerra (2004)	Scrivanich Stone
5	Scrivanich-Rodriguez--sec. 10 stop 2	--	Steve Flock, Sawtooth NF, Sarah, gen manager, Mitch, quarry mgr.; SubTerra (2004)	Scrivanich Stone
6	Scrivanich (yard)	--	Steve Flock, Sawtooth NF, Sarah, gen manager, Mitch, quarry mgr.; SubTerra (2004)	Scrivanich Stone
7	T. Rodriguez	--	Steve Flock, Sawtooth NF (2004)	Unknown
8	Rock Works	--	Kirk Hansen, owner	Rock Works
9	Three Rivers Stone	--	Steve Peterson, manager	L & W Stone
10	Northern Stone--Granite quarry stop 1	--	Gary Mullard, owner; Garth Greenwell, manager; SubTerra (2004)	Northern Stone Supply Co.
11	Northern Stone--Granite quarry stop 2	--	Gary Mullard, owner; Garth Greenwell, manager; SubTerra (2004)	Northern Stone Supply Co.
12	Northern Stone--Middle Gold quarry	--	Gary Mullard, owner; Garth Greenwell, manager; SubTerra (2004)	Northern Stone Supply Co.
13	Northern Stone--Reds Middle quarry stop 1	--	Gary Mullard, owner; Garth Greenwell, manager; SubTerra (2004)	Northern Stone Supply Co.
14	Northern Stone--Reds Middle quarry stop 2	--	Gary Mullard, owner; Garth Greenwell, manager; SubTerra (2004)	Northern Stone Supply Co.
15	Northern Stone--Silver quarry	--	Gary Mullard, owner; Garth Greenwell, manager; SubTerra (2004)	Northern Stone Supply Co.
16	Northern Stone--South quarry	--	Gary Mullard, owner; Garth Greenwell, manager; SubTerra (2004)	Northern Stone Supply Co.

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Operator_Address	Operator_State	Operator_Tele	Location_Descr
1	Scrivanich - Sec. 3 lower quarry	PO Box 27 Oakley, ID 83346	ID	208-862-3820	6 mi S of Oakley, ID
2	Scrivanich - Sec. 3 upper quarry	PO Box 27 Oakley, ID 83346	ID	208-862-3820	6 mi S of Oakley, ID
3	Scrivanich-Rodriguez--sec. 10 lower quarry	PO Box 27 Oakley, ID 83346	ID	208-862-3820	6 mi S of Oakley, ID
4	Scrivanich-Rodriguez--sec. 10 stop 1	PO Box 27 Oakley, ID 83346	ID	208-862-3820	6 mi S of Oakley, ID
5	Scrivanich-Rodriguez--sec. 10 stop 2	PO Box 27 Oakley, ID 83346	ID	208-862-3820	6 mi S of Oakley, ID
6	Scrivanich (yard)	PO Box 27 Oakley, ID 83346	ID	208-862-3820	6 mi S of Oakley, ID
7	T. Rodriguez	Unknown	ID	Unknown	10 mi S. of Oakley ID
8	Rock Works	Clayton, ID	ID	208-838-2383	10 mi SW of Challis on Hwy 75
9	Three Rivers Stone	Challis, ID	ID	208-838-2540	18 mi SW of Challis, ID on Hwy 75; mile marker 227
10	Northern Stone--Granite quarry stop 1	Box 249 Oakley, ID	ID	208-862-3353	8 mi S. of Oakley
11	Northern Stone--Granite quarry stop 2	Box 249 Oakley, ID	ID	208-862-3353	8 mi S. of Oakley
12	Northern Stone--Middle Gold quarry	Box 249 Oakley, ID	ID	208-862-3353	8 mi S. of Oakley
13	Northern Stone--Reds Middle quarry stop 1	Box 249 Oakley, ID	ID	208-862-3353	8 mi S. of Oakley
14	Northern Stone--Reds Middle quarry stop 2	Box 249 Oakley, ID	ID	208-862-3353	8 mi S. of Oakley
15	Northern Stone--Silver quarry	Box 249 Oakley, ID	ID	208-862-3353	8 mi S. of Oakley
16	Northern Stone--South quarry	Box 249 Oakley, ID	ID	208-862-3353	8 mi S. of Oakley

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Location_County	Tp	Rg	Sec&Sub	Lat_dd	Long_dd	UTM_E	UTM_N	UTM_Zone	Coll_Method
1	Scrivanich - Sec. 3 lower quarry	Cassia	15 S	22 E	3	42.1622	-113.8608	263656	4671531	12T	Recorded
2	Scrivanich - Sec. 3 upper quarry	Cassia	15 S	22 E	3	42.1624	-113.8576	263925	4671554	12T	Recorded
3	Scrivanich-Rodriguez--sec. 10 lower quarry	Cassia	15 S	22 E	10 se	42.1314	-113.8587	263717	4668112	12T	Recorded
4	Scrivanich-Rodriguez--sec. 10 stop 1	Cassia	15 S	22 E	10 se	42.1302	-113.8563	263906	4667961	12T	Recorded
5	Scrivanich-Rodriguez--sec. 10 stop 2	Cassia	15 S	22 E	10 se	42.1292	-113.8565	263896	4667857	12T	Recorded
6	Scrivanich (yard)	Cassia	15 S	22 E	10 se	42.1388	-113.8895	261001	4669031	12T	Recorded
7	T. Rodriguez	Cassia	14 S	21 E	15	42.1983	-113.9748	254373	4675869	12T	Recorded
8	Rock Works	Custer	12 N	14 E	19	44.3618	-114.2621	718172	4915702	11T	Recorded
9	Three Rivers Stone	Custer	11 N	18 E	22	44.2727	-114.3153	714255	4905657	11T	Recorded
10	Northern Stone--Granite quarry stop 1	Cassia	15 S	22 E	22	42.1047	-113.8607	263460	4665360	12T	Recorded
11	Northern Stone--Granite quarry stop 2	Cassia	15 S	22 E	22	42.1042	-113.8585	263639	4665298	12T	Recorded
12	Northern Stone--Middle Gold quarry	Cassia	15 S	22 E	15	42.1148	-113.8562	263876	4666491	12T	Recorded
13	Northern Stone--Reds Middle quarry stop 1	Cassia	15 S	22 E	22	42.1127	-113.8525	264170	4666217	12T	Recorded
14	Northern Stone--Reds Middle quarry stop 2	Cassia	15 S	22 E	15	42.1145	-113.8539	264060	4666434	12T	Recorded
15	Northern Stone--Silver quarry	Cassia	15 S	22 E	15	42.1163	-113.8563	263865	4666672	12T	Recorded
16	Northern Stone--South quarry	Cassia	15 S	22 E	22	42.1103	-113.8563	263839	4665598	12T	Recorded

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Color	Geology	Generalized_Rock_Unit
1	Scrivanich - Sec. 3 lower quarry	Light greenish white	Elba Quartzite (pC)	ElbaQtz_pC
2	Scrivanich - Sec. 3 upper quarry	Light greenish white	Elba Quartzite (pC)	ElbaQtz_pC
3	Scrivanich-Rodriguez--sec. 10 lower quarry	Light gray	Elba Quartzite (pC)	ElbaQtz_pC
4	Scrivanich-Rodriguez--sec. 10 stop 1	Light gray	Elba Quartzite (pC)	ElbaQtz_pC
5	Scrivanich-Rodriguez--sec. 10 stop 2	Light gray	Elba Quartzite (pC)	ElbaQtz_pC
6	Scrivanich (yard)	--	--	--
7	T. Rodriguez	Gray	Rhyolite tuff of Goose Creek (Miocene)	Rhyolite
8	Rock Works	Dark gray	Ramshorn Slate (Ordo.)	Ramshorn
9	Three Rivers Stone	Brown	Clayton Mine slate (Ordo.)	ClaytonSlate
10	Northern Stone--Granite quarry stop 1	Dark gray	Orthogneiss (Olig.)	Orthogneiss
11	Northern Stone--Granite quarry stop 2	Dark gray	Orthogneiss (Olig.)	Orthogneiss
12	Northern Stone--Middle Gold quarry	Light greenish gray	Elba Quartzite (pC)	ElbaQtz_pC
13	Northern Stone--Reds Middle quarry stop 1	Greenish gray	Elba Quartzite (pC)	ElbaQtz_pC
14	Northern Stone--Reds Middle quarry stop 2	Medium greenish gray	Elba Quartzite (pC)	ElbaQtz_pC
15	Northern Stone--Silver quarry	Light greenish gray	Elba Quartzite (pC)	ElbaQtz_pC
16	Northern Stone--South quarry	Light greenish gray	Elba Quartzite (pC)	ElbaQtz_pC

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Lithologic_Description	Generalized_Lithology
1	Scrivanich - Sec. 3 lower quarry	Quartzite, flagstone, slightly micaceous, very light greenish white and vitreous	Quartzite
2	Scrivanich - Sec. 3 upper quarry	Quartzite, flagstone, slightly micaceous, very light greenish white and vitreous	Quartzite
3	Scrivanich-Rodriguez--sec. 10 lower quarry	Quartzite, flagstone, micaceous, silvery gray or white and vitreous	Quartzite
4	Scrivanich-Rodriguez--sec. 10 stop 1	Quartzite, flagstone, slightly micaceous, silvery gray or white and vitreous	Quartzite
5	Scrivanich-Rodriguez--sec. 10 stop 2	Quartzite, flagstone, slightly micaceous, silvery gray or white and vitreous	Quartzite
6	Scrivanich (yard)	Photographs taken of all varieties of stone in inventory	--
7	T. Rodriguez	Rhyolite, flat blocks, platy, lichen coverings	Rhyolite tuff
8	Rock Works	Granodiorite, speckled, hornblende prominent, ("Ramshorn antique"); quartzite, thin-med bedded ("Ramshorn slate")	Granitic;Slate
9	Three Rivers Stone	Argillite, brown, mottled	Argillite
10	Northern Stone--Granite quarry stop 1	Granite gneiss, lineation along planes containing muscovite-biotite, trace red garnet	Orthogneiss
11	Northern Stone--Granite quarry stop 2	Granodiorite	Granitic
12	Northern Stone--Middle Gold quarry	Quartzite flagstone, very slightly greenish gray, minor micaceous along partings, very hard, durable	Quartzite
13	Northern Stone--Reds Middle quarry stop 1	Quartzite, flaggy, medium greenish gray, 2-3 percent muscovite and 2-3 percent chlorite in large patches promotes splitting along planes	Quartzite
14	Northern Stone--Reds Middle quarry stop 2	Quartzite, flaggy, medium greenish gray, 2-3 percent muscovite and 2-3 percent chlorite in large patches promotes splitting along planes	Quartzite
15	Northern Stone--Silver quarry	Quartzite flagstone, very slightly greenish gray, minor micaceous along partings, very hard, durable	Quartzite
16	Northern Stone--South quarry	Quartzite flagstone, very slightly greenish gray, minor micaceous along partings, very hard, durable	Quartzite

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Other_characteristics	Extraction_Fractures_Cleavability	Product_Dimension_Fractures_Cleavability
1	Scrivanich - Sec. 3 lower quarry	Hardness, durability; shiny due to mica flakes; variation in color of several products available; uses are for: patio, flooring, cut tile, entries, walks, water features, veneer; strengths are: color, specification (grading, consistency), presentation (neat stacking); weaknesses are: small pieces.	Favorable with respect to extraction	Favorable with respect to product dimensions.
2	Scrivanich - Sec. 3 upper quarry	Quartzite is hard and durable.	Favorable with respect to extraction	Favorable with respect to product dimensions.
3	Scrivanich-Rodriguez--sec. 10 lower quarry	Quartzite is hard and durable.	Favorable with respect to extraction	Favorable with respect to product dimensions.
4	Scrivanich-Rodriguez--sec. 10 stop 1	Quartzite is hard and durable.	Favorable with respect to extraction	Favorable with respect to product dimensions.
5	Scrivanich-Rodriguez--sec. 10 stop 2	Quartzite is hard and durable.	Favorable with respect to extraction	Favorable with respect to product dimensions.
6	Scrivanich (yard)	Quartzite is hard and durable.	--	--
7	T. Rodriguez	Platy shape; hard and durable	Not Applicable.	Not applicable
8	Rock Works	Slate parts easily; very durable and hard; slate has multi-coloration due to oxidation pattern, hardness, durability, and coloration	Favorable with respect to extraction	Favorable with respect to product dimensions.
9	Three Rivers Stone	Splits into slabs of 1 to 3 in thickness; hard and durable; Hardness, durability, coloration due to intricate patterns of oxidation	Favorable with respect to extraction	Favorable with respect to product dimensions.
10	Northern Stone--Granite quarry stop 1	Splits irregularly along micaceous planes into plates of rock; hard, durable	Favorable with respect to extraction	Unfavorable with respect to product dimensions
11	Northern Stone--Granite quarry stop 2	Splits irregularly into plates of rock; hard, durable	Favorable with respect to extraction	Unfavorable with respect to product dimensions
12	Northern Stone--Middle Gold quarry	Splits regularly along mica partings, very hard to brittle, durable; color	Favorable with respect to extraction	Favorable with respect to product dimensions.
13	Northern Stone--Reds Middle quarry stop 1	Splits regularly along mica partings, very hard to brittle, durable; color	Favorable with respect to extraction	Favorable with respect to product dimensions.
14	Northern Stone--Reds Middle quarry stop 2	Splits regularly along mica partings, very hard to brittle, durable; color	Favorable with respect to extraction	Favorable with respect to product dimensions.
15	Northern Stone--Silver quarry	Splits regularly along mica partings, very hard to brittle, durable; color	Favorable with respect to extraction	Favorable with respect to product dimensions.
16	Northern Stone--South quarry	Splits regularly along mica partings, very hard to brittle, durable; color	Favorable with respect to extraction	Favorable with respect to product dimensions.

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Influence_of_Texture	Uniform_Thickness	Lithology_Hardness_Durability	Rock_Quality_Suitability
1	Scrivanich - Sec. 3 lower quarry	Likely influence	Yes	Advantageous	Good quality flagstone is produced
2	Scrivanich - Sec. 3 upper quarry	No Influence	Yes	Advantageous	Good to excellent
3	Scrivanich-Rodriguez--sec. 10 lower quarry	Likely influence	Yes	Advantageous	Good quality flagstone is produced
4	Scrivanich-Rodriguez--sec. 10 stop 1	Likely influence	Yes	Advantageous	Good quality flagstone is produced
5	Scrivanich-Rodriguez--sec. 10 stop 2	Likely influence	Yes	Advantageous	Good quality flagstone is produced
6	Scrivanich (yard)	--	--	--	--
7	T. Rodriguez	No Influence	No	Moderately Advantageous	Fair to good quality
8	Rock Works	Likely influence	Yes	Advantageous	Fair to moderate quality; nature of foliated texture may be a limiting factor
9	Three Rivers Stone	Likely influence	Yes	Advantageous	Durable for landscape uses
10	Northern Stone--Granite quarry stop 1	Likely influence	No	Moderately Advantageous	Development of slabs, flagstone depends on degree of foliation in gneissic granite
11	Northern Stone--Granite quarry stop 2	Likely influence	No	Moderately Advantageous	Development of slabs, flagstone depends on degree of foliation in gneissic granite
12	Northern Stone--Middle Gold quarry	No Influence	Yes	Advantageous	Readily cleaves into hard, durable flagstone
13	Northern Stone--Reds Middle quarry stop 1	Likely influence	Yes	Advantageous	Good quality flagstone is produced
14	Northern Stone--Reds Middle quarry stop 2	Likely influence	Yes	Advantageous	Good quality flagstone is produced
15	Northern Stone--Silver quarry	Likely influence	Yes	Advantageous	Good quality flagstone is produced
16	Northern Stone--South quarry	Likely influence	Yes	Advantageous	Good quality flagstone is produced

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Size	Ease_of_Extraction	Extent_of_Deposit	Reserve_Limits_Overburden
1	Scrivanich - Sec. 3 lower quarry	Large	Moderately easy (extraction by hydraulic excavator)	Extended	Reserve large; overburden is small
2	Scrivanich - Sec. 3 upper quarry	Large	Moderately easy (extraction by ripping)	Extended	Extensive > 10 year reserve
3	Scrivanich-Rodriguez--sec. 10 lower quarry	Large	Moderately easy (extraction by hydraulic excavator)	Extended	Reserve large; overburden is small
4	Scrivanich-Rodriguez--sec. 10 stop 1	Large	Moderately easy (extraction by hydraulic excavator)	Extended	Reserve large; overburden is small
5	Scrivanich-Rodriguez--sec. 10 stop 2	Large	Moderately easy (extraction by hydraulic excavator)	Extended	Reserve large; overburden is small
6	Scrivanich (yard)	Yard-operations	--	--	--
7	T. Rodriguez	Small-Material site	Very easy (no mechanized equipment required, although it might be used)	Limited or Confined	No overburden; collected from surface
8	Rock Works	Yard-operations	Moderately easy (extraction by hydraulic excavator)	Extended	Unknown reserve
9	Three Rivers Stone	Large	Difficult (blasting required under confined or otherwise difficult conditions).	Extended	Extensive reserves > 10 years; overburden variable
10	Northern Stone--Granite quarry stop 1	Large	Difficult (blasting required under confined or otherwise difficult conditions).	Extended	Little overburden; extensive reserve
11	Northern Stone--Granite quarry stop 2	Large	Difficult (blasting required under confined or otherwise difficult conditions).	Extended	Little overburden; extensive reserve
12	Northern Stone--Middle Gold quarry	Large	Moderately difficult (blasting likely required, or extraction otherwise made difficult through extensive overburden, unfavorable structure, etc.)	Extended	Extensive reserves > 10 years
13	Northern Stone--Reds Middle quarry stop 1	Large	Moderately easy (extraction by hydraulic excavator)	Extended	Reserve large; overburden is small
14	Northern Stone--Reds Middle quarry stop 2	Large	Moderately easy (extraction by hydraulic excavator)	Extended	Reserve large; overburden is small
15	Northern Stone--Silver quarry	Large	Moderately easy (extraction by hydraulic excavator)	Extended	Reserve large; overburden is small
16	Northern Stone--South quarry	Large	Moderately easy (extraction by hydraulic excavator)	Extended	Reserve large; overburden is small

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Number_Products	Known_Products	Acres	Mining_Method	Hand_Methods
1	Scrivanich - Sec. 3 lower quarry	Small (1 - 2 products)	3/4"-minus; 3/4"-1" mason's choice; 1"-1-1/2" patio; 1-1/2-2" patio and tumbled; 2"-3" stepping; 2"-6" ledge; random blocks	5	Hand-mechanized combined	Hand split, sort
2	Scrivanich - Sec. 3 upper quarry	Probable (3-5 Products)	Flagstone	0.7	Hand-mechanized combined	Hand split, sort
3	Scrivanich-Rodriguez--sec. 10 lower quarry	Small (1 - 2 products)	Flagstone; random blocks	2	Hand-mechanized combined	Hand split, sort
4	Scrivanich-Rodriguez--sec. 10 stop 1	Small (1 - 2 products)	Flagstone; random blocks	10	Hand-mechanized combined	Hand split, sort
5	Scrivanich-Rodriguez--sec. 10 stop 2	Small (1 - 2 products)	Flagstone; random blocks	10	Hand-mechanized combined	Hand split, sort
6	Scrivanich (yard)	--	--	20	--	--
7	T. Rodriguez	Small (1 - 2 products)	Flagstone; random slabs	640	Hand only	Surface collection
8	Rock Works	Medium (3-5 products)	Ramshorn slate, Ramshorn antique; flagstone of foliated meta-igneous rock	3	Hand-mechanized combined	Hand split, sort
9	Three Rivers Stone	Medium (3-5 products)	Flagstone, large slabs of flagstone	80	Hand-mechanized combined	Hand split, sort
10	Northern Stone--Granite quarry stop 1	Small (1 - 2 products)	Flagstone; random slabs	--	Blasting, hand	Hand split, sort
11	Northern Stone--Granite quarry stop 2	Small (1 - 2 products)	Flagstone; random slabs	--	Blasting, hand	Hand split, sort
12	Northern Stone--Middle Gold quarry	Large (>5 products)	Flagstone, landscape rock, aquarium rock	--	Hand-mechanized combined	Hand split, sort
13	Northern Stone--Reds Middle quarry stop 1	Small (1 - 2 products)	Flagstone; random blocks	--	Hand-mechanized combined	Hand split, sort
14	Northern Stone--Reds Middle quarry stop 2	Small (1 - 2 products)	Flagstone; random blocks	--	Hand-mechanized combined	Hand split, sort
15	Northern Stone--Silver quarry	Small (1 - 2 products)	Flagstone; random blocks	--	Hand-mechanized combined	Hand split, sort
16	Northern Stone--South quarry	Small (1 - 2 products)	Flagstone; random blocks	--	Hand-mechanized combined	Hand split, sort

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Mining_Description	Production_rate
1	Scrivanich - Sec. 3 lower quarry	Loosen and load trucks with track excavator; haul to yard or splitting area	14000 tons (total, all operations)
2	Scrivanich - Sec. 3 upper quarry	Loosen and load trucks with track excavator; haul to yard or splitting area	--
3	Scrivanich-Rodriguez--sec. 10 lower quarry	Loosen and load trucks with track excavator; haul to yard or splitting area	--
4	Scrivanich-Rodriguez--sec. 10 stop 1	Loosen and load trucks with track excavator; haul to yard or splitting area	--
5	Scrivanich-Rodriguez--sec. 10 stop 2	Loosen and load trucks with track excavator; haul to yard or splitting area	--
6	Scrivanich (yard)		--
7	T. Rodriguez	Surface collection; no mechanized equipment; load on truck and haul to yard to sort and palletize	--
8	Rock Works	Dislodge with excavator, split and palletize in pit, haul pallets to yard along river	1 semi load per week (28 tons)
9	Three Rivers Stone	Drill, blast ore rock with light charge, split and palletized by hand; loader with 40-ton truck removes waste and process repeated; overburden is drilled and blasted with strong charge, then loaded and hauled to waste area in 40-ton truck	36,000 tons per year in 2004
10	Northern Stone--Granite quarry stop 1	Drill and blast; sort and palletize in blasted material	40,000 tons per year, all pits combined (SubTerra, 2004)
11	Northern Stone--Granite quarry stop 2	Drill and blast; sort and palletize in blasted material	40,000 tons per year, all pits combined (SubTerra, 2004)
12	Northern Stone--Middle Gold quarry	Loosen and move to splitting area with track excavator, hand splite and palletize	40,000 tons per year, all pits combined (SubTerra, 2004)
13	Northern Stone--Reds Middle quarry stop 1	Loosen and move to splitting area with track excavator, hand splite and palletize	40,000 tons per year, all pits combined (SubTerra, 2004)
14	Northern Stone--Reds Middle quarry stop 2		40,000 tons per year, all pits combined (SubTerra, 2004)
15	Northern Stone--Silver quarry	Loosen and move to splitting area with track excavator, hand splite and palletize	40,000 tons per year, all pits combined (SubTerra, 2004)
16	Northern Stone--South quarry	Loosen and move to splitting area with track excavator, hand splite and palletize	40,000 tons per year, all pits combined (SubTerra, 2004)

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Processing_onsite	Work_schedule	Personnel	Buildings
1	Scrivanich - Sec. 3 lower quarry	--	5.5 d/wk, Apr1-Nov15	Company-wide: 50 seasonal splitters (piece-rate, $30/ton aver., earn <$4000/mo); 16 seasonal hourly >$9.75/hr); 5 full time; none at this site at time of vist	--
2	Scrivanich - Sec. 3 upper quarry	--	See Scrivanich Sec. 3, lower quarry, for details about all operations	None at time of visit	--
3	Scrivanich-Rodriguez--sec. 10 lower quarry	--	See Scrivanich Sec. 3, lower quarry, for details about all operations	None at time of visit	--
4	Scrivanich-Rodriguez--sec. 10 stop 1	--	See Scrivanich Sec. 3, lower quarry, for details about all operations	None at time of visit	--
5	Scrivanich-Rodriguez--sec. 10 stop 2	--	See Scrivanich Sec. 3, lower quarry, for details about all operations	One operator working	--
6	Scrivanich (yard)	--	See Scrivanich Sec. 3, lower quarry, for details about all operations	Several workers	--
7	T. Rodriguez	--		None at time of visit	--
8	Rock Works	--	May-Sept. (longer if weather permits)	4 laborers, 1 owner and wife does bookkeeping	None
9	Three Rivers Stone	Split and palletize	Stripping: year-roundSplitters: 44 hrs/week, March-Dec. Operators: 3 on 3 off 7 days/wk	47 laborers @$650/week, 32 operators @$7-19/hr, 1 salaried	
10	Northern Stone--Granite quarry stop 1	--	--	2 laborers	--
11	Northern Stone--Granite quarry stop 2	--	--	None at time of visit; but indicates recent activity; rock on north wall newly loosend by large blast	--
12	Northern Stone--Middle Gold quarry	Hand sort, split and palletize	--	7 laborers, 1 operator	--
13	Northern Stone--Reds Middle quarry stop 1	Hand sort, split and palletize	--	13 laborers/operators	--
14	Northern Stone--Reds Middle quarry stop 2	--	--	Temporily inactive	--
15	Northern Stone--Silver quarry	Hand sort, split and palletize	--	5 laborers	--
16	Northern Stone--South quarry	Hand sort, split and palletize	--	2 laborers	--

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Equipment	Product_inventory
1	Scrivanich - Sec. 3 lower quarry	See list for details: 4 excavators: Komatsu, PC200, PC220, PC300, Fiat Allis FE28; wheel loaders: Cat IT-18, 910, 910, Case W14, W14, Trex30-31; forklift, Liftall; dozers: Cat-Dresser D-6, 977; Trucks: semi and haul, 8; pickups and vans, 8	3500 pallets
2	Scrivanich - Sec. 3 upper quarry	See Scrivanich Sec. 3, lower quarry, for details about all operations	--
3	Scrivanich-Rodriguez--sec. 10 lower quarry	See Scrivanich Sec. 3, lower quarry, for details about all operations	--
4	Scrivanich-Rodriguez--sec. 10 stop 1	See Scrivanich Sec. 3, lower quarry, for details about all operations	--
5	Scrivanich-Rodriguez--sec. 10 stop 2	See Scrivanich Sec. 3, lower quarry, for details about all operations	--
6	Scrivanich (yard)	See Scrivanich Sec. 3, lower quarry, for details about all operations	--
7	T. Rodriguez	Pickup truck	--
8	Rock Works	1 excavator, 1 6x4 haul truck, 1 forklift, Liftall EL-60	58 pallets
9	Three Rivers Stone	3 Komatsu HM-400 40-t haul truck, 3 Komatsu PC200LC 2 yd excavators, 2 Komatsu WA 450 and WA 500 wheel loaders, 5-7 yd, 1 Komatsu WA 250 forklift, 1, 6.5 in air drill and 1, 4.5 in airdrill, 2 misc. forklifts, 2 flatbed trucks, 1 school bus, 1 4000-gal water, 3 pickups, 1 ANFO truck,1 Galion T500 grader (large equipment is leased); drilling on 10'x10' staggered pattern with 4 lb anfo/hole in 12' lifts	--
10	Northern Stone--Granite quarry stop 1	1 track excavator, 1 Volvo wheel loader, 1 Bobcat loader	349 pallets: 1-2"; 2"-4"; 6"-8"; generic block
11	Northern Stone--Granite quarry stop 2	--	--
12	Northern Stone--Middle Gold quarry	2 forklifts, Volvo 70B, Volvo L120B;	227 pallets: ledge, 3/4"-1-1/4", smooth, drywall 3/8"-3/4"
13	Northern Stone--Reds Middle quarry stop 1	2 forklifts Volvo BM L50B, Volvo L70D; 2 track excavators, Hitachi EX400 and Volvo…	700 pallets: 1-1/2"-3"; 3/8"-3/4"; ledge; 3/4"-1-1/4"; drywall; smooth
14	Northern Stone--Reds Middle quarry stop 2	--	--
15	Northern Stone--Silver quarry	1 track excavator Komatsu EC200LC; Wheel loader Michigan 4 cu yd; 1 dozer, Cat D-4	229 pallets: smooth; special stepstone; dry wall; 3/8"-3/4"; 3/4"-1 1/4"
16	Northern Stone--South quarry	2 track excavators, Hitachi EX200, Volvo EC460	180 pallets: 3/8"-3/4"; landscape; ledgestone; 3/4'1-1/4"; smooth; LZ set

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Sales_price	Market_description	Destination
1	Scrivanich - Sec. 3 lower quarry	Calculated from price list, average: $138.75/ton	CA, OR, WA, UT, MT, ID, also MO, NV, MI and others, includes 2500 tons to 50 Lowe's stores; landscapers are possible customers	--
2	Scrivanich - Sec. 3 upper quarry	Calculated from price list, average: $138.75/ton	CA, OR, WA, UT, MT, ID, also MO, NV, MI and others, includes 2500 tons to 50 Lowe's stores	--
3	Scrivanich-Rodriguez--sec. 10 lower quarry	Calculated from price list, average: $138.75/ton	CA, OR, WA, UT, MT, ID, also MO, NV, MI and others, includes 2500 tons to 50 Lowe's stores	--
4	Scrivanich-Rodriguez--sec. 10 stop 1	Calculated from price list, average: $138.75/ton	CA, OR, WA, UT, MT, ID, also MO, NV, MI and others, includes 2500 tons to 50 Lowe's stores	--
5	Scrivanich-Rodriguez--sec. 10 stop 2	Calculated from price list, average: $138.75/ton	CA, OR, WA, UT, MT, ID, also MO, NV, MI and others, includes 2500 tons to 50 Lowe's stores	--
6	Scrivanich (yard)	Calculated from price list, average: $138.75/ton	CA, OR, WA, UT, MT, ID, also MO, NV, MI and others, includes 2500 tons to 50 Lowe's stores	--
7	T. Rodriguez	Recent sale: 100 tons @ $8.25/ton	--	--
8	Rock Works	$170/t, 2-4 inch, $210/ton for standup (1 inch thickness)	--	Ships to San Marcos, CA (major), Missouri, and Minnesota
9	Three Rivers Stone	Average, $219.9/ton	Major destinations (91%): CA, WA, ID, CO, OR	--
10	Northern Stone--Granite quarry stop 1	--	Load ourt 24 to 28 semi loads per week of 15-16 pallets each from entire operation; 3/4" stand-up flagstone is most popular because of large area coverage and represents most of shipments	--
11	Northern Stone--Granite quarry stop 2	--	Load ourt 24 to 28 semi loads per week of 15-16 pallets each from entire operation; 3/4" stand-up flagstone is most popular because of large area coverage and represents most of shipments	--
12	Northern Stone--Middle Gold quarry	--	Load ourt 24 to 28 semi loads per week of 15-16 pallets each from entire operation; 3/4" stand-up flagstone is most popular because of large area coverage and represents most of shipments	--
13	Northern Stone--Reds Middle quarry stop 1	--	Load ourt 24 to 28 semi loads per week of 15-16 pallets each from entire operation; 3/4" stand-up flagstone is most popular because of large area coverage and represents most of shipments	--
14	Northern Stone--Reds Middle quarry stop 2	--	Load ourt 24 to 28 semi loads per week of 15-16 pallets each from entire operation; 3/4" stand-up flagstone is most popular because of large area coverage and represents most of shipments	--
15	Northern Stone--Silver quarry	--	Load ourt 24 to 28 semi loads per week of 15-16 pallets each from entire operation; 3/4" stand-up flagstone is most popular because of large area coverage and represents most of shipments	--
16	Northern Stone--South quarry	--	Load ourt 24 to 28 semi loads per week of 15-16 pallets each from entire operation; 3/4" stand-up flagstone is most popular because of large area coverage and represents most of shipments	--

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Prod_1995	Prod_1996	Prod_1997	Prod_1998	Prod_1999	Prod_2000	Prod_2001	Prod_2002	Prod_2003	Prod_2004	Max_prod
1	Scrivanich - Sec. 3 lower quarry									17000	20000	20000
2	Scrivanich - Sec. 3 upper quarry											
3	Scrivanich-Rodriguez--sec. 10 lower quarry											
4	Scrivanich-Rodriguez--sec. 10 stop 1											
5	Scrivanich-Rodriguez--sec. 10 stop 2											
6	Scrivanich (yard)											
7	T. Rodriguez										100	100
8	Rock Works										784	784
9	Three Rivers Stone	2000								34000	36000	36000
10	Northern Stone--Granite quarry stop 1											
11	Northern Stone--Granite quarry stop 2											
12	Northern Stone--Middle Gold quarry											
13	Northern Stone--Reds Middle quarry stop 1											
14	Northern Stone--Reds Middle quarry stop 2											
15	Northern Stone--Silver quarry											
16	Northern Stone--South quarry											

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Comments
1	Scrivanich - Sec. 3 lower quarry	17,000 tons in 2003 and 20,000 in 2004
2	Scrivanich - Sec. 3 upper quarry	See Scrivanich Sec. 3, lower quarry, for details about all operations
3	Scrivanich-Rodriguez--sec. 10 lower quarry	See Scrivanich Sec. 3, lower quarry, for details about all operations
4	Scrivanich-Rodriguez--sec. 10 stop 1	See Scrivanich Sec. 3, lower quarry, for details about all operations
5	Scrivanich-Rodriguez--sec. 10 stop 2	See Scrivanich Sec. 3, lower quarry, for details about all operations
6	Scrivanich (yard)	See Scrivanich Sec. 3, lower quarry, for details about all operations
7	T. Rodriguez	Sells to Northern Stone for $125/ton who sells same for $250/ton
8	Rock Works	--
9	Three Rivers Stone	--
10	Northern Stone--Granite quarry stop 1	--
11	Northern Stone--Granite quarry stop 2	--
12	Northern Stone--Middle Gold quarry	--
13	Northern Stone--Reds Middle quarry stop 1	--
14	Northern Stone--Reds Middle quarry stop 2	--
15	Northern Stone--Silver quarry	--
16	Northern Stone--South quarry	--

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IDNo	Name	Alt_Name	Location_State	Surface_Mgmt	Case_Type	Visited	Photos	Sampled	Date_Visit	Status
17	Northern Stone--Top quarry	--	ID	Patented claims	Private	Yes	Yes	Yes	Aug 3 2004	Active
18	Northern Stone--Upper south quarry	--	ID	Patented claims	Private	Yes	Yes	Yes	Aug 3 2004	Active
19	Fish Creek	--	ID	Sawtooth NF	Claims	Yes	Yes	Yes	July 22 2004	Active
20	Kavalla--B & M Stone	--	MT	Kootenai NF	Material site	Yes	Yes	Yes	Aug 30 2004	Active
21	State quarry--Kavalla Ridge	--	MT	State of Montana	State of Montana lease	Yes	Yes	Yes	Aug 30 2004	Inactive
22	Kavalla Ridge--Robert Orr (pit 1)	--	MT	Private	Private	Yes	Yes	Yes	Aug 30 2004	Active
23	Kavalla Ridge--Robert Orr (pit 2)	--	MT	Private	Private	Yes	Yes	Yes	Aug 30 2004	Active
24	Kavalla Ridge--Robert Orr (pit 3)	--	MT	Private	Private	Yes	Yes	Yes	Aug 30 2004	Active
25	Hot Springs quarry	--	MT	Private	Private	Yes	Yes	Yes	Aug 31 2004	Active
26	Hwys 200 & 382 quarry along Flathead River	--	MT	Private	Private	Yes	Yes	Yes	Aug 31 2004	Active
27	Montana Rock Works (yard)	--	MT	Private	Private	Yes	Yes	No	Aug 31 2004	Active
28	Montana Stone Supply (yard)	--	MT	Private	Private	Yes	Yes	No	Aug 31 2004	Active
29	Stone Central (Yard)	--	MT	Private	Private	Yes	Yes	No	Aug 31 2004	Active
30	Unnamed quarry	--	MT	Unknown	Private	No	No	No	Aug 30 2004	Active
31	Unnamed quarry	--	MT	Unknown	Private	No	No	No	Aug 30 2004	Inactive
32	Unnamed quarry hwy 382	--	MT	Private	Private	Yes	Yes	Yes	Aug 31 2004	Active
33	Feller zebra marble (DOGMs Black Hills)	Black Hills	UT	Fillmore FO	Claims	Yes	Yes	Yes	May 27 2004	Active
34	Marjum Pass Commun. Pit	--	UT	Fillmore FO	Community Pit	Yes	Yes	Yes	May 28 2004	Active
35	Multi-colored Green Nos. 1-5/Pitchforth Springs	Pitchfork Springs	UT	Fillmore FO	Claims	Yes	Yes	Yes	May 27 2004	Active
36	Red Lace Common Use	--	UT	Fillmore FO	Common use	Yes	Yes	Yes	May 27 2004	Inactive
37	Rich Gulch-Black Rock crusher facility	--	UT	Fillmore FO	Claims	Yes	Yes	Yes	May 27 2004	Active
38	Rocanville/Wing JV Pit 1 (Tejon)	--	UT	Fillmore FO	Claims	Yes	Yes	Yes	May 28 2004	Active
39	Rocanville/Wing JV Pit 2 (Tejon)	--	UT	Fillmore FO	Claims	Yes	Yes	Yes	May 28 2004	Active

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Map_Name	Type_Site	Claim_Name	BLM_Case	SubTerra_Number	UT_DOGM_ID
17	Northern Stone--Top quarry	Lyman Pass 7.5	Quarry, 1 of 9	--	--	i020004	--
18	Northern Stone--Upper south quarry	Lyman Pass 7.5	Quarry, 1 of 9	--	--	i020004	--
19	Fish Creek	Basin 7.5	Quarry	--	--	i020007	i020008
20	Kavalla--B & M Stone	Libby 100 k	Quarry	--	--	--	--
21	State quarry--Kavalla Ridge	Libby 100 k	Quarry	--	--	--	--
22	Kavalla Ridge--Robert Orr (pit 1)	Kalispell 100 k	Quarry 1	--	--	--	--
23	Kavalla Ridge--Robert Orr (pit 2)	Kalispell 100 k	Quarry 2	--	--	--	--
24	Kavalla Ridge--Robert Orr (pit 3)	Libby 100 k	Quarry 3	--	--	--	--
25	Hot Springs quarry	Polson 100 k	Quarry and yard	--	--	--	--
26	Hwys 200 & 382 quarry along Flathead River	Plains MT 100k	Quarry	--	--	--	--
27	Montana Rock Works (yard)	Kalispell 100 k	Yard, retail	--	--	--	--
28	Montana Stone Supply (yard)	Kalispell 100 k	Yard	--	--	--	--
29	Stone Central (Yard)	Polson 100 k	Yard	--	--	--	--
30	Unnamed quarry	Plains MT 100k	Quarry	--	--	--	--
31	Unnamed quarry	Polson 100 k	Quarry	--	--	--	--
32	Unnamed quarry hwy 382	Plains MT 100k	Quarry	--	--	--	--
33	Feller zebra marble (DOGMs Black Hills)	Wah Wah North	Quarry	Black Hills 2-5	UTU 070666	s270027	s270057
34	Marjum Pass Commun. Pit	Tule Valley	Quarry	--	UTU 078274	UTU 072892	
35	Multi-colored Green Nos. 1-5/Pitchforth Springs	Wah Wah North	Quarry	--	UTU 070674	s270033	s270033
36	Red Lace Common Use	Wah Wah North	Surface collection only	--	UTU 072884	--	--
37	Rich Gulch-Black Rock crusher facility	Richfield 100K	Quarry and crusher plant	--	UTU 078286	s270088	s270088
38	Rocanville/Wing JV Pit 1 (Tejon)	Tule Valley	Quarry, Middle pit 1	--	UTU 079464	s270090	m270087
39	Rocanville/Wing JV Pit 2 (Tejon)	Tule Valley	Quarry, Pit 2	--	UTU 079464	s270090	m270087

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	UT_SITLA_ID	Data_Source	Operator_Name
17	Northern Stone--Top quarry	--	Gary Mullard, owner; Garth Greenwell, manager; SubTerra (2004)	Northern Stone Supply Co.
18	Northern Stone--Upper south quarry	--	Gary Mullard, owner; Garth Greenwell, manager; SubTerra (2004)	Northern Stone Supply Co.
19	Fish Creek	--	Alberto; John (operators); SubTerra (2004)	American Stone, Lon Thomas
20	Kavalla--B & M Stone	--	Lynn Hagarty Kootenai NF	B & M Stone
21	State quarry--Kavalla Ridge	--	Lynn Hagarty Kootenai NF	State of Montana
22	Kavalla Ridge--Robert Orr (pit 1)	--	Lynn Hagarty Kootenai NF	Orr, Robert / Plum Creek Timber Lease
23	Kavalla Ridge--Robert Orr (pit 2)	--	Lynn Hagarty Kootenai NF	Orr, Robert / Plum Creek Timber Lease
24	Kavalla Ridge--Robert Orr (pit 3)	--	Lynn Hagarty Kootenai NF	Orr, Robert / Plum Creek Timber Lease
25	Hot Springs quarry	--	Jake Cremer, owner	Perma Stone
26	Hwys 200 & 382 quarry along Flathead River	--	Jake Cremer, owner	Perma Stone
27	Montana Rock Works (yard)	--	Bob Shiesl, Gen Mgr.	Montana Rockworks
28	Montana Stone Supply (yard)	--	Jim Norvell	Montana Stone Supply
29	Stone Central (Yard)	--	Travis King	Stone Central
30	Unnamed quarry	--	--	Unknown
31	Unnamed quarry	--	--	Unknown
32	Unnamed quarry hwy 382	--	Found no one on site	Unknown
33	Feller zebra marble (DOGMs Black Hills)	--	Jerry Mansfield, Fillmore FO, case file; UT DOGM; SubTerra (2004); UT DOGM	A & R Leasing, Russ Feller
34	Marjum Pass Commun. Pit	--	Case file; SubTerra (2004)	Bureau of Land Management
35	Multi-colored Green Nos. 1-5/Pitchforth Springs	--	Case file; SubTerra (2004); UT DOGM	Fitzgerald, Paul, Contractor
36	Red Lace Common Use	--	Jerry Mansfield, Fillmore FO, case file	Bureau of Land Management
37	Rich Gulch-Black Rock crusher facility	--	Jerry Mansfield, Fillmore FO, case file; SubTerra (2004); UT DOGM	Rocanville Stone Corp., Mert Hamilton
38	Rocanville/Wing JV Pit 1 (Tejon)	--	Case file; UT DOGM	Rocanville Stone Corp., Mert Hamilton
39	Rocanville/Wing JV Pit 2 (Tejon)	--	Case file; UT DOGM	Rocanville Stone Corp., Mert Hamilton

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Operator_Address	Operator_State	Operator_Tele	Location_Descr
17	Northern Stone--Top quarry	Box 249 Oakley, ID	ID	208-862-3353	8 mi S. of Oakley
18	Northern Stone--Upper south quarry	Box 249 Oakley, ID	ID	208-862-3353	8 mi S. of Oakley
19	Fish Creek	Salt Lake City UT	UT	801-262-4300 Roger	10 mi S. of Oakley ID
20	Kavalla--B & M Stone	Libby	MT	--	From Fisher Creek E. from Libby to Wolf Cr. Rd. to FS 2346 to FS 2363 for 2.1 mi
21	State quarry--Kavalla Ridge	Libby	MT	--	W. side of Kavalla Ridge
22	Kavalla Ridge--Robert Orr (pit 1)	Libby	MT	--	From Fisher Creek Rd. east of Libby, MT 2 mi on FS rd 2383 then 3 mi east on Surprise Hill Rd to quarry
23	Kavalla Ridge--Robert Orr (pit 2)	Libby	MT	--	From Fisher Creek Rd. east of Libby, MT 2 mi on FS rd 2383 then 3 mi east on Surprise Hill Rd to quarry
24	Kavalla Ridge--Robert Orr (pit 3)	Libby	MT	--	From Fisher Creek Rd. east of Libby, MT 2 mi on FS rd 2383 then 3 mi east on Surprise Hill Rd to quarry
25	Hot Springs quarry	PO Box 597 Hot Springs	MT	406-741-2279, 406-250-7196 cell	Cross Rd on Hot Springs to Perma Hwy (382)
26	Hwys 200 & 382 quarry along Flathead River	PO Box 597 Hot Springs	MT	406-741-2279, 406-250-7196 cell	At intersection of Highways 382 and 200 on S side of Hwy
27	Montana Rock Works (yard)	Kalispell	MT	406-752-7625	2-3 mi North of Kalispell
28	Montana Stone Supply (yard)	PO Box 1269 Marion	MT	406-854-9331	12 W. of Kalispell on Hwy 2, at Marion MT
29	Stone Central (Yard)	Hot Springs	MT	406-544-2777	Near Hot Springs on Hwy 382
30	Unnamed quarry	Plains	MT		? Mi east of Plains
31	Unnamed quarry	Plains	MT		? Mi west of Plains
32	Unnamed quarry hwy 382	--	MT	--	On E side of Hwy 382, and 2-3 mi N. of Hwy 200 intersection
33	Feller zebra marble (DOGMs Black Hills)	688 E Chad Ranch Rd Veyo, UT 84742	UT	435-574-9300	E. side House Range
34	Marjum Pass Commun. Pit	--	UT	--	S. end Middle Range part of House Range
35	Multi-colored Green Nos. 1-5/Pitchforth Springs	455 N. Main Box 668 Milford UT 84745	UT	435-387-5001, -7815	East of Wah Wah Playa on W. side San Francisco Mtns
36	Red Lace Common Use	--	UT	--	--
37	Rich Gulch-Black Rock crusher facility	Box 35 Delta, UT 84624	UT	435-864-5242, 864-8987 cell	--
38	Rocanville/Wing JV Pit 1 (Tejon)	PO Box 35 Delta UT	UT	435-8645242	North Canyon in House Range
39	Rocanville/Wing JV Pit 2 (Tejon)	PO Box 35 Delta UT	UT	435-8645243	North Canyon in House Range

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Location_County	Tp	Rg	Sec&Sub	Lat_dd	Long_dd	UTM_E	UTM_N	UTM_Zone	Coll_Method
17	Northern Stone--Top quarry	Cassia	15 S	22 E	23	42.1125	-113.8497	264399	4666193	12T	Recorded
18	Northern Stone--Upper south quarry	Cassia	15 S	22 E	22	42.1118	-113.8533	264100	4666128	12T	Recorded
19	Fish Creek	Cassia	15 S	23 E	10	42.1322	-113.7510	272625	4667919	12T	Recorded
20	Kavalla--B & M Stone	Lincoln	29 N	27 W	20 ne	48.2672	-115.0688	643314	5347815	11U	Recorded
21	State quarry--Kavalla Ridge	Lincoln	29 N	27 W	14 sese	48.2722	-115.0050	648026	5348471	11U	Recorded
22	Kavalla Ridge--Robert Orr (pit 1)	Lincoln	29 N	27 W	13 sw	48.2720	-114.9922	648984	5348494	11U	Recorded
23	Kavalla Ridge--Robert Orr (pit 2)	Lincoln	29 N	27 W	13 sw	48.2700	-114.9965	648665	5348245	11U	Recorded
24	Kavalla Ridge--Robert Orr (pit 3)	Lincoln	29 N	27 W	14 sese	48.2737	-115.0010	648322	5348655	11U	Recorded
25	Hot Springs quarry	Sanders	20 N	17 W	4	47.5152	-114.6083	680069	5265196	11T	Recorded
26	Hwys 200 & 382 quarry along Flathead River	Sanders	19 N	23 W	31	47.3647	-114.5792	682784	5248547	11T	Recorded
27	Montana Rock Works (yard)	Flathead	29 N	21 W	21	48.2550	-114.2716	702516	5348239	11U	Recorded
28	Montana Stone Supply (yard)	Flathead	27 N	24 W	33	48.0570	-114.6952	671732	5325211	11U	Recorded
29	Stone Central (Yard)	Sanders	22 N	24 W	25	47.6305	-114.6260	678340	5277966	11T	Recorded
30	Unnamed quarry	Sanders	19 N	25 W	28	47.3698	-114.7932	666605	5248626	11T	Recorded
31	Unnamed quarry	Sanders	20 N	27 W	1	47.5147	-114.9745	652406	5264348	11T	Recorded
32	Unnamed quarry hwy 382	Sanders	19 N	23 W	18	47.4072	-114.5840	682272	5253253	11T	Recorded
33	Feller zebra marble (DOGMs Black Hills)	Millard	23 S	13 W	11 swsw, n2se, 15, nene	38.8274	-113.2752	301838	4299688	12S	Copy from SubTerra
34	Marjum Pass Commun. Pit	Millard	17 S	13 W	34	39.2942	-113.3080	300966	4351964	12S	Recorded
35	Multi-colored Green Nos. 1-5/Pitchforth Springs	Millard	25 S	13 W	35 nese, swnw	38.5923	-113.2696	302335	4273975	12S	Copy from SubTerra
36	Red Lace Common Use	Millard	22 S	13 W	21 se	38.8789	-113.2934	301064	4305840	12S	Read from ArcMap
37	Rich Gulch-Black Rock crusher facility	Millard	23 S	10 W	33 all	38.7791	-112.9669	329145	4294100	12S	Modified
38	Rocanville/Wing JV Pit 1 (Tejon)	Millard	18 S	13 W	30 nwse, swne	39.2132	-113.3525	296894	4343072	12S	Recorded
39	Rocanville/Wing JV Pit 2 (Tejon)	Millard	18 S	13 W	30+	39.2108	-113.3512	296999	4342803	12S	Recorded

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Color	Geology	Generalized_Rock_Unit
17	Northern Stone--Top quarry	White	Elba Quartzite (pC)	ElbaQtz_pC
18	Northern Stone--Upper south quarry	Very light gray	Elba Quartzite (pC)	ElbaQtz_pC
19	Fish Creek	Light gray	Elba Quartzite (pC)	ElbaQtz_pC
20	Kavalla--B & M Stone	Gray	Prichard Form. (Pre-Camb.)	Prichard
21	State quarry--Kavalla Ridge	Gray	Prichard Form. (Pre-Camb.)	Prichard
22	Kavalla Ridge--Robert Orr (pit 1)	Medium gray	Prichard Form. (Pre-Camb.)	Prichard
23	Kavalla Ridge--Robert Orr (pit 2)	Medium gray	Prichard Form. (Pre-Camb.)	Prichard
24	Kavalla Ridge--Robert Orr (pit 3)	Medium gray	Prichard Form. (Pre-Camb.)	Prichard
25	Hot Springs quarry	Brown	Revett (?) Form. (Pre-Camb.)	Revett
26	Hwys 200 & 382 quarry along Flathead River	Gray	Prichard Form. (Pre-Camb.)	Prichard
27	Montana Rock Works (yard)	--	--	--
28	Montana Stone Supply (yard)	--	--	--
29	Stone Central (Yard)	--	--	--
30	Unnamed quarry	Gray	Prichard Form. (Pre-Camb.)	Prichard
31	Unnamed quarry		Prichard Form. (Pre-Camb.)	Prichard
32	Unnamed quarry hwy 382	Gray	Prichard Form. (Pre-Camb.)	Prichard
33	Feller zebra marble (DOGMs Black Hills)	Black-White	Notch Peak Form. (Cambrian)	NotchPeak_C
34	Marjum Pass Commun. Pit	Gray	Marjum Form. (Cambrian)	Marjum
35	Multi-colored Green Nos. 1-5/Pitchforth Springs	Reddish brown	Inkom Form. (pC)	Inkom
36	Red Lace Common Use	Reddish brown	Late Tertiary andesite-trachyte-latite flows (T2af unit)	VolcFlows
37	Rich Gulch-Black Rock crusher facility	Dark gray	Marjum Form. (Cambrian)	Marjum
38	Rocanville/Wing JV Pit 1 (Tejon)	Reddish brown	Weeks Form. (Cambrian)	Weeks_Camb
39	Rocanville/Wing JV Pit 2 (Tejon)	Light red	Weeks Form. (Cambrian)	Weeks_Camb

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IDNo	Name	Lithologic_Description	Generalized_Lithology
17	Northern Stone--Top quarry	Quartzite, flaggy, near white color, 2-3 percent muscovite in large patches promotes splitting along planes	Quartzite
18	Northern Stone--Upper south quarry	Quartzite, flaggy, very light gray, 2-3 percent muscovite in large patches promotes splitting along planes	Quartzite
19	Fish Creek	Quartzite, with micaceous partings	Quartzite
20	Kavalla--B & M Stone	Argillite, gray; Clay partings allow splitting into slabs of .5-4 in	Argillite
21	State quarry--Kavalla Ridge	Argillite, gray	Argillite
22	Kavalla Ridge--Robert Orr (pit 1)	Argillite, gray	Argillite
23	Kavalla Ridge--Robert Orr (pit 2)	Argillite, gray	Argillite
24	Kavalla Ridge--Robert Orr (pit 3)	Argillite, gray	Argillite
25	Hot Springs quarry	Quartzite and sandstone slabs, brown	Quartzite
26	Hwys 200 & 382 quarry along Flathead River	Argillite, gray	Argillite
27	Montana Rock Works (yard)	Photographs taken of all varieties of stone in inventory	--
28	Montana Stone Supply (yard)	Photographs taken of all varieties of stone in inventory	--
29	Stone Central (Yard)	--	--
30	Unnamed quarry	Argillite, gray color	Argillite
31	Unnamed quarry	--	Argillite
32	Unnamed quarry hwy 382	Argillite, gray	Argillite
33	Feller zebra marble (DOGMs Black Hills)	Marble, "zebra", black/white, from 0.5 ft-3 ft thck layer	Marble
34	Marjum Pass Commun. Pit	Shale, fissile gray	Shale
35	Multi-colored Green Nos. 1-5/Pitchforth Springs	Argillite, silty, flagstone, multi-colored green with iron oxide coatings	Argillite
36	Red Lace Common Use	Boulders, of red rhyolite	Boulders
37	Rich Gulch-Black Rock crusher facility	Limestone, dark gray, (appears high-Ca)	Limestone
38	Rocanville/Wing JV Pit 1 (Tejon)	Limestone, shaley, silty mudstone, silty sandstone	Limestone
39	Rocanville/Wing JV Pit 2 (Tejon)	Limestone, shaley, silty mudstone, silty sandstone	Limestone

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Other_characteristics	Extraction_Fractures_Cleavability	Product_Dimension_Fractures_Cleavability
17	Northern Stone--Top quarry	Splits regularly along mica partings, very hard to brittle, durable; color	Favorable with respect to extraction	Favorable with respect to product dimensions.
18	Northern Stone--Upper south quarry	Splits regularly along mica partings, very hard to brittle, durable; color	Favorable with respect to extraction	Favorable with respect to product dimensions.
19	Fish Creek	Hard, durable quartzite; med. Gray color with silvery luster; breaks along partings 3/4"-2" apart	Favorable with respect to extraction	Favorable with respect to product dimensions.
20	Kavalla--B & M Stone	Slabs of flagstone exhibit exceptionally flat layering; very durable; weathering causes discoloration due to iron content	Favorable with respect to extraction	Favorable with respect to product dimensions.
21	State quarry--Kavalla Ridge	Argillite is very durable; forms large sheets with very flat bedding; contains high pyrite content so weathers "rusty" in short time	Favorable with respect to extraction	Favorable with respect to product dimensions.
22	Kavalla Ridge--Robert Orr (pit 1)	Argillite is durable; has considerable strength as breaks into very wide sheets which must be reduced to load on pallets; bedding forms exceptionally flat, level surfaces.	Favorable with respect to extraction	Favorable with respect to product dimensions.
23	Kavalla Ridge--Robert Orr (pit 2)	Argillite is durable; has considerable strength as breaks into very wide sheets which must be reduced to load on pallets; bedding forms exceptionally flat, level surfaces.	Favorable with respect to extraction	Favorable with respect to product dimensions.
24	Kavalla Ridge--Robert Orr (pit 3)	Argillite is durable; has considerable strength as breaks into very wide sheets which must be reduced to load on pallets; bedding forms exceptionally flat, level surfaces.	Favorable with respect to extraction	Favorable with respect to product dimensions.
25	Hot Springs quarry	splits into slabs of 1 in, 2 in, 3-4 in; long slabs for mantles, splits into thin sheets and remains durable and hard	Favorable with respect to extraction	Favorable with respect to product dimensions.
26	Hwys 200 & 382 quarry along Flathead River	--	Favorable with respect to extraction	Favorable with respect to product dimensions.
27	Montana Rock Works (yard)	--	--	--
28	Montana Stone Supply (yard)	--	--	--
29	Stone Central (Yard)	--	--	--
30	Unnamed quarry	--		--
31	Unnamed quarry	--		--
32	Unnamed quarry hwy 382	--	Favorable with respect to extraction	Favorable with respect to product dimensions.
33	Feller zebra marble (DOGMs Black Hills)	--	Not Applicable.	Unfavorable with respect to product dimensions
34	Marjum Pass Commun. Pit	--	Favorable with respect to extraction	Favorable with respect to product dimensions.
35	Multi-colored Green Nos. 1-5/Pitchforth Springs	Hard and durable; readily breaks into thin sheets	Favorable with respect to extraction	Favorable with respect to product dimensions.
36	Red Lace Common Use	--	Not Applicable.	Not applicable
37	Rich Gulch-Black Rock crusher facility	High Ca content; Chemcial analysis: 91.8% CaCO3, 7.343% MgCO3; 0.75% impurities	Not Applicable.	Not applicable
38	Rocanville/Wing JV Pit 1 (Tejon)	Large quantities of thin (1" thick) flagstone slabs	Favorable with respect to extraction	Favorable with respect to product dimensions.
39	Rocanville/Wing JV Pit 2 (Tejon)	Large quantities of thin (1" thick) flagstone slabs	Favorable with respect to extraction	Favorable with respect to product dimensions.

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Influence_of_Texture	Uniform_Thickness	Lithology_Hardness_Durability	Rock_Quality_Suitability
17	Northern Stone--Top quarry	Likely influence	Yes	Advantageous	Good quality flagstone is produced
18	Northern Stone--Upper south quarry	Likely influence	Yes	Advantageous	Good quality flagstone is produced
19	Fish Creek	No Influence	No	Advantageous	Good quality
20	Kavalla--B & M Stone	Likely influence	Yes	Moderately Advantageous	Fissile nature of metamorphic rock improves product quality
21	State quarry--Kavalla Ridge	Likely influence	Yes	Moderately Advantageous	Fissile nature of metamorphic rock improves product quality; high pyrite content which can stain rock on weathering limits usefulness
22	Kavalla Ridge--Robert Orr (pit 1)	Likely influence	Yes	Moderately Advantageous	Fissile nature of metamorphic rock improves product quality
23	Kavalla Ridge--Robert Orr (pit 2)	Likely influence	Yes	Moderately Advantageous	Fissile nature of metamorphic rock improves product quality
24	Kavalla Ridge--Robert Orr (pit 3)	Likely influence	Yes	Moderately Advantageous	Fissile nature of metamorphic rock improves product quality
25	Hot Springs quarry	No Influence	Yes	Moderately Advantageous	Good quality flagstone
26	Hwys 200 & 382 quarry along Flathead River	Likely influence	Yes	Moderately Advantageous	Fissile nature of metamorphic rock improves product quality
27	Montana Rock Works (yard)	--	--	--	--
28	Montana Stone Supply (yard)	--	--	--	--
29	Stone Central (Yard)	--	--	--	--
30	Unnamed quarry	--	--	--	--
31	Unnamed quarry	--	--	--	--
32	Unnamed quarry hwy 382	Likely influence	Yes	Moderately Advantageous	Fissile nature of metamorphic rock improves product quality
33	Feller zebra marble (DOGMs Black Hills)	No Influence	No	Advantageous	Unknown
34	Marjum Pass Commun. Pit	No Influence	Yes	Moderately Advantageous	Moderately hard; difficult to extract within dimensions of current pit outline
35	Multi-colored Green Nos. 1-5/Pitchforth Springs	No Influence	Yes	Advantageous	Moderate durability for flagstone
36	Red Lace Common Use	No Influence	No	Moderately Advantageous	Boulder supply limited due to extent of area defined for extraction
37	Rich Gulch-Black Rock crusher facility	No Influence	No	Advantageous	A metallurgical grade limestone
38	Rocanville/Wing JV Pit 1 (Tejon)	Likely influence	Yes	Advantageous	Varieties of flagstone removed from several small pits
39	Rocanville/Wing JV Pit 2 (Tejon)	Likely influence	Yes	Advantageous	Varieties of flagstone removed from several small pits

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Size	Ease_of_Extraction	Extent_of_Deposit	Reserve_Limits_Overburden
17	Northern Stone--Top quarry	Large	Moderately easy (extraction by hydraulic excavator)	Extended	Reserve large; overburden is small
18	Northern Stone--Upper south quarry	Large	Moderately easy (extraction by hydraulic excavator)	Extended	Reserve large; overburden is small
19	Fish Creek	Large	Moderately easy (extraction by ripping)	Extended	Extensive > 10 year reserve; 5 ft overburden
20	Kavalla--B & M Stone	Medium-Material site	Moderately easy	Extended	Overburden is little problem
21	State quarry--Kavalla Ridge	Medium	Moderately easy	Extended	Overburden is little problem
22	Kavalla Ridge--Robert Orr (pit 1)	Medium	Moderately easy	Extended	Overburden is little problem
23	Kavalla Ridge--Robert Orr (pit 2)	Medium	Moderately easy	Extended	Overburden is little problem
24	Kavalla Ridge--Robert Orr (pit 3)	Medium	Moderately easy	Extended	Overburden is little problem
25	Hot Springs quarry	Small	Moderately easy	Extended	Overburden hampers extraction at limits of pit
26	Hwys 200 & 382 quarry along Flathead River	Medium	Moderately easy	Extended	Overburden hampers extraction beyond limit of current pit
27	Montana Rock Works (yard)	Yard-wholesale	--	--	--
28	Montana Stone Supply (yard)	Yard-retail	--	--	--
29	Stone Central (Yard)	Yard-wholesale	--	--	--
30	Unnamed quarry	Small	--	--	--
31	Unnamed quarry	Small	--	--	--
32	Unnamed quarry hwy 382	Small	Moderately easy	Extended	Overburden hampers extraction beyond limit of current pit
33	Feller zebra marble (DOGMs Black Hills)	Small	Difficult (blasting required under confined or otherwise difficult conditions).	Limited or Confined	Extensive reserves > 10 years
34	Marjum Pass Commun. Pit	Small-Material site	Moderately easy	Surficial	Few thousand tons; ~5 ft overburden
35	Multi-colored Green Nos. 1-5/Pitchforth Springs	Small	Moderately easy (extraction by ripping)	Extended	Unknown reserve
36	Red Lace Common Use	Small-Material site	Very easy (no mechanized equipment required, although it might be used)	Not applicable	Not applicable
37	Rich Gulch-Black Rock crusher facility	Medium	Difficult (blasting required under confined or otherwise difficult conditions).	Extended	Several thousand tons in mine area, large adjacent undeveloped reserves.
38	Rocanville/Wing JV Pit 1 (Tejon)	Medium	Very easy (no mechanized equipment required, although it might be used)	Extended	Several thousand tons in mine area, large adjacent undeveloped reserves.
39	Rocanville/Wing JV Pit 2 (Tejon)	Large	Very easy (no mechanized equipment required, although it might be used)	Extended	Several thousand tons in mine area, large adjacent undeveloped reserves.

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Number_Products	Known_Products	Acres	Mining_Method	Hand_Methods
17	Northern Stone--Top quarry	Small (1 - 2 products)	Flagstone; random blocks	--	Hand-mechanized combined	Hand split, sort
18	Northern Stone--Upper south quarry	Small (1 - 2 products)	Flagstone; random blocks	--	Hand-mechanized combined	Hand split, sort
19	Fish Creek	Small (1 - 2 products)	Flagstone	Pit 9 ac; yard 20-25 ac	Hand-mechanized combined	Hand split, sort
20	Kavalla--B & M Stone	Medium (3-5 products)	Gray argillite flagstone	6	Hand only	Hand split, sort
21	State quarry--Kavalla Ridge	Medium (3-5 products)	Gray argillite flagstone	--	Hand only	Hand split, sort
22	Kavalla Ridge--Robert Orr (pit 1)	Medium (3-5 products)	Gray argillite flagstone	--	Hand-mechanized combined	Hand split, sort
23	Kavalla Ridge--Robert Orr (pit 2)	Medium (3-5 products)	Gray argillite flagstone	--	Hand-mechanized combined	Hand split, sort
24	Kavalla Ridge--Robert Orr (pit 3)	Medium (3-5 products)	Gray argillite flagstone	--	Hand-mechanized combined	Hand split, sort
25	Hot Springs quarry	Small (1 - 2 products)	Sandstone slabs, patio slabs (brochure); flagstone	--	Hand-mechanized combined	Hand split, sort
26	Hwys 200 & 382 quarry along Flathead River	Small (1 - 2 products)	Flaggy argillite	5	Hand-mechanized combined	Hand split, sort
27	Montana Rock Works (yard)	--	--	--	--	--
28	Montana Stone Supply (yard)	--	Sandstone and quartzite slabs, random slabs	--	--	--
29	Stone Central (Yard)	--	--	--	--	--
30	Unnamed quarry	--	flagstone	--	Unknown	Unknown
31	Unnamed quarry	--	flagstone	--	Unknown	Unknown
32	Unnamed quarry hwy 382	Small (1 - 2 products)	Flaggy argillite	--	Hand-mechanized combined	Hand split, sort
33	Feller zebra marble (DOGMs Black Hills)	Small (1 - 2 products)	Possibly a commercial limestone test prospect	3	Hand-mechanized combined	Hand split, sort
34	Marjum Pass Commun. Pit	Small (1 - 2 products)	flagstone: select, patio, and thin varieties	2	Hand-mechanized combined	Hand split, sort
35	Multi-colored Green Nos. 1-5/Pitchforth Springs	Medium (3-5 products)	Flagstone	--	Hand-mechanized combined	Hand split, sort
36	Red Lace Common Use	Small (1 - 2 products)	Red rhyolite boulders @$14/ton	>10	Hand only	Surface collection
37	Rich Gulch-Black Rock crusher facility	Small (1 - 2 products)	Specialty metallurgical material crushed and placed in super sacks	10	Mechanized	None
38	Rocanville/Wing JV Pit 1 (Tejon)	Large (>5 products)	Flagstone of various composition, colors and thickness	10	Hand only	Hand split, sort
39	Rocanville/Wing JV Pit 2 (Tejon)	Large (>5 products)	Flagstone of various composition, colors and thickness	--	Hand only	Hand split, sort

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Mining_Description	Production_rate
17	Northern Stone--Top quarry	Loosen and move to splitting area with track excavator, hand splite and palletize	40,000 tons per year, all pits combined (SubTerra, 2004)
18	Northern Stone--Upper south quarry	Loosen and move to splitting area with track excavator, hand splite and palletize	40,000 tons per year, all pits combined (SubTerra, 2004)
19	Fish Creek	Break out with dozer or track excavator; carry to splitting area with wheel loader; hand split and palletize	40tons/day x 5d/week x 4wk/mo. x 5 mos./yr = 4000 tons/yr; ship 1 to 5 semi loads/week (12 pallets ea.); 5 to 10 15-ton-dump truck loads removed from pit to splitting area in yard per day (50% waste);
20	Kavalla--B & M Stone	--	--
21	State quarry--Kavalla Ridge	--	--
22	Kavalla Ridge--Robert Orr (pit 1)	--	--
23	Kavalla Ridge--Robert Orr (pit 2)	--	--
24	Kavalla Ridge--Robert Orr (pit 3)	--	--
25	Hot Springs quarry	excavate with track excavator	--
26	Hwys 200 & 382 quarry along Flathead River	excavate	--
27	Montana Rock Works (yard)	--	--
28	Montana Stone Supply (yard)	--	--
29	Stone Central (Yard)	--	--
30	Unnamed quarry	--	--
31	Unnamed quarry	--	--
32	Unnamed quarry hwy 382	--	--
33	Feller zebra marble (DOGMs Black Hills)	Dig with hyd. excavator, load on flatbed trailer	--
34	Marjum Pass Commun. Pit	--	--
35	Multi-colored Green Nos. 1-5/Pitchforth Springs	Air hammer to dislodge, sort, and palletize	90 t/yr of product; probably 62,500 tons removed over lifetime since 1980s
36	Red Lace Common Use	Load boulders on surface for personal use	--
37	Rich Gulch-Black Rock crusher facility	Drill, blast, dig with excavator and move rock to crusher area	Past production ~1000 tons; expected 60,000 tpy
38	Rocanville/Wing JV Pit 1 (Tejon)	Drill, blast, dig with excavator and move rock to splitters work area	mine plan: 5000 tons/5 yrs
39	Rocanville/Wing JV Pit 2 (Tejon)	Drill, blast, dig with excavator and move rock to splitters work area	--

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Processing_onsite	Work_schedule	Personnel	Buildings
17	Northern Stone--Top quarry	Hand sort, split and palletize	--	13 laborers/operators	--
18	Northern Stone--Upper south quarry	Hand sort, split and palletize	--	None	--
19	Fish Creek	split; separate by size on pallets	10 hr/d; 5 d/wk; May1-Nov1	10 splitters and 5 laborers (yard) 2 operators	--
20	Kavalla--B & M Stone	--	--	6 laborers ($110/d + weekly bonus), 1 operator, 1 foreman	--
21	State quarry--Kavalla Ridge	--	--	--	--
22	Kavalla Ridge--Robert Orr (pit 1)	--	--	--	--
23	Kavalla Ridge--Robert Orr (pit 2)	--	--	--	--
24	Kavalla Ridge--Robert Orr (pit 3)	--	--	--	--
25	Hot Springs quarry	split and break into slabs with cris-cutter	--	2 laborers, 2 operators	--
26	Hwys 200 & 382 quarry along Flathead River	--	--	2 operators	--
27	Montana Rock Works (yard)	--	--		--
28	Montana Stone Supply (yard)	--	--	7 laborers, 2 truck drivrs, 1 sales person; 14 total	--
29	Stone Central (Yard)	--	--	--	--
30	Unnamed quarry	--	--	--	--
31	Unnamed quarry	--	--	--	--
32	Unnamed quarry hwy 382	--	--	2 operators, 2 laborers	--
33	Feller zebra marble (DOGMs Black Hills)	There is 2-3 ft of usable material in 15' mining face; hand selected at site and load onto pallets	3-5 days per year	3 laborers	--
34	Marjum Pass Commun. Pit	--	--	--	--
35	Multi-colored Green Nos. 1-5/Pitchforth Springs	--	45 d/yr, 5 d/wk	1 owner; 1 laborer	--
36	Red Lace Common Use	--	--	--	--
37	Rich Gulch-Black Rock crusher facility	Crush to minus 50 mesh	--	5	Office/controller shack
38	Rocanville/Wing JV Pit 1 (Tejon)	--	8 mos/yr	5 laborers; 1 foreman	--
39	Rocanville/Wing JV Pit 2 (Tejon)	--	--	--	--

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IDNo	Name	Equipment	Product_inventory
17	Northern Stone--Top quarry	2 wheel loaders; 1 forklift	1200 pallets: 3/8"-3/4"; 3/4"-1-1/2"; smooth; pool; drywall
18	Northern Stone--Upper south quarry	None	173 pallets: 3/8-3/4"; 3/4"-1-1/4"
19	Fish Creek	4 track excavators Komatsu 220; 1 dozer D-8 Cat; 1 Komatsu wheel loader WA 320; 1 15-ton dump truck; 1 semi w/flatbed	In pallets of flagstone: 23, upright 1.5"-2"; 32 4x10"; 12, 2" x 3'; 13 3" x3" bricks; 2, 6"x6" tiles.
20	Kavalla--B & M Stone	1 Gehl forklift, 1 takaeuchi track excavator (.5 cuyd)	11 pallets, 3-4 in; 30 pallets, .5-1 in; 15 pallets, large block
21	State quarry--Kavalla Ridge	--	--
22	Kavalla Ridge--Robert Orr (pit 1)	--	12 pallets and 88 pallets in yard
23	Kavalla Ridge--Robert Orr (pit 2)	1 CAT track excavator, 1 CAT forklift	72 pallets
24	Kavalla Ridge--Robert Orr (pit 3)	--	23 pallets
25	Hot Springs quarry	1 CrisCutter, 1 CAT track excavator, 1 CAT forklift, 3 pickups	144 pallets
26	Hwys 200 & 382 quarry along Flathead River	1 track excavator, 1 CAT forklift	66 pallets of 1" and 1"-2" sizes
27	Montana Rock Works (yard)	--	Pallet count: 1142 of all kinds
28	Montana Stone Supply (yard)	2 haul trucks, 2 trailers, 1 forklift, 2 backhoe, 1 cris-cutter	547 pallets of all types
29	Stone Central (Yard)	--	--
30	Unnamed quarry	1 forklift, 1 excavator	50 tons
31	Unnamed quarry	--	30 tons
32	Unnamed quarry hwy 382	1 track excavator, 1 CAT forklift	36 pallets of 1" and 1"-2" sizes
33	Feller zebra marble (DOGMs Black Hills)	1 flatbed trailer; 1 bobcat sized wheel loader; 1 pickup; 1 track hyd excavator	--
34	Marjum Pass Commun. Pit	Mechanized equipment permitted	None
35	Multi-colored Green Nos. 1-5/Pitchforth Springs	1 old truck; 1 trailer; 1 John Deere track loader JD 555; Gardner Denver compressor; 1 track excavator; 1 forklift	--
36	Red Lace Common Use	--	--
37	Rich Gulch-Black Rock crusher facility	1 D9 dozer; 1 14G grader; 1 wheel loader; 1 crusher st/ar200; 1 bin 30 ton; 1 track air drill; 5 conveyors 30", 22"; 1 conveyor 18"; 1 screen Varivibe II; 1 van; 1 300kw generator.	--
38	Rocanville/Wing JV Pit 1 (Tejon)	1 Komatsu wheel loader WA 250; 1 Komatsu D58E dozer; track air drill	60 bags of 1.5 tons each
39	Rocanville/Wing JV Pit 2 (Tejon)	--	64 pallets in pit 2;

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IDNo	Name	Sales_price	Market_description	Destination
17	Northern Stone--Top quarry	--	Load ourt 24 to 28 semi loads per week of 15-16 pallets each from entire operation; 3/4" stand-up flagstone is most popular because of large area coverage and represents most of shipments	--
18	Northern Stone--Upper south quarry	--	Load ourt 24 to 28 semi loads per week of 15-16 pallets each from entire operation; 3/4" stand-up flagstone is most popular because of large area coverage and represents most of shipments	--
19	Fish Creek	--	Ship to CA, AZ, DE, especially Las Vegas	Calif. (primary), Las Vegas, Delaware, Texas
20	Kavalla--B & M Stone	400-500/ton (retail)	--	--
21	State quarry--Kavalla Ridge	--	--	--
22	Kavalla Ridge--Robert Orr (pit 1)	--	--	--
23	Kavalla Ridge--Robert Orr (pit 2)	--	--	--
24	Kavalla Ridge--Robert Orr (pit 3)	--	--	--
25	Hot Springs quarry	150-250/ton (brochure)	--	California (loading truck when at site)
26	Hwys 200 & 382 quarry along Flathead River	--	--	--
27	Montana Rock Works (yard)	--	--	--
28	Montana Stone Supply (yard)	--	--	--
29	Stone Central (Yard)	--	--	--
30	Unnamed quarry	--	--	--
31	Unnamed quarry	--	--	--
32	Unnamed quarry hwy 382	--	--	--
33	Feller zebra marble (DOGMs Black Hills)	--	Used for aquarium stone	--
34	Marjum Pass Commun. Pit	--	--	--
35	Multi-colored Green Nos. 1-5/Pitchforth Springs	--	--	--
36	Red Lace Common Use	--	--	--
37	Rich Gulch-Black Rock crusher facility	--	--	--
38	Rocanville/Wing JV Pit 1 (Tejon)	Estimated @ $119/ton based on past reports to BLM	--	--
39	Rocanville/Wing JV Pit 2 (Tejon)	--	--	--

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IDNo	Name	Prod_1995	Prod_1996	Prod_1997	Prod_1998	Prod_1999	Prod_2000	Prod_2001	Prod_2002	Prod_2003	Prod_2004	Max_prod
17	Northern Stone--Top quarry											
18	Northern Stone--Upper south quarry											
19	Fish Creek										4000	4000
20	Kavalla--B & M Stone										1100	1100
21	State quarry--Kavalla Ridge											
22	Kavalla Ridge--Robert Orr (pit 1)											
23	Kavalla Ridge--Robert Orr (pit 2)											
24	Kavalla Ridge--Robert Orr (pit 3)											
25	Hot Springs quarry											
26	Hwys 200 & 382 quarry along Flathead River											
27	Montana Rock Works (yard)											
28	Montana Stone Supply (yard)											
29	Stone Central (Yard)											
30	Unnamed quarry											
31	Unnamed quarry											
32	Unnamed quarry hwy 382											
33	Feller zebra marble (DOGMs Black Hills)			147	0	32	14	123	27	50	140	140
34	Marjum Pass Commun. Pit											
35	Multi-colored Green Nos. 1-5/Pitchforth Springs		15	NR	7	6	10	30	30	30	90	90
36	Red Lace Common Use											
37	Rich Gulch-Black Rock crusher facility						0	NR	NR	NR	1200	1200
38	Rocanville/Wing JV Pit 1 (Tejon)						NR	NR	NR	NR	3000	3000
39	Rocanville/Wing JV Pit 2 (Tejon)						NR	NR	NR	NR		

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IDNo	Name	Comments
17	Northern Stone--Top quarry	--
18	Northern Stone--Upper south quarry	--
19	Fish Creek	--
20	Kavalla--B & M Stone	--
21	State quarry--Kavalla Ridge	State offered lease for 4000 tons for $20,000 total income; past production ~1000 tons
22	Kavalla Ridge--Robert Orr (pit 1)	--
23	Kavalla Ridge--Robert Orr (pit 2)	--
24	Kavalla Ridge--Robert Orr (pit 3)	--
25	Hot Springs quarry	--
26	Hwys 200 & 382 quarry along Flathead River	--
27	Montana Rock Works (yard)	--
28	Montana Stone Supply (yard)	--
29	Stone Central (Yard)	--
30	Unnamed quarry	--
31	Unnamed quarry	--
32	Unnamed quarry hwy 382	--
33	Feller zebra marble (DOGMs Black Hills)	--
34	Marjum Pass Commun. Pit	--
35	Multi-colored Green Nos. 1-5/Pitchforth Springs	--
36	Red Lace Common Use	--
37	Rich Gulch-Black Rock crusher facility	See production column (NR=not reported)
38	Rocanville/Wing JV Pit 1 (Tejon)	All pits combined
39	Rocanville/Wing JV Pit 2 (Tejon)	All pits combined

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IDNo	Name	Alt_Name	Location_State	Surface_Mgmt	Case_Type	Visited	Photos	Sampled	Date_Visit	Status
40	Rocanville/Wing JV Pit 3 (Tejon)	--	UT	Fillmore FO	Claims	Yes	Yes	Yes	May 28 2004	Active
41	Rocanville/Wing JV Pit 4 (Tejon)	--	UT	Fillmore FO	Claims	Yes	Yes	Yes	May 28 2004	Active
42	Spectrum quarry	--	UT	Fillmore FO	Claims	Yes	Yes	Yes	May 28 2004	Inactive
43	Spectrum-North pit	--	UT	Fillmore FO	Claims	Yes	Yes	Yes	May 28 2004	Inactive
44	White Tiger	--	UT	Fillmore FO	Community Pit	Yes	Yes	Yes	May 27 2004	Inactive
45	Corner Creek area	--	UT	Sawtooth NF	Material site	Yes	Yes	Yes	July 20 2004	Past producer
46	Dove Creek quarry, lower quarry (Clarks Basin)	Clarks Basin mobile	UT	Sawtooth NF	Claims	Yes	Yes	Yes	July 20 2004	Active
47	Dove Creek quarry, upper quarry (Clarks Basin)	Clarks Basin mobile	UT	Sawtooth NF	Claims	Yes	Yes	Yes	July 20 2004	Past producer
48	Interstate quarry	--	UT	Sawtooth NF	Claims	Yes	Yes	Yes	July 20 2004	Explored
49	Johnson Creek quarry	--	UT	Sawtooth NF	Claims	Yes	Yes	Yes	July 22 2004	Explored
50	Pine Springs	--	UT	Sawtooth NF	Claims	Yes	Yes	Yes	July 23 2004	Inactive
51	Shimmer Lady	--	UT	Sawtooth NF	Claims	Yes	Yes	Yes	July 20 2004	Raw
52	Vertical Cloud	--	UT	Sawtooth NF	Claims	Yes	Yes	Yes	July 20 2004	Raw
53	Chew Rock Quarry (Split Mountain)	Split Mountain	UT	Vernal FO	Claims	Yes	Yes	Yes	July 14 2004	Active
54	Cory Robison quarry	UTU 76168	UT	Vernal FO	Material site	Yes	Yes	Yes	July 12 2004	Active
55	Cory Robison quarry	UTU 76169	UT	Vernal FO	Material site	Yes	Yes	Yes	July 12 2004	Explored
56	Hechtle surface mine		UT	Vernal FO	Material site	Yes	Yes	Yes	July 13 2004	Inactive
57	Reese Jenson	UTU 076159	UT	Vernal FO	Material site	Yes	Yes	Yes	July 12 2004	Past producer

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IDNo	Name	Map_Name	Type_Site	Claim_Name	BLM_Case	SubTerra_Number	UT_DOGM_ID
40	Rocanville/Wing JV Pit 3 (Tejon)	Tule Valley	Quarry, Pit 3	--	UTU 079464	s270090	m270087
41	Rocanville/Wing JV Pit 4 (Tejon)	Tule Valley	Quarry, Pit 4	--	UTU 079464	s270090	m270087
42	Spectrum quarry	Tule Valley	Quarry	--	UTU 063420	s270079	s270079
43	Spectrum-North pit	Tule Valley	Quarry	--	UTU 063420		s270079
44	White Tiger	Wah Wah North	Quarry	--	UTU 078293	s270093	s270093
45	Corner Creek area	Dennis Hill 7.5	Quarry	--	--	s030029	s030029
46	Dove Creek quarry, lower quarry (Clarks Basin)	Lynn Reservoir 7.5	Quarry	--	--	s030016	s030016
47	Dove Creek quarry, upper quarry (Clarks Basin)	Lynn Reservoir 7.5	Quarry	--	--	--	--
48	Interstate quarry	Lynn Reservoir 7.5	Quarry	--	--	s030055	--
49	Johnson Creek quarry	Yost 7.5	Quarry	--	--	--	--
50	Pine Springs	Buck Hollow 7.5	Quarry	--	--	--	s030053
51	Shimmer Lady	Lynn Reservoir 7.5	Quarry, proposed	--	--	--	--
52	Vertical Cloud	Lynn Reservoir 7.5	Quarry, proposed	--	--	--	--
53	Chew Rock Quarry (Split Mountain)	Vernal	Quarry	--	UTU 066378	s470061	s470061
54	Cory Robison quarry	Price 100k	Surface collection only	--	UTU 076168	--	--
55	Cory Robison quarry	Price 100k	Surface collection only	--	UTU 076169	UTU 076170, UTU 076169	
56	Hechtle surface mine	Seep Ridge 100 k	Surface collection only	--	UTU 076177	UTU 076177	s010044
57	Reese Jenson	Price 100k	Surface collection only	--	UTU 076159	--	--

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IDNo	Name	UT_SITLA_ID	Data_Source	Operator_Name
40	Rocanville/Wing JV Pit 3 (Tejon)	--	Case file; UT DOGM	Rocanville Stone Corp., Mert Hamilton
41	Rocanville/Wing JV Pit 4 (Tejon)	--	Case file; UT DOGM	Rocanville Stone Corp., Mert Hamilton
42	Spectrum quarry	--	Case file; SubTerra (2004); UT DOGM	Cambrillic Stone
43	Spectrum-North pit	--	Case file; UT DOGM	Cambrillic Stone
44	White Tiger	--	Case file; SubTerra (2004)	Penney, Dave, Penney's Gemstones
45	Corner Creek area	--	Steve Flock, Sawtooth NF; SubTerra (2004); UT DOGM	Quartz Rock Co. James Peterson
46	Dove Creek quarry, lower quarry (Clarks Basin)	m030016	Steve Flock, Sawtooth NF, Bill Bown; UT DOGM; John Blake Utah SITLA	Bonneville quarries, Bill Bown owner
47	Dove Creek quarry, upper quarry (Clarks Basin)	--	Steve Flock, Sawtooth NF, Bill Bown	Bonneville quarries, Bill Bown owner
48	Interstate quarry	--	Steve Flock, Sawtooth NF; SubTerra (2004)	Interstate Rock
49	Johnson Creek quarry	--	Steve Flock, Sawtooth NF	
50	Pine Springs	--	Steve Flock, Sawtooth NF	Sagers, J., J Hechtle
51	Shimmer Lady	--	Steve Flock, Sawtooth NF	Sagers, J.
52	Vertical Cloud	--	Steve Flock, Sawtooth NF	Bonneville quarries, Bill Bown owner
53	Chew Rock Quarry (Split Mountain)	--	Pete Sokolosky, Vernal FO; SubTerra (2004); UT DOGM	Chew, Alan
54	Cory Robison quarry	--	Pete Sokolosky, Vernal FO	C and R Stone, Cory Robison
55	Cory Robison quarry	--	Pete Sokolosky, Vernal FO; SubTerra (2004)	C and R Stone, Cory Robison
56	Hechtle surface mine	--	Pete Sokolosky, Vernal FO; SubTerra (2004)	Stone Art Co. John Hechtle Orem UT
57	Reese Jenson	--	Pete Sokolosky, Vernal FO	Jenson, Reese

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IDNo	Name	Operator_Address	Operator_State	Operator_Tele	Location_Descr
40	Rocanville/Wing JV Pit 3 (Tejon)	PO Box 35 Delta UT	UT	435-8645244	North Canyon in House Range
41	Rocanville/Wing JV Pit 4 (Tejon)	PO Box 35 Delta UT	UT	435-8645245	North Canyon in House Range
42	Spectrum quarry	--	UT	--	Antelope Mtn., E. side of House Range
43	Spectrum-North pit	--	UT	--	Antelope Mtn., E. side of House Range
44	White Tiger	PO Box 312 Beaver UT 84713	UT	435-438-5522, 801-319-1727 cell	--
45	Corner Creek area	Clarkston, UT 84305 PO Box 298	UT	801-563-9086	3 mi. W. of Park Valley on Dove Cr. Rd.
46	Dove Creek quarry, lower quarry (Clarks Basin)	842 W 400 N W. Bountiful, UT 84087	UT	801-295-0601	Clarks Basin
47	Dove Creek quarry, upper quarry (Clarks Basin)	842 W 400 N W. Bountiful, UT 84087	UT	801-295-0601	Clarks Basin
48	Interstate quarry	Michael Pauletto 11204 NW 37th CT Vancouver, WA	WA	360-693-1478	W. part of Clarks Basin
49	Johnson Creek quarry	--	UT	--	5 mi on Johnson Creek FS access rd
50	Pine Springs	2016 S. Montana Av Provo	UT	801-977-0380	--
51	Shimmer Lady	2016 S. Montana Av Provo 84606	UT	801-977-0380	W. part of Clarks Basin
52	Vertical Cloud	842 W 400 N W. Bountiful, UT 84087	UT	801-295-0601	Clarks Basin
53	Chew Rock Quarry (Split Mountain)	PO Box 286 Jensen, UT 84035	UT	435-828-8886, 828-8883	Atop Blue Mountain
54	Cory Robison quarry	594 N 850 W, Provo	UT	801-356-1649	Upper pt. of Petes Canyon
55	Cory Robison quarry	594 N 850 W, Provo	UT	801-356-1649	Upper pt. of Petes Canyon
56	Hechtle surface mine	PO Box 35 Orem, UT 84057	UT	--	Agency Draw
57	Reese Jenson	HC 65 Box 730190, Talmage, UT 84073	UT	435-454-3074	W. of Gate Canyon

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IDNo	Name	Location_County	Tp	Rg	Sec&Sub	Lat_dd	Long_dd	UTM_E	UTM_N	UTM_Zone	Coll_Method
40	Rocanville/Wing JV Pit 3 (Tejon)	Millard	18 S	13 W	30+	39.2140	-113.3473	297345	4343150	12S	Recorded
41	Rocanville/Wing JV Pit 4 (Tejon)	Millard	18 S	13 W	30+	39.2157	-113.3395	298023	4343321	12S	Recorded
42	Spectrum quarry	Millard	17 S	13 W	23	39.3177	-113.2825	303230	4354517	12S	Recorded
43	Spectrum-North pit	Millard	17 S	13 W	14 cs1/2	39.3200	-113.2888	302694	4354786	12S	Recorded
44	White Tiger	Millard	25 S	15 W	10 nene, 11nwnw, 3 swsw	38.6596	-113.5083	281747	4281988	12S	Calculated from trs
45	Corner Creek area	Box Elder	13 N	15 W	23 swne	41.8382	-113.5288	290019	4634689	12T	Recorded
46	Dove Creek quarry, lower quarry (Clarks Basin)	Box Elder	13 N	16 W	14 nw	41.8515	-113.6513	279898	4636472	12T	Recorded
47	Dove Creek quarry, upper quarry (Clarks Basin)	Box Elder	13 N	16 W	14 Nw	41.8523	-113.6540	279683	4636583	12T	Recorded
48	Interstate quarry	Box Elder	13 N	16 W	13 nwne	41.8560	-113.6281	281838	4636907	12T	Recorded
49	Johnson Creek quarry	Box Elder	14 N	15 W	34 swne	41.8963	-113.5495	288496	4641198	12T	Recorded
50	Pine Springs	Box Elder	13 N	16 W	1 nwnw	41.8787	-113.6368	281192	4639466	12T	Recorded
51	Shimmer Lady	Box Elder	13 N	16 W	11 nese	41.8630	-113.6427	280657	4637738	12T	Recorded
52	Vertical Cloud	Box Elder	13 N	16 W	13 nwnw	41.8553	-113.6353	281237	4636865	12T	Recorded
53	Chew Rock Quarry (Split Mountain)	Uintah	5 S	25 E	9 cw1/2, 8 ce1/2	40.3990	-109.1138	660069	4473751	12T	Recorded
54	Cory Robison quarry	Duchesne	11 S	15 E	18 cne	39.8611	-110.2737	562150	4412383	12S	Recorded
55	Cory Robison quarry	Duchesne	11 S	14 E	12 se, 13 ne	39.8647	-110.2889	560821	4412778	12S	Recorded
56	Hechtle surface mine	Uintah	13 S	21 E	17 sw, 19 ne, 20 nw	39.6763	-109.6010	619988	4392567	12S	Recorded
57	Reese Jenson	Duchesne	11 S	15 E	17 cnw	39.8631	-110.2647	562887	4412624	12S	Recorded

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IDNo	Name	Color	Geology	Generalized_Rock_Unit
40	Rocanville/Wing JV Pit 3 (Tejon)	Medium gray	Weeks Form. (Cambrian)	Weeks_Camb
41	Rocanville/Wing JV Pit 4 (Tejon)	Light greenish gray	Weeks Form. (Cambrian)	Weeks_Camb
42	Spectrum quarry	Gray	Marjum Form. (Cambrian)	Marjum
43	Spectrum-North pit	Gray	Marjum Form. (Cambrian)	Marjum
44	White Tiger	White-Black	Notch Peak Form. (Cambrian)	NotchPeak_C
45	Corner Creek area	White	Elba Quartzite (pC)	ElbaQtz_pC
46	Dove Creek quarry, lower quarry (Clarks Basin)	White	Quartzite of Clarks Basin (Cambrian)	Qtzte_ClarksBasin
47	Dove Creek quarry, upper quarry (Clarks Basin)	White	Quartzite of Clarks Basin (Cambrian)	Qtzte_ClarksBasin
48	Interstate quarry	White	Quartzite of Clarks Basin (Cambrian)	Qtzte_ClarksBasin
49	Johnson Creek quarry	White	Schist of Stevens Spring (PreCambrian)	Schist_StevensSpring
50	Pine Springs	White	Quartzite of Clarks Basin (Cambrian)	Qtzte_ClarksBasin
51	Shimmer Lady	White	Quartzite of Clarks Basin (Cambrian)	Qtzte_ClarksBasin
52	Vertical Cloud	White	Quartzite of Clarks Basin (Cambrian)	Qtzte_ClarksBasin
53	Chew Rock Quarry (Split Mountain)	Light brown	Shinarump Cgl. Member	ShinarumpMbr
54	Cory Robison quarry	Buff	Upper Green River Form.	GreenRiver
55	Cory Robison quarry	Buff	Upper Green River Form.	GreenRiver
56	Hechtle surface mine	Light brown	Upper Green River Form.	GreenRiver
57	Reese Jenson	Light brown	Upper Green River Form.	GreenRiver

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Lithologic_Description	Generalized_Lithology
40	Rocanville/Wing JV Pit 3 (Tejon)	Limestone, shaley, silty mudstone, silty sandstone	Limestone
41	Rocanville/Wing JV Pit 4 (Tejon)	Limestone, shaley, silty mudstone, silty sandstone	Limestone
42	Spectrum quarry	Shale, fissile, disaggregates with weathering	Shale
43	Spectrum-North pit	Shale, fissile, dissaggregates with weathering	Shale
44	White Tiger	Marble, white-black "zebra", is 10% of material	Marble
45	Corner Creek area	Quartzite, flaggy white	Quartzite
46	Dove Creek quarry, lower quarry (Clarks Basin)	Quartzite, flaggy, white to light brown	Quartzite
47	Dove Creek quarry, upper quarry (Clarks Basin)	Quartzite, white, silvery, flaggy	Quartzite
48	Interstate quarry	Quartzite, white to gray, flaggy, with micaceous partings	Quartzite
49	Johnson Creek quarry	Quartzite, white, light green (lime), very hard, metamorphosed, with frew muscovite partings; often breaks into thin flagstone slabs	Quartzite
50	Pine Springs	Quartzite, white, with white and green micaceous stringers	Quartzite
51	Shimmer Lady	Quartzite, white, flaggy some with liesegang banding	Quartzite
52	Vertical Cloud	Quartzite, white, flaggy	Quartzite
53	Chew Rock Quarry (Split Mountain)	Sandstone, flaggy, light brown to buff in color	Sandstone
54	Cory Robison quarry	Sandstone, buff colored	Sandstone
55	Cory Robison quarry	Sandstone, buff and gray	Sandstone
56	Hechtle surface mine	Sandstone, buff, blocks 2 in x 6 in x 20 in or more	Sandstone
57	Reese Jenson	Sandstone, buff and gray	Sandstone

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Other_characteristics	Extraction_Fractures_Cleavability	Product_Dimension_Fractures_Cleavability
40	Rocanville/Wing JV Pit 3 (Tejon)	Large quantities of thin (1" thick) flagstone slabs	Favorable with respect to extraction	Favorable with respect to product dimensions.
41	Rocanville/Wing JV Pit 4 (Tejon)	Large quantities of thin (1" thick) flagstone slabs	Favorable with respect to extraction	Favorable with respect to product dimensions.
42	Spectrum quarry	Most notable feature was rapid disintegration of soft flagstone sheets; most sheets were so thin they had not strength	Favorable with respect to extraction	Unfavorable with respect to product dimensions
43	Spectrum-North pit	Most notable feature was rapid disintegration of soft flagstone sheets; most sheets were so thin they had not strength	Favorable with respect to extraction	Unfavorable with respect to product dimensions
44	White Tiger	--	Not Applicable.	Unfavorable with respect to product dimensions
45	Corner Creek area	Rock is hard and durable	Favorable with respect to extraction	Unfavorable with respect to product dimensions
46	Dove Creek quarry, lower quarry (Clarks Basin)	Quartzite forms partings 1/2"-2" apart; white color with silvery luster; splits along micaceous planes 1/2"-2" thick; mica on planes give silvery luster	Favorable with respect to extraction	Favorable with respect to product dimensions.
47	Dove Creek quarry, upper quarry (Clarks Basin)	Splits along micaceous planes into into 1"-1.5" thick plates; hard and durable quartzite; white to light gray to brown in color; silvery luster due to micas along partings	Favorable with respect to extraction	Favorable with respect to product dimensions.
48	Interstate quarry	Splits along micaceous planes into into 1"-1.5" thick plates; hard and durable quartzite; white to light gray in color	Favorable with respect to extraction	Favorable with respect to product dimensions.
49	Johnson Creek quarry	Pure white, quartzite, slight light lime green color; partings along bedding planes; highly vitreous luster	Favorable with respect to extraction	Unfavorable with respect to product dimensions
50	Pine Springs	White quartzite, with few white mica and green Cr-mica strings; very hard, durable; breaks along partings into 1"-2" plates	Favorable with respect to extraction	Unfavorable with respect to product dimensions
51	Shimmer Lady	Splits into thin 3/4"-2" sheets along micaceous cleavages; Hard and durable; white to very light gray color	Favorable with respect to extraction	Favorable with respect to product dimensions.
52	Vertical Cloud	Rock splits along planes 3/4" bounded by micaceous layer; white to light gray in color; hard and durable	Favorable with respect to extraction	Favorable with respect to product dimensions.
53	Chew Rock Quarry (Split Mountain)	--	Favorable with respect to extraction	Favorable with respect to product dimensions.
54	Cory Robison quarry	--	Not Applicable.	Not applicable
55	Cory Robison quarry	--	Not Applicable.	Not applicable
56	Hechtle surface mine	--	Favorable with respect to extraction	Favorable with respect to product dimensions.
57	Reese Jenson	--	Favorable with respect to extraction	Favorable with respect to product dimensions.

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Influence_of_Texture	Uniform_Thickness	Lithology_Hardness_Durability	Rock_Quality_Suitability
40	Rocanville/Wing JV Pit 3 (Tejon)	Likely influence	Yes	Advantageous	Varieties of flagstone removed from several small pits
41	Rocanville/Wing JV Pit 4 (Tejon)	Likely influence	Yes	Advantageous	Varieties of flagstone removed from several small pits
42	Spectrum quarry	No Influence	Yes	Disadvantageous	Friable nature and thinness of partings of shale leads to unfavorable product that rapidly deteriorates by weathering
43	Spectrum-North pit	No Influence	No	Disadvantageous	Friable nature and thinness of partings of shale leads to unfavorable product that rapidly deteriorates by weathering
44	White Tiger	No Influence	No	Advantageous	Durable rock for landscape
45	Corner Creek area	Likely influence	No	Advantageous	Good to excellent
46	Dove Creek quarry, lower quarry (Clarks Basin)	Likely influence	Yes	Advantageous	Fissile, splits into flagstone
47	Dove Creek quarry, upper quarry (Clarks Basin)	Likely influence	Yes	Advantageous	Fissile, splits into flagstone
48	Interstate quarry	Likely influence	Yes	Advantageous	Fissile, splits into flagstone
49	Johnson Creek quarry	Likely influence	No	Advantageous	Fair to good; green coloration
50	Pine Springs	Likely influence	No	Advantageous	Fair to good; green coloration
51	Shimmer Lady	Likely influence	Yes	Advantageous	Fissile, splits into flagstone
52	Vertical Cloud	Likely influence	Yes	Advantageous	Fissile, splits into flagstone
53	Chew Rock Quarry (Split Mountain)	No Influence	No	Advantageous	High durability for building stone & flagstone
54	Cory Robison quarry	Likely influence	Yes	Advantageous	Good quality; limited supply after surface rock is removed
55	Cory Robison quarry	Likely influence	Yes	Advantageous	Good quality; limited supply after surface rock is removed
56	Hechtle surface mine	No Influence	Yes	Advantageous	Good to excellent quality; hard, durable sandstone
57	Reese Jenson	No Influence	Yes	Advantageous	Good quality; hard, durable sandstone

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Size	Ease_of_Extraction	Extent_of_Deposit	Reserve_Limits_Overburden
40	Rocanville/Wing JV Pit 3 (Tejon)	Large	Very easy (no mechanized equipment required, although it might be used)	Extended	Several thousand tons in mine area, large adjacent undeveloped reserves.
41	Rocanville/Wing JV Pit 4 (Tejon)	Large	Very easy (no mechanized equipment required, although it might be used)	Extended	Several thousand tons in mine area, large adjacent undeveloped reserves.
42	Spectrum quarry	Medium	Very easy (no mechanized equipment required, although it might be used)	Extended	Several thousand tons in mine area, large adjacent undeveloped reserves.
43	Spectrum-North pit	Small	Very easy (no mechanized equipment required, although it might be used)	Extended	Several thousand tons in mine area, large adjacent undeveloped reserves.
44	White Tiger	Small-Material site	Difficult (blasting required under confined or otherwise difficult conditions).	Limited or Confined	Unknown reserve
45	Corner Creek area	Medium-Material site	Moderately easy	Extended	Limited overburden; reserve unknown
46	Dove Creek quarry, lower quarry (Clarks Basin)	Large	Moderately difficult (blasting likely required, or extraction otherwise made difficult through extensive overburden, unfavorable structure, etc.)	Extended	Limited, discontinuous minable areas
47	Dove Creek quarry, upper quarry (Clarks Basin)	Medium	Moderately difficult (blasting likely required, or extraction otherwise made difficult through extensive overburden, unfavorable structure, etc.)	Extended	Limited, discontinuous minable areas
48	Interstate quarry	Small	Moderately difficult (blasting likely required, or extraction otherwise made difficult through extensive overburden, unfavorable structure, etc.)	Extended	Limited, discontinuous minable areas
49	Johnson Creek quarry	Small	Moderately difficult (blasting likely required, or extraction otherwise made difficult through extensive overburden, unfavorable structure, etc.)	Limited or Confined	Unknown reserve
50	Pine Springs	Small	Moderately difficult (blasting likely required, or extraction otherwise made difficult through extensive overburden, unfavorable structure, etc.)	Limited or Confined	Unknown reserve
51	Shimmer Lady	Small	Moderately difficult (blasting likely required, or extraction otherwise made difficult through extensive overburden, unfavorable structure, etc.)	Extended	Limited, discontinuous minable areas
52	Vertical Cloud	Small	Moderately difficult (blasting likely required, or extraction otherwise made difficult through extensive overburden, unfavorable structure, etc.)	Extended	Limited, discontinuous minable areas
53	Chew Rock Quarry (Split Mountain)	Large	Moderately easy (extraction by ripping)	Extended	Unknown reserve
54	Cory Robison quarry	Medium-Material site	Very easy (no mechanized equipment required, although it might be used)	Limited or Confined	Reserve unknown; overburden none as collected from surface
55	Cory Robison quarry	Small	Very easy (no mechanized equipment required, although it might be used)	Limited or Confined	Reserve unknown; overburden none as collected from surface
56	Hechtle surface mine	Small	Very easy (no mechanized equipment required, although it might be used)	Extended	Reserve large, but unknown
57	Reese Jenson	Small	Very easy (no mechanized equipment required, although it might be used)	Limited or Confined	Reserve small, but area large; stone is sparsely scattered; only surface removal is allowed

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Number_Products	Known_Products	Acres	Mining_Method	Hand_Methods
40	Rocanville/Wing JV Pit 3 (Tejon)	Large (>5 products)	Flagstone of various composition, colors and thickness	--	Hand only	Hand split, sort
41	Rocanville/Wing JV Pit 4 (Tejon)	Large (>5 products)	Flagstone of various composition, colors and thickness	--	Hand only	Hand split, sort
42	Spectrum quarry	Small (1 - 2 products)	Flaggy shale; total production - 3,773 tons	--	Hand-mechanized combined	Hand split, sort
43	Spectrum-North pit	Small (1 - 2 products)	Shale flagstone	<1	Hand-mechanized combined	Hand split, sort
44	White Tiger	Small (1 - 2 products)	Black and white-banded "zebra" marble; landscape (?) rock	2	Mechanized	None
45	Corner Creek area	Small (1 - 2 products)	Flagstone, random blocks	2	Hand-mechanized combined	Hand split, sort
46	Dove Creek quarry, lower quarry (Clarks Basin)	Medium (3-5 products)	Flagstone, random blocks	5	Hand-mechanized combined	Hand split, sort
47	Dove Creek quarry, upper quarry (Clarks Basin)	Medium (3-5 products)	Flagstone, random blocks	1	Hand-mechanized combined	Hand split, sort
48	Interstate quarry	Medium (3-5 products)	Flagstone, random blocks	--	Hand-mechanized combined	Hand split, sort
49	Johnson Creek quarry	Small (1 - 2 products)	Random blocks, slabs, minor flagstone	--	Hand-mechanized combined	Hand split, sort
50	Pine Springs	Small (1 - 2 products)	Quartzite flagstone and blocks	0.5	Hand-mechanized combined	Hand split, sort
51	Shimmer Lady	Medium (3-5 products)	Quartzite flagstone; random blocks	0.5	Hand-mechanized combined	Hand split, sort
52	Vertical Cloud	Medium (3-5 products)	Flagstone, random blocks	--	Hand-mechanized combined	Hand split, sort
53	Chew Rock Quarry (Split Mountain)	Medium (3-5 products)	Large blocks for dimension stone cut to custom size; flagstone 1/4"-3"	5	Hand-mechanized combined	Hand split, sort
54	Cory Robison quarry	Small (1 - 2 products)	Flagstone, large blocks	40	Hand only	Surface collection
55	Cory Robison quarry	Small (1 - 2 products)	Flagstone, large blocks	95	Hand only	Surface collection
56	Hechtle surface mine	Small (1 - 2 products)	Curbstone, boulders, random blocks	240	Hand only	Surface collection
57	Reese Jenson	Small (1 - 2 products)	Flagstone; random slabs	80	Hand only	Surface collection

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IDNo	Name	Mining_Description	Production_rate
40	Rocanville/Wing JV Pit 3 (Tejon)	Drill, blast, dig with excavator and move rock to splitters work area	--
41	Rocanville/Wing JV Pit 4 (Tejon)	Drill, blast, dig with excavator and move rock to splitters work area	--
42	Spectrum quarry	Uncover with dozer, loosen with wheel loader, hand sort and palletize	--
43	Spectrum-North pit	Uncover with dozer; hand sort	--
44	White Tiger	Dislodge and load with hyd excavator; hand select	3-10 tons in 3 yrs
45	Corner Creek area	Remove with backhoe; split and sort by hand	--
46	Dove Creek quarry, lower quarry (Clarks Basin)	Remove overburden with track excavator; drill and blast overburden and remove top 5 ft as waste; drill and blast usable rock; load with track excavator and haul to nearby splitting work area; hand sort and palletize	From combined Clarks Basin operations, B. Bown said 4000 tons/yr; another employee says 1 to 2 semi truck loads per week x 16 pallets/load x2 tons/pallets = 1.5x16x2 = 48 tons / week
47	Dove Creek quarry, upper quarry (Clarks Basin)	--	From combined Clarks Basin operations, B. Bown said 4000 tons/yr; another employee says 1 to 2 semi truck loads per week x 16 pallets/load x2 tons/pallets = 1.5x16x2 = 48 tons / week
48	Interstate quarry	Dozer to remove overburden and topsoil; not other work done at time shutdown; shutdown due to Forest Service trespass notice.	--
49	Johnson Creek quarry	--	--
50	Pine Springs	Dozer	--
51	Shimmer Lady	--	--
52	Vertical Cloud	Probably will be same as Dove Creek (Clarks Basin) owned by Bown	--
53	Chew Rock Quarry (Split Mountain)	Remove by hand and with forklift	100-120 tons/hr; but 300 tons in 2001 prior to 9/11 bombing; 1/2-1 ton/yr to local sculptor
54	Cory Robison quarry	Surface collection only; no surface improvements or excavations	200 ton/yr aver.
55	Cory Robison quarry	Surface collection only; no surface improvements or excavations	--
56	Hechtle surface mine	Surface collection only	11,600 lbs/load per day; 34,800 lbs for period Oct2003-Jun2004; averages approx. 44 tons/yr
57	Reese Jenson	Surface collection only; reclamation is pending at this time	--

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Processing_onsite	Work_schedule	Personnel	Buildings
40	Rocanville/Wing JV Pit 3 (Tejon)	--	--	--	--
41	Rocanville/Wing JV Pit 4 (Tejon)	--	--	--	--
42	Spectrum quarry	--	--	--	--
43	Spectrum-North pit	--	--	--	--
44	White Tiger	Hand select	--	1 laborer does all	--
45	Corner Creek area	--	Unknown	2 laborers; 1 owner; not on site at time of visit	--
46	Dove Creek quarry, lower quarry (Clarks Basin)	Hand select	May 15-Nov 1; 6 d/week	14 laborers, 1 operator, 1 boss; 4-man contract drill and blast crew spent little time on the site	--
47	Dove Creek quarry, upper quarry (Clarks Basin)	--	--	--	--
48	Interstate quarry	--	--	--	--
49	Johnson Creek quarry	--	--	--	--
50	Pine Springs	--	--	--	--
51	Shimmer Lady	--	--	--	--
52	Vertical Cloud	--	--	--	--
53	Chew Rock Quarry (Split Mountain)	Does custom work, cutting to dimension, polishing	As orders demand; irregular basis	Owner and son	--
54	Cory Robison quarry	--	--	1 owner, 2 laborers, but up to 5 laborers	--
55	Cory Robison quarry	--	--	1 owner, 2 laborers, but up to 5 laborers	--
56	Hechtle surface mine	--	--	1 laborer; 1 owner	--
57	Reese Jenson	--	--	2 to 4 laborers	--

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IDNo	Name	Equipment	Product_inventory
40	Rocanville/Wing JV Pit 3 (Tejon)	--	26 pallets in pit 3;
41	Rocanville/Wing JV Pit 4 (Tejon)	--	158 pallets in pit 4
42	Spectrum quarry	Dozer, wheel loader, transport truck	--
43	Spectrum-North pit	--	--
44	White Tiger	Track excavator; transport truck	--
45	Corner Creek area	1 track backhoe; 1 pickup truck	None
46	Dove Creek quarry, lower quarry (Clarks Basin)	2 track excavator; 1 wheel loader; 1 dump truck 15-ton; 1 flatbed w/ semi; 1-ton and 3/4 ton pickups; contractor equip.: 1-ton pickup; 1 airtrack drill w/compressor; 1 flatbed for drill	26 pallets at site; 14, 3" flagstone; 12, 1" upright flagstone; misc. blocks of quartzite; 5 grades of rock marketed
47	Dove Creek quarry, upper quarry (Clarks Basin)	--	--
48	Interstate quarry	--	--
49	Johnson Creek quarry	--	--
50	Pine Springs	--	None
51	Shimmer Lady	--	--
52	Vertical Cloud	--	--
53	Chew Rock Quarry (Split Mountain)	1, Cat 35H forklift; 1 semi truck w/flatbed; 1, bobcat size loader; 1 cris cutter for cutting rock	--
54	Cory Robison quarry	3/4 tons or 1-ton trucks; transfer to larger haul truck at gravel road--1984 Chev 1-ton, 1975 2-ton dump, 2001 Dodge 1-ton, 1997 Ford F350, 1990 Ford F350, 2001 Ford F350	--
55	Cory Robison quarry		--
56	Hechtle surface mine	1 Ford F350 HD PU with extended flatbed trailer; 1975 Ford crane truck	--
57	Reese Jenson	1 ton-trucks to haul to road and transfer to flatbed trailer	--

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IDNo	Name	Sales_price	Market_description	Destination
40	Rocanville/Wing JV Pit 3 (Tejon)	--	--	--
41	Rocanville/Wing JV Pit 4 (Tejon)	--	--	--
42	Spectrum quarry	$110/ton wholesale (M.Jackson report)	--	--
43	Spectrum-North pit	--	--	--
44	White Tiger	--	Aquarium rock; sculpting	--
45	Corner Creek area	Purchased 70 tons @$10/ton in 2004	Flagstone for specialty uses	--
46	Dove Creek quarry, lower quarry (Clarks Basin)	$90/ton for ledgestone (lowest price of Bown operations)	Hawaii; others to broker who sells throughout US	--
47	Dove Creek quarry, upper quarry (Clarks Basin)	--	--	--
48	Interstate quarry	--	--	--
49	Johnson Creek quarry	--	--	--
50	Pine Springs	--	--	--
51	Shimmer Lady	--	--	--
52	Vertical Cloud	--	--	--
53	Chew Rock Quarry (Split Mountain)	Flagstone: $150/t for 2.5"+; $175 for 1.5-2.5"; Large blocks: $240/t for <8sq ft/stone; $300/t for >8sq ft/stone ; custom prices for hearth and capp stones, polished, and diimension stones	Sales: local area; custom jobs; Steamboat Sprs, Aspen, Colo; Quality stone, Salt Lake	--
54	Cory Robison quarry	$35.51/t royalty; <600 tons, 3-year contract	--	--
55	Cory Robison quarry	$32.51/ton royalty for <800 tons, 3-year contract	--	--
56	Hechtle surface mine	$20.5/t royalty for <220 tons; expires 2008	--	Hauled to Orem
57	Reese Jenson	$11/ton royalty, <300 tons through 2002	--	--

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Prod_1995	Prod_1996	Prod_1997	Prod_1998	Prod_1999	Prod_2000	Prod_2001	Prod_2002	Prod_2003	Prod_2004	Max_prod
40	Rocanville/Wing JV Pit 3 (Tejon)						NR	NR	NR	NR		
41	Rocanville/Wing JV Pit 4 (Tejon)						NR	NR	NR	NR		
42	Spectrum quarry					0	0	0.5	0.5	0.5	0.5	0.5
43	Spectrum-North pit											
44	White Tiger							0	20	1	20	20
45	Corner Creek area			0	25	203	479	143	139	37	156	479
46	Dove Creek quarry, lower quarry (Clarks Basin)		1400	757	1800	831	1459	1600	1551	1525	3000	3000
47	Dove Creek quarry, upper quarry (Clarks Basin)											
48	Interstate quarry											
49	Johnson Creek quarry											
50	Pine Springs								0			
51	Shimmer Lady										0	
52	Vertical Cloud											
53	Chew Rock Quarry (Split Mountain)			140	705	1953	2237	3846	350	150	120	3846
54	Cory Robison quarry								155			155
55	Cory Robison quarry											
56	Hechtle surface mine				18	8	0	0	200	48	126	200
57	Reese Jenson					36.16	148.48	123.18				148.48

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IDNo	Name	Comments
40	Rocanville/Wing JV Pit 3 (Tejon)	All pits combined
41	Rocanville/Wing JV Pit 4 (Tejon)	All pits combined
42	Spectrum quarry	Common Var deter report by Michael Jackson, 1992
43	Spectrum-North pit	--
44	White Tiger	--
45	Corner Creek area	Not operated between 1995 and 2004; first leased in 1960s
46	Dove Creek quarry, lower quarry (Clarks Basin)	Drilling of 4.5-in holes on 4' centers to 9 ft depth for blastholes; Bill Bown says $45/ton profit
47	Dove Creek quarry, upper quarry (Clarks Basin)	No production
48	Interstate quarry	No Data
49	Johnson Creek quarry	--
50	Pine Springs	--
51	Shimmer Lady	No data
52	Vertical Cloud	--
53	Chew Rock Quarry (Split Mountain)	--
54	Cory Robison quarry	No data
55	Cory Robison quarry	No data
56	Hechtle surface mine	--
57	Reese Jenson	--

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IDNo	Name	Alt_Name	Location_State	Surface_Mgmt	Case_Type	Visited	Photos	Sampled	Date_Visit	Status
58	Reese Jenson-Fairbank-area 1	UTU076162	UT	Vernal FO	Material site	Yes	Yes	Yes	July 13 2004	Inactive
59	Reese Jenson-Fairbank-area 2	UTU076162	UT	Vernal FO	Material site	Yes	Yes	Yes	July 13 2004	Inactive
60	Rock-It Stone Works (Yard)	--	UT	Private	Private	Yes	Yes	No	July 14 2004	Active
61	Seep Ridge common use	Buck Canyon	UT	Vernal FO	Common use	Yes	Yes	Yes	July 13 2004	Inactive
62	United Stone	--	UT	State of Utah lease	State of Utah lease	Yes	Yes	Yes	July 13 2004	Active
63	United Stone (Abblecio Jiron #3)	Abblecia Jiron #3	UT	State of Utah lease	State of Utah lease	No	No	No	July 12 2004	Explored
64	Unknown	John Hechtle	UT	Vernal FO	Material site	Yes	Yes	Yes	July 13 2004	Active
65	Bangs Mountain	--	WA	Okanogan NF	Material site	Yes	Yes	Yes	Sep 1 2004	Inactive
66	Black Star	--	WA	Okanogan NF	Claims	Yes	Yes	Yes	Sep 1 2004	Explored
67	Bead Lake quarry	--	WA	Private	Private	Yes	Yes	Yes	Sep 2 2004	Active
68	Columbia Quartzite (Pit 1 and yard)	--	WA	Private	Private	Yes	Yes	Yes	Sep 2 2005	Active
69	Columbia Quartzite (Pit 2)	--	WA	Private	Private	Yes	Yes	Yes	Sep 2 2004	Active
70	Lloyd Logging rip rap	--	WA	Private	Private	Yes	Yes	Yes	Sep 1 2004	Active
71	Tollefson rip rap	--	WA	Private	Private	Yes	Yes	Yes	Sep 1 2004	Active
72	Cougar Mountain (sec. 8 unnamed)	--	WA	Private	Private	Yes	Yes	Yes	Oct 6 2004	Active
73	FS Rd 132-Flatrock	--	WA	Okanogan NF	Claims	Yes	Yes	Yes	Oct 6 2004	Inactive
74	Unknown Sec. 9	--	WA	Okanogan NF	Claims	Yes	Yes	Yes	Oct 6 2004	Inactive
75	Bacon rock quarry	--	UT	Monticello FO	Claims	Yes	Yes	Yes	Oct 10 2004	Inactive
76	Boundary quarry community pit	--	UT	Kanab FO	Community Pit	Yes	Yes	Yes	Oct 18 2004	Active
77	Bitter Seep quarry community pit	--	AZ	St George FO-Ariz. Strip	Community Pit	Yes	Yes	Yes	Oct 18 2004	Active
78	Moenkopi Moca pit/plant	--	UT	State of Utah lease	State of Utah lease	Yes	Yes	No	Oct 18 2004	Active
79	Shinarump quarry community pit	--	UT	Kanab FO	Community Pit	Yes	Yes	Yes	Oct 18 2004	Active
80	Alton #1 aggregate pit	--	UT	Kanab FO	Material site	No	No	Yes	Oct 18 2004	Active
81	Sink Valley Community pit	--	UT	Kanab FO	Material site	Yes	Yes	Yes	Oct 18 2004	Active

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Map_Name	Type_Site	Claim_Name	BLM_Case	SubTerra_Number	UT_DOGM_ID
58	Reese Jenson-Fairbank-area 1	Seep Ridge 100 k	Surface collection only	--	UTU 076162	--	s470075
59	Reese Jenson-Fairbank-area 2	Seep Ridge 100 k	Surface collection only	--	UTU 076162	UTU 076172	s470075
60	Rock-It Stone Works (Yard)	Duchesne 100 k	Yard	--	--	--	--
61	Seep Ridge common use	Seep Ridge 100 k	Surface collection only	--	UTU 076097	--	--
62	United Stone	Seep Ridge 100 k	Surface Collection only	--	--	s470074	s470074
63	United Stone (Abblecio Jiron #3)	Price 100 k	Surface collection only	--	--	s130005	s0470069, s0470070, s130005
64	Unknown	Seep Ridge 100 k	Surface Collection only	--	UTU 076180	--	--
65	Bangs Mountain	Okanogan WA 100 k	Quarry, reclaimed	--	--	--	--
66	Black Star	Okanogan WA 100 k	Quarry	--	--	--	--
67	Bead Lake quarry	Sandpoint WA-ID 100 k	Quarry and yard	--	--	--	--
68	Columbia Quartzite (Pit 1 and yard)	Okanogan WA 100 k	Quarry and yard	--	--	--	--
69	Columbia Quartzite (Pit 2)	Okanogan WA 100 k	Quarry	--	--	--	--
70	Lloyd Logging rip rap	Concrete WA 100 k	Quarry	--	--	--	--
71	Tollefson rip rap	Okanogan WA 100 k	Quarry	--	--	--	--
72	Cougar Mountain (sec. 8 unnamed)	Chewelah 100K	Quarry	--	--	--	--
73	FS Rd 132-Flatrock	Chewelah 100K	Quarry	Flatrock	--	--	--
74	Unknown Sec. 9	Chewelah 100K	Quarry	Flatrock		--	--
75	Bacon rock quarry	Bluff 100k	Quarry	--	--	s370101	s370101
76	Boundary quarry community pit	Panguitch 100k	Quarry	--	UTU 077258	UTU 077258	--
77	Bitter Seep quarry community pit	Fredonia 100k	Quarry	--	--	--	--
78	Moenkopi Moca pit/plant	Kanab 100k	Quarry	--	--	s250021	s250021
79	Shinarump quarry community pit	Kanab 100k	Quarry	--	UTU 068551	UTU 068551	--
80	Alton #1 aggregate pit	Kanab 100k	Quarry	--	UTU 067818	UTU 067818	--
81	Sink Valley Community pit	Kanab 100k	Quarry	--	UTU 074766	UTU 74766	--

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	UT_SITLA_ID	Data_Source	Operator_Name
58	Reese Jenson-Fairbank-area 1	--	Pete Sokolosky, Vernal FO; UT DOGM	Jenson, Reese
59	Reese Jenson-Fairbank-area 2	--	Pete Sokolosky, Vernal FO; SubTerra (2004); UT DOGM	Jenson, Reese
60	Rock-It Stone Works (Yard)	--	Pete Sokolosky, Vernal FO	Rock-It Stone Works
61	Seep Ridge common use	--	Pete Sokolosky, Vernal FO	Bureau of Land Management
62	United Stone	--	Pete Sokolosky, Vernal FO; SubTerra (2004); UT DOGM	United Stone PO Box 909 500 W 59 N Duchesne UT 84021 Justin Farley
63	United Stone (Abblecio Jiron #3)	ML 48973OBA (United) & 48240 MP (B. Eskelson)	Pete Sokolosky, Vernal FO; SubTerra (2004); John Blake Utah SITLA	United Stone PO Box 909 500 W 59 N Duchesne UT 84021 Justin Farley
64	Unknown	--	Pete Sokolosky, Vernal FO	Hechtle, John, PO Box 35 Orem, UT
65	Bangs Mountain	--	Rod Lentz, Okanogan NF	Bureau of Land Management
66	Black Star	--	Rod Lentz, Okanogan NF	Vines, J.
67	Bead Lake quarry	--	On-site personnel; Rod Lentz, Okanogan NF	Montana Rock Products, Chip Bergeront; Jerry Cates, Interstate Rock, Vancouver, WA
68	Columbia Quartzite (Pit 1 and yard)	--	Joe Vines, owner	Columbia Quartzite
69	Columbia Quartzite (Pit 2)	--	Joe Vines, owner	Columbia Quartzite
70	Lloyd Logging rip rap	--	Bob Lloyd, owner	Lloyd Logging
71	Tollefson rip rap	--	Rod Lentz, Okanogan NF	Tollefson Construction
72	Cougar Mountain (sec. 8 unnamed)	--	Jesse Schacher, owner	Cougar Mountain
73	FS Rd 132-Flatrock	--	Rod Lentz, Okanogan NF	Remick, Lee, Tualatin, OR
74	Unknown Sec. 9	--	Rod Lentz, Okanogan NF	Remick, Lee, Tualatin, OR
75	Bacon rock quarry	--	Al (Eldon) Virgil, owner; SubTerra (2004); UT DOGM	Bedrock Stone and Art
76	Boundary quarry community pit	--	Philip Levin, owner; SubTerra (2004)	Levin, Philip, 707 Double A Ranch Rd.
77	Bitter Seep quarry community pit	--	Doug Powell, Kanab FO; Rick Rymerson, St George FO	Bureau of Land Management
78	Moenkopi Moca pit/plant	ML 47138	Noal Hansen, co-owner; Bruce Hansen; SubTerra (2004); UT DOGM; John Blake Utah SITLA	Hansen, Bruce Stone quarries
79	Shinarump quarry community pit	--	Doug Powell, Kanab FO; SubTerra (2004)	Wild Child Landscape and Supply, Griz, owner
80	Alton #1 aggregate pit	--	Doug Powell, Kanab FO; SubTerra (2004)	Bureau of Land Management
81	Sink Valley Community pit	--	Dennis MacDonald, Kanab, UT; SubTerra (2004)	MacDonald, Dennis, Kanab, UT

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Operator_Address	Operator_State	Operator_Tele	Location_Descr
58	Reese Jenson-Fairbank-area 1	HC 65 Box 730190, Talmage, UT 84073	UT	435-454-3074	Johnson Draw area
59	Reese Jenson-Fairbank-area 2	HC 65 Box 730190, Talmage, UT 84073	UT	435-454-3074	Johnson Draw area
60	Rock-It Stone Works (Yard)	Duchesne	UT	435-671-0757 cell Heber UT	east side of town, south of Hwy (look for sign)
61	Seep Ridge common use	--	UT		Seep Ridge area
62	United Stone	PO Box 909 Duchesne UT 84023	UT	435-738-2366, 822-5145 cell	--
63	United Stone (Abblecio Jiron #3)	PO Box 909 Duchesne UT 84022	UT	435-738-2366, 822-5145 cell	E. of Gate Canyon
64	Unknown	PO Box 35 Orem, UT 84057	UT	--	Johnson Draw area
65	Bangs Mountain	--	WA	--	12 mi E. of Sherman Pass on Hwy 20, then 5 mi S. on Bangs Mtn road
66	Black Star	Kettle Falls	WA	--	6 mi E. of Sherman Pass on Hwy 20, then S 3.1 mi on Fritz Cr FS road 400
67	Bead Lake quarry	Polson, MT	MT	406-261-8284	1/4 mi W. of No Name Lake
68	Columbia Quartzite (Pit 1 and yard)	Kettle Falls	WA	--	2 mi W of Kettle Falls on Hwy 395; then 1/4 mi West on Kifer Rd. (Pit 1)
69	Columbia Quartzite (Pit 2)	Kettle Falls	WA	--	2 mi W of Kettle Falls on Hwy 395; then 1/4 mi West on Kifer Rd. (Pit 2)
70	Lloyd Logging rip rap	Twisp	WA	--	1/2 mi N. of north side of Pearrygin Lake
71	Tollefson rip rap	Okanogan	WA	--	4 mi S. of Okanogan on Hwy Alt. 97
72	Cougar Mountain (sec. 8 unnamed)	Oldtown, ID	ID	509-671-2605	1 mi SW of Bead Lake
73	FS Rd 132-Flatrock	Tualatin	OR	Unknown	1 mi SW of Bead Lake
74	Unknown Sec. 9	Tualatin	OR	Unknown	1 mi SW of Bead Lake
75	Bacon rock quarry	1033 N Grayson Parkway Blanding, UT 84511	UT	435-678-3055	15 mi S. of Blanding (Hwy 191), 8 mi E on Hwy 262, 2 mi. N on section line road, then 1.5 mi NE on undevel road
76	Boundary quarry community pit	Ash Fork AZ	AZ	928-637-2288	8 mi N. of Panguitch and 2 mi W of Hwy 89
77	Bitter Seep quarry community pit	--	--	--	15 mi SW on Alt 89, then 8 mi S. on Grand Canyon Rd
78	Moenkopi Moca pit/plant	PO Box 341 Kanab, UT 84741	UT	435-644-3073	15 mi E. of Kanab UT
79	Shinarump quarry community pit	Kanab	UT	435-689-0521	12 mi E. of Kanab, UT
80	Alton #1 aggregate pit	--	UT	--	2 mi S of Alton, UT and 1.5 mi W. of highway
81	Sink Valley Community pit	Kanab	UT	435-644-5556	5 mi S. of Alton and 1.2 mi W of highway

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Location_County	Tp	Rg	Sec&Sub	Lat_dd	Long_dd	UTM_E	UTM_N	UTM_Zone	Coll_Method
58	Reese Jenson-Fairbank-area 1	Uintah	12 S	20 E	31 n1/2, 30 sw	39.7316	-109.7295	608873	4398543	12S	Recorded
59	Reese Jenson-Fairbank-area 2	Uintah	12 S	20 E	31 n1/2, 30 sw	39.7324	-109.7190	609780	4398631	12S	Recorded
60	Rock-It Stone Works (Yard)	Uintah	4 S	5 W	3 Uintah Mer.	40.1598	-110.3920	551780	4445675	12T	Modified
61	Seep Ridge common use	Uintah	12 S	21 E	35	39.7313	-109.5287	626089	4398781	12S	Recorded
62	United Stone	Uintah	12 S	20 E	32 csw	39.7268	-109.7095	610594	4398032	12S	Recorded
63	United Stone (Abblecio Jiron #3)	Duchesne	11 S	15 E	16 sw, 21nwnw	39.8607	-110.2442	564646	4412569	12S	Recorded
64	Unknown	Uintah	12 S	20 E	34 ne	39.7335	-109.6605	614783	4398828	12S	Recorded
65	Bangs Mountain	Ferry	35 N	37 E	6,7	48.5543	-118.2118	410572	5378637	11U	Recorded
66	Black Star	Ferry	36 N	35 E	22, 27	48.5950	-118.4018	396637	5383390	11U	Recorded
67	Bead Lake quarry	Pend Oreille	32 N	45 E	5 swse	48.2992	-117.1427	489415	5349569	11U	Recorded
68	Columbia Quartzite (Pit 1 and yard)	Ferry	36 N	37 E	11	48.6408	-118.1237	417218	5388132	11U	Recorded
69	Columbia Quartzite (Pit 2)	Ferry	36 N	37 E	11	48.6413	-118.1252	417114	5388201	11U	Recorded
70	Lloyd Logging rip rap	Okanogan	35 N	21 E	26 ne	48.5060	-120.1660	709314	5376428	10U	Recorded
71	Tollefson rip rap	Okanogan	32 N	25 E	3 nene	48.3058	-119.6705	301976	5353745	11U	Recorded
72	Cougar Mountain (sec. 8 unnamed)	Pend Oreille	32 N	45 E	8 sese	48.2844	-117.1383	489741	5347923	11U	Recorded
73	FS Rd 132-Flatrock	Pend Oreille	32 N	45 E	9 sesese	48.2829	-117.1324	490175	5347740	11U	Recorded
74	Unknown Sec. 9	Pend Oreille	32 N	45 E	9 nwsw	48.2849	-117.1321	490200	5347981	11U	Recorded
75	Bacon rock quarry	San Juan	38 S	24 E	30 nese	37.4547	-109.3162	648935	4146659	12S	Recorded
76	Boundary quarry community pit	Garfield	33 S	5 W	18 swsw	37.9413	-112.4645	371310	4200329	12S	Recorded
77	Bitter Seep quarry community pit	Mohave	39 N	3 W	6	36.8095	-112.6577	352135	4075776	12S	Recorded
78	Moenkopi Moca pit/plant	Kane	43 S	4 W	32 nwse	37.0267	-112.2547	388397	4098568	12S	Recorded
79	Shinarump quarry community pit	Kane	43 S	4 W	31 lot 4	37.0245	-112.2835	385836	4098364	12S	Recorded
80	Alton #1 aggregate pit	Kane	39 S	6 W	13 sesw	37.4209	-112.4759	369403	4142588	12S	Recorded
81	Sink Valley Community pit	Kane	39 S	5 W	31 s2nwse	37.3740	-112.4558	370951	4137095	12S	Recorded

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Color	Geology	Generalized_Rock_Unit
58	Reese Jenson-Fairbank-area 1	Light brown	Upper Green River Form.-Parachute Creek member	GreenRiver
59	Reese Jenson-Fairbank-area 2	Light brown	Upper Green River Form.-Parachute Creek member	GreenRiver
60	Rock-It Stone Works (Yard)	--	--	--
61	Seep Ridge common use	Light brown	Upper Green River Form.	GreenRiver
62	United Stone	Light brown	Upper Green River Form.	GreenRiver
63	United Stone (Abblecio Jiron #3)	Light brown	Upper Green River Form.	GreenRiver
64	Unknown	Light brown	Upper Green River Form.	GreenRiver
65	Bangs Mountain	Light greenish gray	Kettle Range gneiss dome	Orthogneiss
66	Black Star	Black	Kettle Range gneiss dome	Orthogneiss
67	Bead Lake quarry	Medium gray	Prichard Form. (Pre-Camb.)	Prichard
68	Columbia Quartzite (Pit 1 and yard)	Light brown	Kettle Range gneiss dome	Orthogneiss
69	Columbia Quartzite (Pit 2)	Light brown	Kettle Range gneiss dome	Orthogneiss
70	Lloyd Logging rip rap	Greenish gray	Buck Mtn. Formation	BuckMtnForm
71	Tollefson rip rap	Greenish gray	Okanogan gneiss dome	Orthogneiss
72	Cougar Mountain (sec. 8 unnamed)	Medium gray	Prichard Form. (Pre-Camb.)	Prichard
73	FS Rd 132-Flatrock	Medium gray	Prichard Form. (Pre-Camb.)	Prichard
74	Unknown Sec. 9	Medium gray	Prichard Form. (Pre-Camb.)	Prichard
75	Bacon rock quarry	Light brown	Dakota Sandstone	Dakota
76	Boundary quarry community pit	Medium green	Bear Valley Formation (Tertiary)	BearValleyForm
77	Bitter Seep quarry community pit	Reddish brown	Moenkopi Formation	Moenkopi
78	Moenkopi Moca pit/plant	Reddish brown	Moenkopi Formation	Moenkopi
79	Shinarump quarry community pit	Grayish pink	Shinarump Cgl. Member of Chinle Form.	ShinarumpMbr
80	Alton #1 aggregate pit	Orange brown	Clinker and burned shale from Alton coal beds (Dakota Ss)	Dakota
81	Sink Valley Community pit	Orange brown	Clinker and burned shale from Alton coal beds (Dakota Ss)	Dakota

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Lithologic_Description	Generalized_Lithology
58	Reese Jenson-Fairbank-area 1	Sandstone, buff colored	Sandstone
59	Reese Jenson-Fairbank-area 2	Sandstone, buff colored	Sandstone
60	Rock-It Stone Works (Yard)	--	--
61	Seep Ridge common use	Sandstone, buff colored	Sandstone
62	United Stone	Sandstone, buff, blocks 4 in x 4 in x 2 ft	Sandstone
63	United Stone (Abblecio Jiron #3)	Sandstone, buff colored	Sandstone
64	Unknown	Sandstone, flagstone, buff colored	Sandstone
65	Bangs Mountain	Quartzite, mylonitic	Quartzite
66	Black Star	Amphibolite, black color, some pieces layered	Amphibolite
67	Bead Lake quarry	Quartizte, gray argillitic, flagstone	Quartzite
68	Columbia Quartzite (Pit 1 and yard)	Quartzite, thick and thin bedded, with micaceous partings	Quartzite
69	Columbia Quartzite (Pit 2)	Quartzite, very thick bedded	Quartzite
70	Lloyd Logging rip rap	Greenstone (intrusive or metabasalt)	Granitic
71	Tollefson rip rap	Granodiorite mixed phase rock	Granitic
72	Cougar Mountain (sec. 8 unnamed)	Shale, medium gray, silty, slightly metamorphosed	Shale
73	FS Rd 132-Flatrock	Shale, medium gray, silty, slightly metamorphosed	Shale
74	Unknown Sec. 9	Shale, medium gray, silty, slightly metamorphosed	Shale
75	Bacon rock quarry	Sandstone, large blocks and flagstone of light brown	Sandstone
76	Boundary quarry community pit	Sandstone, green, friable, of fluvial origin	Sandstone
77	Bitter Seep quarry community pit	Sandstone, reddish brown flaggy	Sandstone
78	Moenkopi Moca pit/plant	Sandstone, reddish brown flaggy; and large blocks of massive sandstone; consistent unbroken massive granularity	Sandstone
79	Shinarump quarry community pit	Boulders, moss rock, for landscape	Boulders
80	Alton #1 aggregate pit	Clinker and burned shale	Clinker
81	Sink Valley Community pit	Clinker and burned shale	Clinker

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Other_characteristics	Extraction_Fractures_Cleavability	Product_Dimension_Fractures_Cleavability
58	Reese Jenson-Fairbank-area 1	--	Favorable with respect to extraction	Favorable with respect to product dimensions.
59	Reese Jenson-Fairbank-area 2	--	Favorable with respect to extraction	Favorable with respect to product dimensions.
60	Rock-It Stone Works (Yard)	--	--	--
61	Seep Ridge common use	There is general lack of material to collect	Favorable with respect to extraction	Favorable with respect to product dimensions.
62	United Stone	--	Favorable with respect to extraction	Favorable with respect to product dimensions.
63	United Stone (Abblecio Jiron #3)	--	--	--
64	Unknown	--	Favorable with respect to extraction	Favorable with respect to product dimensions.
65	Bangs Mountain	Breaks in large blocks	Unfavorable with respect to extraction	Unfavorable with respect to product dimensions
66	Black Star	Breaks in large blocks	Unfavorable with respect to extraction	Unfavorable with respect to product dimensions
67	Bead Lake quarry	Splits into thicknesses of 1 to 3 in; durable and hard	Favorable with respect to extraction	Favorable with respect to product dimensions.
68	Columbia Quartzite (Pit 1 and yard)	Forms thin, hard and durable sheets of quartzite	Favorable with respect to extraction	Favorable with respect to product dimensions.
69	Columbia Quartzite (Pit 2)	Breaks in large blocks with high strength	Favorable with respect to extraction	Favorable with respect to product dimensions.
70	Lloyd Logging rip rap	Random blocks	Not Applicable.	Not applicable
71	Tollefson rip rap	Random blocks	Not Applicable.	Not applicable
72	Cougar Mountain (sec. 8 unnamed)	Sheets of argilliate are moderately durable and hard	Favorable with respect to extraction	Favorable with respect to product dimensions.
73	FS Rd 132-Flatrock	Sheets of argilliate are moderately durable and hard	Favorable with respect to extraction	Favorable with respect to product dimensions.
74	Unknown Sec. 9	--	Favorable with respect to extraction	Favorable with respect to product dimensions.
75	Bacon rock quarry	readily splits into sheets	Unfavorable with respect to extraction	Unfavorable with respect to product dimensions
76	Boundary quarry community pit	Moderately durable	Favorable with respect to extraction	Favorable with respect to product dimensions.
77	Bitter Seep quarry community pit	Large massive blocks and flaggy sandstone with clayey partings	Favorable with respect to extraction	Favorable with respect to product dimensions.
78	Moenkopi Moca pit/plant	--	Favorable with respect to extraction	Favorable with respect to product dimensions.
79	Shinarump quarry community pit	--	Not Applicable.	Unfavorable with respect to product dimensions
80	Alton #1 aggregate pit	Exceptional jumble of different varitions of clinker, shale, burned shale		
81	Sink Valley Community pit	Wide variety of clinker, shale, burned shale is intermixed	Not Applicable.	Not applicable

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Influence_of_Texture	Uniform_Thickness	Lithology_Hardness_Durability	Rock_Quality_Suitability
58	Reese Jenson-Fairbank-area 1	No Influence	Yes	Advantageous	Good to excellent quality; hard, durable sandstone
59	Reese Jenson-Fairbank-area 2	No Influence	Yes	Advantageous	Good to excellent quality; hard, durable sandstone
60	Rock-It Stone Works (Yard)	--	--	--	--
61	Seep Ridge common use	No Influence	Yes	Disadvantageous	Good quality; hard, durable sandstone
62	United Stone	Likely influence	Yes	Advantageous	Good durability for landscape rock
63	United Stone (Abblecio Jiron #3)	--	--	--	Unknown
64	Unknown	No Influence	Yes	Advantageous	Good to excellent quality; hard, durable sandstone
65	Bangs Mountain	No Influence	Yes	Disadvantageous	Thinly fissile shale yields a poor quality of flagstone
66	Black Star	Likely influence	No	Disadvantageous	Mostly unsuitable except for use as blocks; black color is unusual and may be advantage
67	Bead Lake quarry	Likely influence	Yes	Advantageous	Huge reserve; manual labor to sort and split is only limiting factor
68	Columbia Quartzite (Pit 1 and yard)	Likely influence	Yes	Advantageous	Potential for large reserve of good quality flagstone
69	Columbia Quartzite (Pit 2)	Likely influence	Yes	Advantageous	Potential for large reserve of good quality fountain blocks
70	Lloyd Logging rip rap	No Influence	No	Moderately Advantageous	Good for rip rap or crushed product
71	Tollefson rip rap	No Influence	No	Moderately Advantageous	Good for rip rap or crushed product
72	Cougar Mountain (sec. 8 unnamed)	Likely influence	Yes	Advantageous	Potential for large reserve; vertical dip of beds simplifies mining
73	FS Rd 132-Flatrock	No Influence	Yes	Advantageous	Good quality flagstone; but pyrite content may limit usefulness
74	Unknown Sec. 9	No Influence	Yes	Advantageous	Good quality flagstone; but pyrite content may limit usefulness
75	Bacon rock quarry	No Influence	Yes	Advantageous	Good quality
76	Boundary quarry community pit	Likely influence	Yes	Advantageous	Sandstone is relatively soft. Exterior application is limited to dry climates. Surface uniformly rough & skid resistant.
77	Bitter Seep quarry community pit	Likely influence	Yes	Moderately Advantageous	Disposal of waste a limiting factor
78	Moenkopi Moca pit/plant	Likely influence	Yes	Advantageous	Moderately durable for flagstone and dimension stone
79	Shinarump quarry community pit	Likely influence	No	Moderately Advantageous	Primarily used as landscape rock
80	Alton #1 aggregate pit				Good
81	Sink Valley Community pit	No Influence	No	Disadvantageous	Clinker material is only suitable for aggregate purpose

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Size	Ease_of_Extraction	Extent_of_Deposit	Reserve_Limits_Overburden
58	Reese Jenson-Fairbank-area 1	Small	Very easy (no mechanized equipment required, although it might be used)	Extended	Reserve large, but unknown
59	Reese Jenson-Fairbank-area 2	Small	Very easy (no mechanized equipment required, although it might be used)	Extended	Reserve large, but unknown
60	Rock-It Stone Works (Yard)	Yard-wholesale	--	--	--
61	Seep Ridge common use	Small-Material site	Very easy (no mechanized equipment required, although it might be used)	Limited or Confined	Reserve small, but area large; stone is sparsely scattered; only surface removal is allowed
62	United Stone	Small	Very easy (no mechanized equipment required, although it might be used)	Surficial	Limited to thin seams
63	United Stone (Abblecio Jiron #3)	Medium	--	--	Unknown
64	Unknown	Small	Very easy (no mechanized equipment required, although it might be used)	Extended	Reserve large, but unknown
65	Bangs Mountain	Small-Material site	Moderately easy	Limited or Confined	Overburden hampers extraction beyond limit of current pit
66	Black Star	Small	Difficult (blasting required under confined or otherwise difficult conditions).	Limited or Confined	Unknown reserve
67	Bead Lake quarry	Large	Moderately easy	Extended	Extensive reserve; hundreds of thousands of tons
68	Columbia Quartzite (Pit 1 and yard)	Small	Moderately easy	Limited or Confined	Unknown reserve
69	Columbia Quartzite (Pit 2)	Small	Moderately easy	Extended	Large reserve; overburden of little consequence
70	Lloyd Logging rip rap	Small	Moderately difficult	Extended	Large reserve; overburden of little consequence
71	Tollefson rip rap	Small	Moderately difficult	Extended	Large reserve; overburden of little consequence
72	Cougar Mountain (sec. 8 unnamed)	Medium	Moderately easy	Extended	Large reserve; overburden of little consequence
73	FS Rd 132-Flatrock	Small	Very easy (no mechanized equipment required, although it might be used)	Limited or Confined	Unknown reserve; 2-4 ft overburden
74	Unknown Sec. 9	Small	Very easy (no mechanized equipment required, although it might be used)	Limited or Confined	Unknown reserve; 1-2 ft overburden
75	Bacon rock quarry	Large	Moderately difficult (blasting likely required, or extraction otherwise made difficult through extensive overburden, unfavorable structure, etc.)	Extended	Unknown reserve
76	Boundary quarry community pit	Small-Material site	Moderately easy	Extended	Pit area contains several hundred thousand tons of recoverable flagstone.
77	Bitter Seep quarry community pit	Small-Material site	Very easy (no mechanized equipment required, although it might be used)	Extended	Little overburden; unknown reserve
78	Moenkopi Moca pit/plant	Large	Moderately difficult	Extended	Extensive reserves > 10 years
79	Shinarump quarry community pit	Small-Material site	Moderately easy	Limited or Confined	Unknown reserve
80	Alton #1 aggregate pit	Large-Material site			Nearly depleted
81	Sink Valley Community pit	Large-Material site	Very easy (no mechanized equipment required, although it might be used)	Extended	Nearly depleted

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Number_Products	Known_Products	Acres	Mining_Method	Hand_Methods
58	Reese Jenson-Fairbank-area 1	Small (1 - 2 products)	Curbstone, boulders, random blocks	--	Hand only	Surface collection
59	Reese Jenson-Fairbank-area 2	Small (1 - 2 products)	Curbstone, boulders, random blocks	--	Hand only	Surface collection
60	Rock-It Stone Works (Yard)	--	--	--	--	--
61	Seep Ridge common use	Small (1 - 2 products)	Curbstone, flagstone, random blocks	--	Hand only	Surface collection
62	United Stone	Medium (3-5 products)	Landscape rock	--	Hand only	Surface collection
63	United Stone (Abblecio Jiron #3)	--	Sandy flagstone; curbstones	--	Hand only	Surface collection
64	Unknown	Small (1 - 2 products)	Curbstone, boulders, random blocks	--	Hand only	Surface collection
65	Bangs Mountain	Small (1 - 2 products)	Flaggy sandstone	--	Hand-mechanized combined	Hand split, sort
66	Black Star	Small (1 - 2 products)	Random blocks, some are flaggy	2	--	--
67	Bead Lake quarry	Small (1 - 2 products)	Gray argillite in sizes: 1" standup, 2" patio, 3" ledge (Dry stack)	30	Hand-mechanized combined	Hand split, sort
68	Columbia Quartzite (Pit 1 and yard)	Medium (3-5 products)	Flaggy quartzite	--	Hand-mechanized combined	Hand split, sort
69	Columbia Quartzite (Pit 2)	Small (1 - 2 products)	Quartzite boulders,	--	Mechanized	None
70	Lloyd Logging rip rap	Small (1 - 2 products)	Boulders for rip rap and crushed material or landscape	--	Mechanized	None
71	Tollefson rip rap	Small (1 - 2 products)	Granodiorite boulders	--	Mechanized	None
72	Cougar Mountain (sec. 8 unnamed)	Small (1 - 2 products)	Thick flaggy argillite	5+	Hand-mechanized combined	Hand split, sort
73	FS Rd 132-Flatrock	Small (1 - 2 products)	Flaggy argillite	0.5	Hand-mechanized combined	Hand split, sort
74	Unknown Sec. 9	Small (1 - 2 products)	Flaggy argillite	0.5	Hand-mechanized combined	Hand split, sort
75	Bacon rock quarry	Small (1 - 2 products)	Light brown sandstone; large blocks to 2 ft thick; flagstone, 1-2 inch	4	Hand-mechanized combined	Hand split, sort
76	Boundary quarry community pit	Small (1 - 2 products)	Flagstone	5	Hand-mechanized combined	Hand split, sort
77	Bitter Seep quarry community pit	Small (1 - 2 products)	Flagstone; large block for dimension sawing, fashioning	10	Hand-mechanized combined	Hand split, sort
78	Moenkopi Moca pit/plant	Medium (3-5 products)	Large blocks measure 4.5ft x 8 ft x 2 ft; flagstone	15	Mechanized	None
79	Shinarump quarry community pit	Small (1 - 2 products)	Boulders, blocks, some flagstone	--	Hand only	Surface collection
80	Alton #1 aggregate pit	--	Ground Cover Stone	--	Mechanized	None
81	Sink Valley Community pit	Small (1 - 2 products)	Crushed aggregate	25	Mechanized	None

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Mining_Description	Production_rate
58	Reese Jenson-Fairbank-area 1	Surface collection only	--
59	Reese Jenson-Fairbank-area 2	Surface collection only	--
60	Rock-It Stone Works (Yard)	--	--
61	Seep Ridge common use	--	--
62	United Stone	Surface collection only	Past production 44 tons
63	United Stone (Abblecio Jiron #3)	--	--
64	Unknown	Surface collection only of large blocks 2ftx6ftx4in and smaller blocks of 2inx2inx20in	--
65	Bangs Mountain	--	--
66	Black Star	--	Minimal
67	Bead Lake quarry	--	5760 tons/year
68	Columbia Quartzite (Pit 1 and yard)	--	--
69	Columbia Quartzite (Pit 2)	--	--
70	Lloyd Logging rip rap	--	120 tons in 2003
71	Tollefson rip rap	--	--
72	Cougar Mountain (sec. 8 unnamed)	Dig with track excavator, hand sort, palletize	500 tons per year
73	FS Rd 132-Flatrock	Dig with track excavator, hand sort, palletize	Unknown
74	Unknown Sec. 9	Dig with track excavator, hand sort, palletize	Unknown
75	Bacon rock quarry	quarry	2,700 to 3,200 tpy in years 2000-2003
76	Boundary quarry community pit	Dig with track excavator, hand sort, palletize	--
77	Bitter Seep quarry community pit	Dig with equipment of by hand methods	--
78	Moenkopi Moca pit/plant	Drill, blast along line of vertical drill holes in sandstone 10-12 in apart for 7-ft thick blocks use 25 g detonation cord; remove with forklift and truck to plant for sawing and additional fashioning	2300 t large blocks; 1100 t dimension stone
79	Shinarump quarry community pit	Surface collection only	--
80	Alton #1 aggregate pit	Quarry	--
81	Sink Valley Community pit	Quarry	--

IDNo	Name	Processing_onsite	Work_schedule	Personnel	Buildings
58	Reese Jenson-Fairbank-area 1	--	--	2 laborers	--
59	Reese Jenson-Fairbank-area 2	--	--	2 laborers	--
60	Rock-It Stone Works (Yard)	--	--	--	--
61	Seep Ridge common use	--	--	--	--
62	United Stone	--	--	2 laborers	--
63	United Stone (Abblecio Jiron #3)	--	--	--	--
64	Unknown	--	--	--	--
65	Bangs Mountain	--	--	--	--
66	Black Star	--	--	--	--
67	Bead Lake quarry	drill, blast, dig with excavator, haul by truck to yard 1/4 mi, laborers split and palletize	--	16 laborers, 4 operators, 2 pit supervisors	--
68	Columbia Quartzite (Pit 1 and yard)	--	--	--	--
69	Columbia Quartzite (Pit 2)	--	--	--	--
70	Lloyd Logging rip rap	Drill, blast ($1/ton), load with wheel loader	--	--	--
71	Tollefson rip rap	--	--	--	--
72	Cougar Mountain (sec. 8 unnamed)	No others	5 d/week, 6-8 hr/day	1 operator (owner), 2 splitters (labor)	None
73	FS Rd 132-Flatrock	Unknown	--	--	--
74	Unknown Sec. 9	Unknown	--	--	--
75	Bacon rock quarry	Split, cris-cutter to size, palletize	--	10 full time, $8-12/hr 8 hr/d 5d/wk year-round; 4-12 seasonal laborers $8-12/hr 8hr/d, 5d/wk, 20 weeks	None
76	Boundary quarry community pit	--	--	2-3 laborers, 1 owner	--
77	Bitter Seep quarry community pit	--	--	--	--
78	Moenkopi Moca pit/plant		8 hr/d; 255 d/yr	3 laborers, $12/hr; 1 owner $20/hr	Maint. shop/saw plant
79	Shinarump quarry community pit	--	--	2 laborers, 1 owner	--
80	Alton #1 aggregate pit	--	--	--	--
81	Sink Valley Community pit	Crush, screen, and load on trucks	--	--	--

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Equipment	Product_inventory
58	Reese Jenson-Fairbank-area 1	1 forklift; 1 Ford f250 w/trailer	--
59	Reese Jenson-Fairbank-area 2	1 forklift; 1 Ford f250 w/trailer	--
60	Rock-It Stone Works (Yard)	--	--
61	Seep Ridge common use	--	--
62	United Stone	1 forklift; 1 Ford PU with 4-wheel trailer	--
63	United Stone (Abblecio Jiron #3)	--	--
64	Unknown	1 Ford F350 HD PU with extended flatbed trailer; 1975 Ford crane truck	--
65	Bangs Mountain	--	--
66	Black Star	--	--
67	Bead Lake quarry	2 CAT track excavators, 1 CAT wheel loader, 1 CAT forklift, 1 dump truck, 12-ton	600 pallets includes: 480 pallets of 2-4" flagstone, 180 pallets of 1" standup flagstone
68	Columbia Quartzite (Pit 1 and yard)	--	8 tons patio slabs on pallets; many large boulders
69	Columbia Quartzite (Pit 2)	--	--
70	Lloyd Logging rip rap	--	--
71	Tollefson rip rap	--	--
72	Cougar Mountain (sec. 8 unnamed)	1 track excavator, 1 Cat 210 forklift	48 pallets of 3-4 inch flagstone, 4 pallets 1 inch standup flagstone
73	FS Rd 132-Flatrock	--	--
74	Unknown Sec. 9	--	--
75	Bacon rock quarry	1 Daewoo DH280 track excavator, 2 criss-cutters, 1 band saw (4ft), 1 wheel loader, CAT 988 w forks, 1 grader, CAT 12, 1 seimw/flatbed	none; out of business
76	Boundary quarry community pit	--	5 pallets; flagstone 1-3 in; large blocks to several tons
77	Bitter Seep quarry community pit	--	--
78	Moenkopi Moca pit/plant	1 Clark artic. wheel loader, 1 D-8 dozer, 1 track excavator, compressor and track drill; radial saw (30-in), band saw (4-ft x 12-ft)	Lots; didn't count
79	Shinarump quarry community pit	--	--
80	Alton #1 aggregate pit	--	--
81	Sink Valley Community pit	--	--

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Sales_price	Market_description	Destination
58	Reese Jenson-Fairbank-area 1	$12/t royalty for <150 tons	--	--
59	Reese Jenson-Fairbank-area 2	$12/t royalty for <150 tons	--	--
60	Rock-It Stone Works (Yard)	--	--	--
61	Seep Ridge common use	--	--	--
62	United Stone	--	--	--
63	United Stone (Abblecio Jiron #3)	--	--	--
64	Unknown	Offer terms: 400 tons at $20.5/t royalty; expires 2009	--	--
65	Bangs Mountain	--	--	--
66	Black Star	--	--	--
67	Bead Lake quarry	--	--	Haul to Polson, MT to company's yard
68	Columbia Quartzite (Pit 1 and yard)	--	--	--
69	Columbia Quartzite (Pit 2)	--	--	--
70	Lloyd Logging rip rap	$17/cu yd	--	--
71	Tollefson rip rap	--	--	--
72	Cougar Mountain (sec. 8 unnamed)	$125/ton for 3-4 in flagstone, $225 for 1 inch flagstone	Costco will buy if can produce; unable to produce sufficient quantity	Unknown
73	FS Rd 132-Flatrock	--	--	--
74	Unknown Sec. 9	--	--	--
75	Bacon rock quarry	$127/ton average	--	Denver, CO, Durango, CO, Ketchum, ID, Arches NM, UT
76	Boundary quarry community pit	--	--	--
77	Bitter Seep quarry community pit	--	--	--
78	Moenkopi Moca pit/plant	large block: $120-14/t; flagstone: 230-240/t	--	Large blocks shipped to east coast; flagstone marketed in St George; others N.Mexico, Utah, Colorado
79	Shinarump quarry community pit	--	--	--
80	Alton #1 aggregate pit	--	--	--
81	Sink Valley Community pit	--	--	--

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Prod_1995	Prod_1996	Prod_1997	Prod_1998	Prod_1999	Prod_2000	Prod_2001	Prod_2002	Prod_2003	Prod_2004	Max_prod
58	Reese Jenson-Fairbank-area 1							NR	6	82	NR	82
59	Reese Jenson-Fairbank-area 2								NR	NR		
60	Rock-It Stone Works (Yard)											
61	Seep Ridge common use											
62	United Stone							0	NR	NR	NR	
63	United Stone (Abblecio Jiron #3)				87	1627	344	803	NR	Confid.	Confid.	1627
64	Unknown										92	92
65	Bangs Mountain											
66	Black Star											
67	Bead Lake quarry										5760	5760
68	Columbia Quartzite (Pit 1 and yard)										100	100
69	Columbia Quartzite (Pit 2)											
70	Lloyd Logging rip rap									120		120
71	Tollefson rip rap											
72	Cougar Mountain (sec. 8 unnamed)										500	500
73	FS Rd 132-Flatrock											
74	Unknown Sec. 9											
75	Bacon rock quarry			1800	3700	NR	3200	2700	900	0	NR	3700
76	Boundary quarry community pit											
77	Bitter Seep quarry community pit											
78	Moenkopi Moca pit/plant	NR	NR	Confid.	609	515	437	719	2926	2980	3400	3400
79	Shinarump quarry community pit											
80	Alton #1 aggregate pit											
81	Sink Valley Community pit											

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IDNo	Name	Comments
58	Reese Jenson-Fairbank-area 1	Cancelllation pending; areas 1 and 2 are within one BLM case file
59	Reese Jenson-Fairbank-area 2	Cancelllation pending; areas 1 and 2 are within one BLM case file
60	Rock-It Stone Works (Yard)	No stone gathering areas used at this time
61	Seep Ridge common use	--
62	United Stone	NR=Not reported
63	United Stone (Abblecio Jiron #3)	SITLA leased to Western States Stone Supply SITLA production data here is CONFIDENTIAL; DOGM 3 permitted operations combined
64	Unknown	--
65	Bangs Mountain	--
66	Black Star	--
67	Bead Lake quarry	Production data from USFS personnel; company person says ship 2 flatbed trucks/d on Mon-Wed and 3 flatbeds/d on Thu-Fri.
68	Columbia Quartzite (Pit 1 and yard)	--
69	Columbia Quartzite (Pit 2)	--
70	Lloyd Logging rip rap	--
71	Tollefson rip rap	--
72	Cougar Mountain (sec. 8 unnamed)	--
73	FS Rd 132-Flatrock	--
74	Unknown Sec. 9	--
75	Bacon rock quarry	--
76	Boundary quarry community pit	--
77	Bitter Seep quarry community pit	--
78	Moenkopi Moca pit/plant	3400 tons (Hansen, written commun. 2004) SITLA production data here is CONFIDENTIAL
79	Shinarump quarry community pit	--
80	Alton #1 aggregate pit	No data
81	Sink Valley Community pit	--

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Alt_Name	Location_State	Surface_Mgmt	Case_Type	Visited	Photos	Sampled	Date_Visit	Status
82	Red Canyon basalt Community pit	--	UT	Kanab FO	Material site	Yes	Yes	Yes	Oct 18 2004	Active
83	Silver Arrow Stone Co. (retail)	--	AZ	Private	Private	Yes	Yes	No	Oct 19 2004	Active
84	Brown's Canyon #1	--	UT	Private	Private	No	No	No	Aug 26 2004	Active
85	Rosebud #1-2/Sage Green	--	UT	Salt Lake FO	Claims	Yes	Yes	Yes	June 30 2004	Active
86	Goose Creek talus #2	--	UT	Salt Lake FO/Private	Private	Yes	Yes	Yes	Aug 3 2004	Active
87	Dove Creek Pass outcrop	--	UT	Salt Lake FO	Unknown	Yes	Yes	Yes	Aug 3 2004	Raw
88	Goose Creek unnamed talus and pit	--	UT	Unknown	Unknown	Yes	Yes	Yes	Aug 3 2004	Inactive
89	Granite - 14N-17W-17	--	UT	Salt Lake FO/Private	Claims	Yes	Yes	Yes	June 29 2004	Inactive
90	Buckskin	--	UT	Salt Lake FO/Private	Claims	Yes	Yes	Yes	June 29 2004	Active
91	Cotton Thomas outcrop	--	UT	Salt Lake FO	Unknown	Yes	Yes	Yes	July 23 2004	Raw
92	Unnamed Gold Star	--	UT	Salt Lake FO/Private	Private	Yes	Yes	Yes	July 1 2004	Active
93	Sawtooth (unnamed) main quarry	--	UT	Salt Lake FO	Private	Yes	Yes	Yes	July 1 2004	Active
94	Lone Pine (old pit)	--	UT	Salt Lake FO/Private	Private	Yes	Yes	Yes	July 1 2004	Inactive
95	Lone Pine (new pit)	--	UT	Private	Private	Yes	Yes	Yes	July 1 2004	Active
96	Autumn Gold	--	UT	Salt Lake FO/Private	Claims	Yes	Yes	Yes	June 29 2004	Active
97	Aspen (DOGM's Cotton Thomas)	Cotton Thomas	UT	Salt Lake FO/Private	Claims	Yes	Yes	Yes	June 29 2004	Active
98	Gneiss-ridge line (reclaimed)	--	UT	Salt Lake FO	Claims	Yes	Yes	Yes	June 29 2004	Past producer
99	Lynn Pass quarry	--	UT	Salt Lake FO/Private	Claims	Yes	Yes	Yes	June 29 2004	Active
100	Lynn Spring quarry	--	UT	Salt Lake FO	Claims	Yes	Yes	Yes	Aug 2 2004	Active
101	Glacial Green #1	--	UT	Salt Lake FO	Claims	Yes	Yes	Yes	Aug 2 2004	Active

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IDNo	Name	Map_Name	Type_Site	Claim_Name	BLM_Case	SubTerra_Number	UT_DOGM_ID
82	Red Canyon basalt Community pit	Panguitch 100k	Quarry	--	UTU 067820	UTU 067820	--
83	Silver Arrow Stone Co. (retail)	Fredonia 100k	Yard, retail	--	--	--	--
84	Brown's Canyon #1	Park City East 7.5-min	Quarry	--	--	--	m430019
85	Rosebud #1-2/Sage Green	Grouse Creek 100k	Quarry	Rosebud #1-#2	UTU 077761	m030026	m030026
86	Goose Creek talus #2	Cotton Thomas 7.5 min	Quarry	--	--	--	--
87	Dove Creek Pass outcrop	Lynn Reservoir 7.5	Proposed site, Outcrop	--	--	--	--
88	Goose Creek unnamed talus and pit	Cotton Thomas 7.5 min	Surface collection only from large area of talus	--	--	--	--
89	Granite - 14N-17W-17	Cotton Thomas 7.5 min	Quarry	--	--	--	--
90	Buckskin	Cotton Thomas 7.5 min	Quarry	Placer	--	m030024	--
91	Cotton Thomas outcrop	Kimbell Cr 7.5 minm	Proposed site, Outcrop	--	--	--	--
92	Unnamed Gold Star	Cotton Thomas 7.5 min	Quarry	--	--	--	--
93	Sawtooth (unnamed) main quarry	Cotton Thomas 7.5 min	Quarry	--	--	--	s030068 (#1), m030067 (#2)
94	Lone Pine (old pit)	Cotton Thomas 7.5 min	Quarry	--	UTU 077019	m030050	--
95	Lone Pine (new pit)	Cotton Thomas 7.5 min	Quarry	--	UTU 077019	m030050	m030050
96	Autumn Gold	Cotton Thomas 7.5 min	Quarry	Placer	--		--
97	Aspen (DOGM's Cotton Thomas)	Cotton Thomas 7.5 min	Quarry	Placer	--	m030024	m030024
98	Gneiss-ridge line (reclaimed)	Cotton Thomas 7.5 min	Quarry, reclaimed	Trespass	--	--	--
99	Lynn Pass quarry	Kimbell Cr 7.5 minm	Quarry	Placer	--	--	--
100	Lynn Spring quarry	Lynn Reservoir 7.5	Quarry	Placer	UTU 077028	m030025	m030025
101	Glacial Green #1	Grouse Creek 100k	Quarry	Placer	UTU 075737	s030044	s030044

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	UT_SITLA_ID	Data_Source	Operator_Name
82	Red Canyon basalt Community pit	--	Alan Feller, St George, UT, Brett George Panguitch, UT; SubTerra (2004)	Bureau of Land Management
83	Silver Arrow Stone Co. (retail)	--	Lawrence Casebolt	Silver Arrow Stone Co. HC 64 Box 1532 Fredonia, AZ 86022
84	Brown's Canyon #1	--	UT DOGM files	Mountain Valley Stone, Robert Hicken
85	Rosebud #1-2/Sage Green	--	Mike Ford, SLFO; SubTerra (2004); UT DOGM	Star Stone quarries, Lon Thomas
86	Goose Creek talus #2	--	--	Unknown
87	Dove Creek Pass outcrop	--	--	
88	Goose Creek unnamed talus and pit	--	--	Unknown
89	Granite - 14N-17W-17	--	Mike Ford, SLFO	American Stone, Lon Thomas
90	Buckskin	--	Mike Ford, SLFO; SubTerra (2004)	American Stone, Lon Thomas
91	Cotton Thomas outcrop	--	--	
92	Unnamed Gold Star	--	--	Unknown
93	Sawtooth (unnamed) main quarry	--	Bruce Mitchell	Sawtooth Stone 2104 South 100 East Oakley, ID 83346
94	Lone Pine (old pit)	--	Barry Peterson; SubTerra (2004)	Gold Star Stone, Barry Peterson, owner
95	Lone Pine (new pit)	--	Barry Peterson; SubTerra (2004)	Gold Star Stone, Barry Peterson, owner
96	Autumn Gold	--	Lon Thomas	American Stone, Lon Thomas
97	Aspen (DOGM's Cotton Thomas)	--	Lon Thomas; UT DOGM	American Stone, Lon Thomas
98	Gneiss-ridge line (reclaimed)	--	Mike Ford, SLFO	American Stone, Lon Thomas
99	Lynn Pass quarry	--	Tom Roper, owner	Dove Creek Rock Co.
100	Lynn Spring quarry	--	Bill Bown; SubTerra (2004); UT DOGM	Bonneville quarries, Bill Bown owner
101	Glacial Green #1	--	Russ Feller; SubTerra (2004); UT DOMG	A & R Leasing

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IDNo	Name	Operator_Address	Operator_State	Operator_Tele	Location_Descr
82	Red Canyon basalt Community pit		UT	--	8 mi S. of Panguitch (Hwy 89) and 2 mil E. of intersection (Hwy 12), then 1.2 mi N of Hwy 12
83	Silver Arrow Stone Co. (retail)	Fredonia AZ	AZ	928-643-7321	Fredonia
84	Brown's Canyon #1	2276 S. Daniels Rd, Heber, UT 84032	UT	435-654-0120	10 mi E of Park City UT
85	Rosebud #1-2/Sage Green	4040 W 300 W Salt Lake City UT 84107	UT	801-262 4300	--
86	Goose Creek talus #2	--		--	SE side of Goose Cr Mtns. Along Tom Sherry Cr Rd
87	Dove Creek Pass outcrop	--	UT	--	.2 mi N. of Dove Creek Pass
88	Goose Creek unnamed talus and pit	--	UT	--	E. side of Goose Cr Mtns. Along Tom Sherry Cr. Rd.
89	Granite - 14N-17W-17	Salt Lake City UT	UT	801-262-4300 Roger	Top of ridge, Goose Creek Mtns.
90	Buckskin	Salt Lake City UT	UT	801-262-4300 Roger	Top of ridge, Goose Creek Mtns.
91	Cotton Thomas outcrop	--	UT	--	Along Cotton Thomas Cr. Rd.
92	Unnamed Gold Star	--	UT	--	Top of ridge, Goose Creek Mtns.
93	Sawtooth (unnamed) main quarry	Oakley, ID	ID	208-862-3864	Top of ridge, Goose Creek Mtns.
94	Lone Pine (old pit)	--	UT	--	Top of ridge, Goose Creek Mtns.
95	Lone Pine (new pit)	--	UT	--	Top of ridge, Goose Creek Mtns.
96	Autumn Gold	Salt Lake City UT	UT	801-262-4300 Roger	South end of ridge, Goose Creek Mtns.
97	Aspen (DOGM's Cotton Thomas)	Salt Lake City UT	UT	801-262-4300 Roger	Top of ridge, Goose Creek Mtns.
98	Gneiss-ridge line (reclaimed)	Salt Lake City UT	UT	801-262-4300 Roger	Top of ridge, Goose Creek Mtns.
99	Lynn Pass quarry	173 E 550 S Farmington, UT 84025	UT	801-451-8567	From Lynn Pass NW through gate and 1/4-mi to top of hill
100	Lynn Spring quarry	842 W 400 N W. Bountiful, UT 84087	UT	801-295-0601	1 mi. S. of Raft River narrows
101	Glacial Green #1	688 E. Chad Ranch Rd. Veyo, UT 84782	UT	435-574-9300	Fisher Cr Canyon, S side of Raft River Range

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Location_County	Tp	Rg	Sec&Sub	Lat_dd	Long_dd	UTM_E	UTM_N	UTM_Zone	Coll_Method
82	Red Canyon basalt Community pit	Garfield	35 S	4.5 W	21 s2nwne	37.7558	-112.3388	382060	4179560	12S	Recorded
83	Silver Arrow Stone Co. (retail)	Mohave	41 N	2 W	5	36.9888	-112.5305	363979	4094732	12S	Calculated from trs
84	Brown's Canyon #1	Summit	1 S	5 E	20 csw	40.7157	-111.4091	465446	4507280	12T	Read from ArcMap
85	Rosebud #1-2/Sage Green	Box Elder	10 N	16 W	14 seswnw, swsesw	41.5843	-113.6478	279275	4606805	12T	Recorded
86	Goose Creek talus #2	Box Elder	14 N	17 W	21 n2swsw	41.9169	-113.8145	266596	4644375	12T	Recorded
87	Dove Creek Pass outcrop	Box Elder	13 N	16 W	22 sesw	41.8306	-113.6705	278242	4634415	12T	Recorded
88	Goose Creek unnamed talus and pit	Box Elder	14 N	17 W	29 nene	41.9220	-113.8163	266461	4644958	12T	Recorded
89	Granite - 14N-17W-17	Box Elder	14 N	17 W	17	41.9442	-113.8194	266276	4647213	12T	Recorded
90	Buckskin	Box Elder	14 N	17 W	20 nene, 21 nwnw	41.9280	-113.8153	266622	4645766	12T	Recorded
91	Cotton Thomas outcrop	Box Elder	13 N	17 W	10 nwnw	41.8693	-113.7933	268164	4638849	12T	Recorded
92	Unnamed Gold Star	Box Elder	14 N	17 W	34 sesenw	41.8938	-113.7860	268879	4641739	12T	Recorded
93	Sawtooth (unnamed) main quarry	Box Elder	14 N	17 W	28 sese	41.9022	-113.7980	267900	4642490	12T	Recorded
94	Lone Pine (old pit)	Box Elder	14 N	17 W	34 swswne	41.8925	-113.7815	269237	4641370	12T	Recorded
95	Lone Pine (new pit)	Box Elder	14 N	17 W	34 cse	41.8897	-113.7818	269196	4641064	12T	Recorded
96	Autumn Gold	Box Elder	14 N	17 W	21s2se, 28 n2ne	41.9164	-113.8045	267424	4644298	12T	Recorded
97	Aspen (DOGM's Cotton Thomas)	Box Elder	14 N	17 W	28 nwnwne, nene	41.9142	-113.8011	267698	4644044	12T	Recorded
98	Gneiss-ridge line (reclaimed)	Box Elder	14 N	17 W	21	41.9296	-113.8084	267148	4645774	12T	Recorded
99	Lynn Pass quarry	Box Elder	13 N	17 W	10 nwne	41.8700	-113.7820	269120	4638876	12T	Recorded
100	Lynn Spring quarry	Box Elder	14 N	16 W	20	41.9137	-113.7058	275598	4643744	12T	Recorded
101	Glacial Green #1	Box Elder	13 N	13 W	8 nwse	41.8658	-113.3573	304347	4637562	12T	Recorded

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Color	Geology	Generalized_Rock_Unit
82	Red Canyon basalt Community pit	Black	Basaltic andesite (Recent flow)	Basalt
83	Silver Arrow Stone Co. (retail)	--	--	--
84	Brown's Canyon #1	--	Nugget Sandstone	Nugget
85	Rosebud #1-2/Sage Green	Light green	Quartzite of Clarks Basin (Cambrian)	Qtzte_ClarksBasin
86	Goose Creek talus #2	Light gray	Quartzite of Clarks Basin (Cambrian)	Qtzte_ClarksBasin
87	Dove Creek Pass outcrop	--	Quartzite of Clarks Basin (Cambrian)	Qtzte_ClarksBasin
88	Goose Creek unnamed talus and pit	Light gray	Quartzite of Clarks Basin (Cambrian)	Qtzte_ClarksBasin
89	Granite - 14N-17W-17	Medium gray	Adamellite gneiss (Prec-Cambrian)	AdamelliteGneiss
90	Buckskin	Light gray	Quartzite of Clarks Basin (Cambrian)	Qtzte_ClarksBasin
91	Cotton Thomas outcrop	--	Quartzite of Clarks Basin (Cambrian)	Qtzte_ClarksBasin
92	Unnamed Gold Star	White	Quartzite of Clarks Basin (Cambrian)	Qtzte_ClarksBasin
93	Sawtooth (unnamed) main quarry	White	Quartzite of Clarks Basin (Cambrian)	Qtzte_ClarksBasin
94	Lone Pine (old pit)	Light gray	Quartzite of Clarks Basin (Cambrian)	Qtzte_ClarksBasin
95	Lone Pine (new pit)	Light gray	Quartzite of Clarks Basin (Cambrian)	Qtzte_ClarksBasin
96	Autumn Gold	Light gray	Quartzite of Clarks Basin (Cambrian)	Qtzte_ClarksBasin
97	Aspen (DOGM's Cotton Thomas)	Reddish brown	Quartzite of Clarks Basin (Cambrian)	Qtzte_ClarksBasin
98	Gneiss-ridge line (reclaimed)	Light gray	Adamellite gneiss (Prec-Cambrian)	AdamelliteGneiss
99	Lynn Pass quarry	Light gray	Quartzite of Clarks Basin (Cambrian)	Qtzte_ClarksBasin
100	Lynn Spring quarry	White	Quartzite of Clarks Basin (Cambrian)	Qtzte_ClarksBasin
101	Glacial Green #1	Turquoise green	Elba Quartzite (pC)	ElbaQtz_pC

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IDNo	Name	Lithologic_Description	Generalized_Lithology
82	Red Canyon basalt Community pit	Boulders or crushed rock	Boulders
83	Silver Arrow Stone Co. (retail)	--	--
84	Brown's Canyon #1	--	Sandstone
85	Rosebud #1-2/Sage Green	Quartzite, very light green	Quartzite
86	Goose Creek talus #2	Quartzite, talus, FeOx stained w/some white quartizte; minor muscovite along partings	Quartzite
87	Dove Creek Pass outcrop	Quartzite, very white, parts into thin slabs (no mining at this location)	Quartzite
88	Goose Creek unnamed talus and pit	Quartzite, iron oxide stained, on talus slope	Quartzite
89	Granite - 14N-17W-17	Granite to granite gneiss, gritty, fractured horizontally in upper 10 ft (sampled), overlain by white quartizite flagstone not sampled	Orthogneiss
90	Buckskin	Quartzite, flagstone, slaty, white, parts in .5-1 in slabs along micaceous planes	Quartzite
91	Cotton Thomas outcrop	Quartzite, light brown outcropping	Quartzite
92	Unnamed Gold Star	Quartzite, white, with planes of schistosity	Quartzite
93	Sawtooth (unnamed) main quarry	Quartzite, white, hard, splits along micaceous planes	Quartzite
94	Lone Pine (old pit)	Quartzite flagstone; Breaks into thin sheets (3/4-1.5") due to layers of mica; silvery and vitreous lustre due to high quartz and mica content between quartzite layers	Quartzite
95	Lone Pine (new pit)	Quartzite flagstone; Breaks into thin sheets (3/4-1.5") due to layers of mica; silvery and vitreous lustre due to high quartz and mica content between quartzite layers	Quartzite
96	Autumn Gold	Quartzite flagstone, breaks readily into 1/2-3" sheets along mica planes.	Quartzite
97	Aspen (DOGM's Cotton Thomas)	Quartzite flagstone, breaks readily into 1/2-3" sheets along mica planes.	Quartzite
98	Gneiss-ridge line (reclaimed)	Gneiss and granite slabs, due to weathering near surface	Orthogneiss
99	Lynn Pass quarry	Quartzite flagstone, white, 3/4"-2", mica layers on cleavage planes promotes splitting and gives pearly lustre	Quartzite
100	Lynn Spring quarry	Quartzite flagstone, 1/2" - 2" thick, micas give pearly lustre and promote splitting into thin sheets	Quartzite
101	Glacial Green #1	Quartzite, flaggy to massive, light green (coloration probably due to Cr-mica)	Quartzite

IDNo	Name	Other_characteristics	Extraction_Fractures_Cleavability	Product_Dimension_Fractures_Cleavability
82	Red Canyon basalt Community pit	Hardness	Not Applicable.	Not applicable
83	Silver Arrow Stone Co. (retail)	--	--	--
84	Brown's Canyon #1	--	--	--
85	Rosebud #1-2/Sage Green	--	Favorable with respect to extraction	Favorable with respect to product dimensions.
86	Goose Creek talus #2	--	Favorable with respect to extraction	Favorable with respect to product dimensions.
87	Dove Creek Pass outcrop	Color; hardness; splits along micaceous partings	--	--
88	Goose Creek unnamed talus and pit	Hardness, splits along mica partings	Favorable with respect to extraction	Favorable with respect to product dimensions.
89	Granite - 14N-17W-17	--	Unfavorable with respect to extraction	Favorable with respect to product dimensions.
90	Buckskin	Quartzite is hard and durable even when broken in thin sheets	Favorable with respect to extraction	Favorable with respect to product dimensions.
91	Cotton Thomas outcrop	Color; hardness and durability; splits along partings of 1-2 in thickness; dips down slope	--	--
92	Unnamed Gold Star	--	Favorable with respect to extraction	Favorable with respect to product dimensions.
93	Sawtooth (unnamed) main quarry	Hardness, splits along mica partings	Favorable with respect to extraction	Favorable with respect to product dimensions.
94	Lone Pine (old pit)	Hard durable quartzite flagstone slabs; must be extracted with hydraulic excavator	Favorable with respect to extraction	Unfavorable with respect to product dimensions
95	Lone Pine (new pit)	Thick soil overburden of 10-15 ft was being removed with excavator, and iron oxide oxidation in upper part of pit; unstable highwall during 2004	Favorable with respect to extraction	Favorable with respect to product dimensions.
96	Autumn Gold	--	Favorable with respect to extraction	Favorable with respect to product dimensions.
97	Aspen (DOGM's Cotton Thomas)	Quartzite is hard and durable even when broken in thin sheets.	Favorable with respect to extraction	Favorable with respect to product dimensions.
98	Gneiss-ridge line (reclaimed)	Slabs are highly irregular and do not form flagstone	Favorable with respect to extraction	Unfavorable with respect to product dimensions
99	Lynn Pass quarry	Mica gives pearly lustre; hardness, white color	Favorable with respect to extraction	Favorable with respect to product dimensions.
100	Lynn Spring quarry	Mica gives pearly lustre; hardness, white color; splits to very thin qtzte sheets; mica layers allow to split; white to silvery lustre due to mica flakes; splits into 1", 1/2", 3/4", and 1-1/2" thick plates	Favorable with respect to extraction	Favorable with respect to product dimensions.
101	Glacial Green #1	Brilliant, near irridescent green color is prominent through strata in part of mine	Favorable with respect to extraction	Unfavorable with respect to product dimensions

IDNo	Name	Influence_of_Texture	Uniform_Thickness	Lithology_Hardness_Durability	Rock_Quality_Suitability
82	Red Canyon basalt Community pit	No Influence	No	Advantageous	Hardness is an important factor for this rock
83	Silver Arrow Stone Co. (retail)	--	--	--	--
84	Brown's Canyon #1	No Influence	Yes	Advantageous	Moderate to low durability rock
85	Rosebud #1-2/Sage Green	Likely influence	Yes	Advantageous	Good quality
86	Goose Creek talus #2	Likely influence	Yes	Advantageous	Excellent
87	Dove Creek Pass outcrop	--	--	--	--
88	Goose Creek unnamed talus and pit	Likely influence	Yes	Advantageous	Good to excellent
89	Granite - 14N-17W-17	Likely influence	No	Advantageous	Moderate to poor quality
90	Buckskin	Likely influence	Yes	Advantageous	Excellent
91	Cotton Thomas outcrop	--	--	--	--
92	Unnamed Gold Star	Likely influence	No	Advantageous	Good to excellent
93	Sawtooth (unnamed) main quarry	Likely influence	Yes	Advantageous	Excellent
94	Lone Pine (old pit)	Likely influence	Yes	Advantageous	Proximity to fault seems to result in many small and broken slabs and blocks
95	Lone Pine (new pit)	No Influence	Yes	Advantageous	Fissile readily splits into flagstone
96	Autumn Gold	Likely influence	Yes	Advantageous	Excellent
97	Aspen (DOGM's Cotton Thomas)	No Influence	Yes	Advantageous	Good to excellent
98	Gneiss-ridge line (reclaimed)	No Influence	No	Moderately Advantageous	Limited amount of flagstone material is available
99	Lynn Pass quarry	No Influence	Yes	Advantageous	Good quality flagstone with limited supply
100	Lynn Spring quarry	No Influence	Yes	Advantageous	Excellent quality and attractive
101	Glacial Green #1	No Influence	No	Moderately Advantageous	Color is unusual; random sizes limit usefulness

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Size	Ease_of_Extraction	Extent_of_Deposit	Reserve_Limits_Overburden
82	Red Canyon basalt Community pit	Large-Material site	Difficult (blasting required under confined or otherwise difficult conditions).	Extended	Several thousand tons in mine area, large adjacent undeveloped reserves.
83	Silver Arrow Stone Co. (retail)	Yard-retail	--	--	--
84	Brown's Canyon #1	Large	--	Extended	Extensive > 10 year reserve
85	Rosebud #1-2/Sage Green	Medium	Moderately easy (extraction by ripping)	Extended	Extensive > 10 year reserve; 1-3 ft overburden
86	Goose Creek talus #2	Small	Very easy (no mechanized equipment required, although it might be used)	Extended	Little overburden; extensive reserve
87	Dove Creek Pass outcrop	Outcrop	--	--	--
88	Goose Creek unnamed talus and pit	Small	Very easy (no mechanized equipment required, although it might be used)	Extended	Unknown reserve
89	Granite - 14N-17W-17	Small	Moderately easy	Limited or Confined	No overburden
90	Buckskin	Medium	Moderately easy	Extended	Little overburden; near unlimited reserve
91	Cotton Thomas outcrop	Outcrop	--	--	--
92	Unnamed Gold Star	Medium	Very easy (no mechanized equipment required, although it might be used)	Limited or Confined	Limited overburden
93	Sawtooth (unnamed) main quarry	Large	Moderately easy	Extended	10 or more ft of overburden; near unlimited reserve
94	Lone Pine (old pit)	Small	Very easy (no mechanized equipment required, although it might be used)	Extended	Unknown reserve
95	Lone Pine (new pit)	Large	Moderately easy (extraction by ripping)	Extended	Extensive reserves > 10 years
96	Autumn Gold	Medium	Moderately easy	Extended	Little overburden; near unlimited reserve
97	Aspen (DOGM's Cotton Thomas)	Large	Moderately easy (extraction by ripping)	Extended	Large reserve > 10 year, limited overburden
98	Gneiss-ridge line (reclaimed)	Small	Moderately easy	Limited or Confined	Limited reserve
99	Lynn Pass quarry	Small	Very easy (no mechanized equipment required, although it might be used)	Limited or Confined	No overburden; collected from surface
100	Lynn Spring quarry	Medium	Moderately easy (extraction by ripping)	Extended	Limited reserve; overburden troublesome
101	Glacial Green #1	Medium	Moderately easy	Extended	Extensive reserves > 10 years

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IDNo	Name	Number_Products	Known_Products	Acres	Mining_Method	Hand_Methods
82	Red Canyon basalt Community pit	Small (1 - 2 products)	Crushed groundcover, landscape boulders	20	Mechanized	None
83	Silver Arrow Stone Co. (retail)	--	--	--	--	--
84	Brown's Canyon #1	Medium (3-5 products)	Block is hauled to saw plant in Heber; splits some into flagstone; tumbles some rock in own tumbler; crushes small amount but does not have own crusher plant	--	Hand-mechanized combined	Hand split, sort
85	Rosebud #1-2/Sage Green	Probable (3-5 Products)	Flagstone	--	Hand-mechanized combined	Hand split, sort
86	Goose Creek talus #2	Small (1 - 2 products)	Flagstone	5	Hand only	Surface collection
87	Dove Creek Pass outcrop	--	--	--	--	--
88	Goose Creek unnamed talus and pit	Small (1 - 2 products)	Flagstone	--	Hand only	Surface collection
89	Granite - 14N-17W-17	Small (1 - 2 products)	Flagstone, random slabs	--	Hand-mechanized combined	Hand split, sort
90	Buckskin	Medium (3-5 products)	Flagstone	3	Hand-mechanized combined	Hand split, sort
91	Cotton Thomas outcrop	--	--	--	--	--
92	Unnamed Gold Star	Medium (3-5 products)	3/4" flagstone, white, silvery due to mica; 1/"-2" flagstone, quartzite, silvery due to mica content; few boulder sizes	--	Hand-mechanized combined	Hand split, sort
93	Sawtooth (unnamed) main quarry	Medium (3-5 products)	Flagstone, large blocks	--	Hand-mechanized combined	Hand split, sort
94	Lone Pine (old pit)	Small (1 - 2 products)	Flagstone	2	Hand-mechanized combined	Hand split, sort
95	Lone Pine (new pit)	Medium (3-5 products)	3/4" standup qtzte flagstone; 1-1-1/2" patio stone flagstone; 4-6" ledge blocks of quartzite	5	Hand-mechanized combined	Hand split, sort
96	Autumn Gold	Medium (3-5 products)	1/2" flagstone, standup; 1" flagstone, 2-3" flagstone	20	Hand-mechanized combined	Hand split, sort
97	Aspen (DOGM's Cotton Thomas)	Medium (3-5 products)	Flagstone	--	Hand-mechanized combined	Hand split, sort
98	Gneiss-ridge line (reclaimed)	Small (1 - 2 products)	Random blocks, some are flaggy; some boulders	--	Hand-mechanized combined	Hand split, sort
99	Lynn Pass quarry	Small (1 - 2 products)	3/4"-2" flagstone; random slabs	3	Hand only	Surface collection
100	Lynn Spring quarry	Small (1 - 2 products)	Flagstone	8	Hand-mechanized combined	Hand split, sort
101	Glacial Green #1	Small (1 - 2 products)	Block (random) quartzite; flagstone	4	Hand-mechanized combined	Hand split, sort

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IDNo	Name	Mining_Description	Production_rate
82	Red Canyon basalt Community pit	Quarry	--
83	Silver Arrow Stone Co. (retail)	--	--
84	Brown's Canyon #1	--	--
85	Rosebud #1-2/Sage Green	Expose rock with excavator; hand sort and palletize	770 tons in 2001 (Mike Ford, Rosebud #1-2 CVD report)
86	Goose Creek talus #2	Surface gathering from talus; small pit at downhill side of talus	--
87	Dove Creek Pass outcrop	--	--
88	Goose Creek unnamed talus and pit	--	--
89	Granite - 14N-17W-17	Drill blast, dig with hydraulic excavator	--
90	Buckskin	Remove overburden with wheel loader, move rock to splitting area with hydraulic excavator; hand split, palletize	--
91	Cotton Thomas outcrop	--	--
92	Unnamed Gold Star	Remove with hyd. Excavator to splitting area 5 mile to NE	--
93	Sawtooth (unnamed) main quarry	Mine and move rock to splitting area with track excavator	--
94	Lone Pine (old pit)	--	--
95	Lone Pine (new pit)	Remove overbuden and mine rock and move to splitting area with track excavator	56 pallets/day, although not consistently; approx 1.8 tons/pallet
96	Autumn Gold	Remove overburden with wheel loader, move rock to splitting area with hydraulic excavator; hand split, palletize	--
97	Aspen (DOGM's Cotton Thomas)	Remove overburden with wheel loader, move rock to splitting area with hydraulic excavator; hand split, palletize	Depends on availability of crew
98	Gneiss-ridge line (reclaimed)	--	--
99	Lynn Pass quarry	Surface collection only	43 tons in 2004
100	Lynn Spring quarry	Drilling, blasting, and track excavator to remove overburden and valuable rock to splitting area	Proposes 700 tons/yr; laborers say 4-6 tons/day each; operator says hauls 6, 15-ton trucks/day to splitting area with 35% waste; calculating: 65%x6x15=58.5 tpd corresponds with 10 splitters x 5 tpd = 50 tpd total.
101	Glacial Green #1	Drill, blast, remove using hyd excavator, hand select and palletize	--

IDNo	Name	Processing_onsite	Work_schedule	Personnel	Buildings
82	Red Canyon basalt Community pit	Crush, screen, and load on trucks	--	--	--
83	Silver Arrow Stone Co. (retail)	--	--	--	--
84	Brown's Canyon #1	--	--	--	--
85	Rosebud #1-2/Sage Green	--	--	none on site; report says 9 splitters and 1 operator can produce 63 tons/day	None
86	Goose Creek talus #2	--	--	--	--
87	Dove Creek Pass outcrop	--	--	--	--
88	Goose Creek unnamed talus and pit	--	--	--	--
89	Granite - 14N-17W-17	--	--	--	--
90	Buckskin	Split, palletize	--	1 operator, 5 laborers (2004); 8 splitters, 1 foreman (SubTerra, 2002)	None
91	Cotton Thomas outcrop	--	--	--	--
92	Unnamed Gold Star	--	--	--	--
93	Sawtooth (unnamed) main quarry	Split, palletize	May-Oct, 6d/wk	1 operator; 15 laborers	--
94	Lone Pine (old pit)	--	--	--	--
95	Lone Pine (new pit)	splitting and palletizing; some rock moved to yard 6 mi to NE for splitting due to crowding	May-Oct; 6 days/wk	>10 laborers, 2 operators, 1 boss	--
96	Autumn Gold	Split and palletize	--	13 laborers, 2 operators	None
97	Aspen (DOGM's Cotton Thomas)	Split and palletize	--	Autumn Gold and Aspen workers are same and alternate between two pits	None
98	Gneiss-ridge line (reclaimed)	--	--	--	--
99	Lynn Pass quarry	none	3 trips per week from Farmington, UT	2 laborers	None
100	Lynn Spring quarry	split and palletize	May-Oct, 6d/week	10 splitters, 1 operator	None
101	Glacial Green #1	split and palletize		None on site	--

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IDNo	Name	Equipment	Product_inventory
82	Red Canyon basalt Community pit	--	--
83	Silver Arrow Stone Co. (retail)	--	--
84	Brown's Canyon #1	--	--
85	Rosebud #1-2/Sage Green	1, Komatsu track excavator; 2 Komatsu wheel loader; 1, D-8 CAT dozer; 2, dump trucks	pallet count: 12, 2in select standup flagstone; 85, 2-3in flagstone; 4, 3in ledgestone, total=101 (6-30-04); pallet count: 108, 2in sage green; 11, 3in sage green; 78, 4in ledgestone, 50, 2in select, 36, #1 stone, total=397 (10-24-02)
86	Goose Creek talus #2	--	--
87	Dove Creek Pass outcrop	--	--
88	Goose Creek unnamed talus and pit	--	--
89	Granite - 14N-17W-17	--	--
90	Buckskin	1, Komatsu WA600 wheel loader, articulated; 1 Komatsu 320 wheel loader, 1 track excavator; Ingersoll Rand compressor; airtrack drill; 1 bus	59 pallets on 8-3-04
91	Cotton Thomas outcrop	--	--
92	Unnamed Gold Star	--	8 pallets, large block, 8"x30"x4"; 11 pallets, 3/4" flagstone; 3 pallets, 1.5" flagstone
93	Sawtooth (unnamed) main quarry	1 track excavator, Cat ; Wheel loader Fiat Allis FR 15; 2 15-ton Autocar haul trucks (pictures)	9 pallets 2-4"; 79 pallets 3/4"-1" standup; 17 pallets, 1/2" flat; 60 pallets 1" flat; 25 pallets, 3" flat.
94	Lone Pine (old pit)	--	--
95	Lone Pine (new pit)	3 trucks, Autocar 12-ton (picture), 1 track excavator, 1 wheel loader MF 3cu yd (photo); small forklift Cat Rc60;	very little
96	Autumn Gold	1 Cat 992C Wheel loader, 1 Cat 690 ELC track excavator; 2 wheel loaders, 3-6 trailers, 1 Hitachi track excavator	lots-didn’t count
97	Aspen (DOGM's Cotton Thomas)	Use equipment fomr Autumn Gold; no additional	--
98	Gneiss-ridge line (reclaimed)	--	--
99	Lynn Pass quarry	Wheel tractor for loading	None
100	Lynn Spring quarry	1 Kato Iszo SE Excavator ($7,000 used, SubTerra, 2002), tracked; 1, Cat D08 dozer; 1 truck Peterbilt 12-ton, 10-wheel	A few pallets seen but did not count
101	Glacial Green #1	--	92 pallets of block quartzite, light green; 8 pallets of flagstone, green quartzite

IDNo	Name	Sales_price	Market_description	Destination
82	Red Canyon basalt Community pit	--	--	--
83	Silver Arrow Stone Co. (retail)	$260/t, N.Mex. Buff Ss standup; 240/t, Colorado red Ss; 180/t, Ash Fork pink oak, standup; 150/t, moss rock	--	--
84	Brown's Canyon #1	--	--	--
85	Rosebud #1-2/Sage Green	--	--	--
86	Goose Creek talus #2	--	--	--
87	Dove Creek Pass outcrop	--	--	--
88	Goose Creek unnamed talus and pit	--	--	--
89	Granite - 14N-17W-17	--	--	--
90	Buckskin	--	--	--
91	Cotton Thomas outcrop	--	--	--
92	Unnamed Gold Star	--	--	--
93	Sawtooth (unnamed) main quarry	--	--	--
94	Lone Pine (old pit)	--	--	--
95	Lone Pine (new pit)	--	--	--
96	Autumn Gold	--	--	--
97	Aspen (DOGM's Cotton Thomas)	--	--	--
98	Gneiss-ridge line (reclaimed)	--	--	--
99	Lynn Pass quarry	$200/ton	Local area	Farmington and Odgen
100	Lynn Spring quarry	$375/pallet or $185/tons for 3/4"-1" (highest price of Bown operations)	--	Corona, CA to Candee Enterprises
101	Glacial Green #1	--	--	--

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Prod_1995	Prod_1996	Prod_1997	Prod_1998	Prod_1999	Prod_2000	Prod_2001	Prod_2002	Prod_2003	Prod_2004	Max_prod
82	Red Canyon basalt Community pit											
83	Silver Arrow Stone Co. (retail)											
84	Brown's Canyon #1	30	NR	NR	NR	NR	10500	22240	23374	20000	17295	23374
85	Rosebud #1-2/Sage Green	1000	200	500	200	400	0	500	500	600	600	600
86	Goose Creek talus #2											
87	Dove Creek Pass outcrop											
88	Goose Creek unnamed talus and pit											
89	Granite - 14N-17W-17											
90	Buckskin											
91	Cotton Thomas outcrop											
92	Unnamed Gold Star											
93	Sawtooth (unnamed) main quarry									1500	3000	3000
94	Lone Pine (old pit)											
95	Lone Pine (new pit)				0	2227	5205	2500	NR	NR	2500	5205
96	Autumn Gold											
97	Aspen (DOGM's Cotton Thomas)	2000	1000	1000	600	2000	1184	1500	1500	2000	3000	3000
98	Gneiss-ridge line (reclaimed)											
99	Lynn Pass quarry										43	43
100	Lynn Spring quarry	1000	115	0	0	454	585	676	1027	798	2200	2200
101	Glacial Green #1			35	448	169	420	169	84	219	217	448

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Comments
82	Red Canyon basalt Community pit	--
83	Silver Arrow Stone Co. (retail)	Transportation cost $2/mi for semi truck w/flatbed
84	Brown's Canyon #1	In tons
85	Rosebud #1-2/Sage Green	See production col.
86	Goose Creek talus #2	--
87	Dove Creek Pass outcrop	No data
88	Goose Creek unnamed talus and pit	--
89	Granite - 14N-17W-17	Part of Cotton Thomas
90	Buckskin	Part of Cotton Thomas
91	Cotton Thomas outcrop	--
92	Unnamed Gold Star	Combined with Lone Pine
93	Sawtooth (unnamed) main quarry	--
94	Lone Pine (old pit)	Combined with Lone Pine (new)
95	Lone Pine (new pit)	See production column
96	Autumn Gold	Part of Cotton Thomas
97	Aspen (DOGM's Cotton Thomas)	--
98	Gneiss-ridge line (reclaimed)	Part of Cotton Thomas
99	Lynn Pass quarry	No data
100	Lynn Spring quarry	Proposes 700 tpy
101	Glacial Green #1	--

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Alt_Name	Location_State	Surface_Mgmt	Case_Type	Visited	Photos	Sampled	Date_Visit	Status
102	Fisher Creek quarry	--	UT	Salt Lake FO	Claims	No	No	No	Aug 2 2004	Explored
103	Raft River community pit	--	UT	Salt Lake FO	Community Pit	Yes	Yes	Yes	Aug 2 2004	Proposed
104	Grouse Creek Mountains quarry, lower end of talus	--	UT	Salt Lake FO	Claims	Yes	Yes	Yes	July 1 2004	Active
105	Grouse Creek Mountains quarry, upper end of talus	--	UT	Salt Lake FO	Claims	Yes	Yes	Yes	July 1 2004	Active
106	Grouse Creek Mountains quarry	--	UT	Salt Lake FO	Claims	No	No	No	July 1 2004	Active
107	Turquoise quarry	--	UT	Salt Lake FO	Claims	Yes	Yes	Yes	June 29 2004	Active
108	Limelight green quarry (state lease)	--	UT	State of Utah lease/Private	State of Utah lease	Yes	Yes	Yes	Jun 30 2004	Active
109	Green Peak	--	UT	Salt Lake FO	Claims	Yes	Yes	Yes	Jun 30 2004	Active
110	Rosebud Community pit	--	UT	Salt Lake FO	Community Pit	Yes	Yes	Yes	Jun 30 2004	Active
111	Sagers Dove Creek Pass quarry	--	UT	Salt Lake FO	Private	Yes	Yes	Yes	Jun 30 2004	Inactive
112	Dove Creek Pass trespass	--	UT	Salt Lake FO	Claims	Yes	Yes	Yes	Jun 30 2004	Inactive
113	Dove Creek Pass (State of Utah lease)	--	UT	State of Utah lease/Private	State of Utah lease	Yes	Yes	Yes	July 1 2004	Inactive
114	Lion Heart #1-#2	--	UT	Salt Lake FO	Claims	Yes	Yes	Yes	July 2 2004	Inactive
115	Kimbell Creek Community pit landscape rock area	--	UT	Salt Lake FO	Community Pit	Yes	Yes	Yes	July 23 2004	Active
116	Kimbell Creek Community pit tower area	--	UT	Salt Lake FO	Community Pit	Yes	Yes	Yes	July 23 2005	Active
117	Picture Rock (DOGM's Bullseye #1)	Bullseye #1	UT	Fillmore FO	Claims	Yes	Yes	Yes	Sept 17 2004	Active
118	Bandstone	--	UT	Fillmore FO	Claims	Yes	Yes	Yes	Sept 17 2004	Active
119	Pretty in Pink	--	UT	Fillmore FO	Claims	Yes	Yes	Yes	Sept 16 2004	Inactive

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Map_Name	Type_Site	Claim_Name	BLM_Case	SubTerra_Number	UT_DOGM_ID
102	Fisher Creek quarry	Park Valley 7.5 min	Quarry	Placer	UTU 0722871, 077766	s030027	s030027
103	Raft River community pit	Buck Hollow 7.5	Quarry, proposed	--	--	--	--
104	Grouse Creek Mountains quarry, lower end of talus	Kimbell Cr 7.5 minm	Quarry; collected from talus	Placer	UTU 072296	m030031	m030027
105	Grouse Creek Mountains quarry, upper end of talus	Kimbell Cr 7.5 minm	Quarry; collected from talus	Placer	UTU 072296	m030031	m030027
106	Grouse Creek Mountains quarry	Kimbell Cr 7.5 minm	Quarry; collected from talus	Placer	UTU 072296	m030031	m030027
107	Turquoise quarry	Rosette 7.5 min	Quarry	Turquoise Stone placer mining claim	UTU 069380	s030020	s030020
108	Limelight green quarry (state lease)	Emigrant Pass 7.5 min	Quarry	Placer	--	s030012	s030012
109	Green Peak	Emigrant Pass 7.5 min	Quarry	--	UTU-?	s030060	m030060
110	Rosebud Community pit	Emigrant Pass 7.5 min	Surface Collection only	--	UTU 072292	--	--
111	Sagers Dove Creek Pass quarry	Lynn Reservoir 7.5	Quarry	--	--	--	--
112	Dove Creek Pass trespass	Lynn Reservoir 7.5	Quarry	--	UTU 077041	s030052	s030052
113	Dove Creek Pass (State of Utah lease)	Lynn Reservoir 7.5	Quarry	--	--	--	m030016, s030047, s030019
114	Lion Heart #1-#2	Buck Hollow 7.5	Quarry	--	UTU 072299	s030032	s030033
115	Kimbell Creek Community pit landscape rock area	Kimbell Cr 7.5 minm	Surface collection only	--	UTU 064592	--	--
116	Kimbell Creek Community pit tower area	Kimbell Cr 7.5 minm	Surface collection only	--	UTU 064592	--	--
117	Picture Rock (DOGM's Bullseye #1)	Fish Springs 100k	Quarry	Placer	UTU 070643	s230031	s230031
118	Bandstone	Fish Springs 100k	Quarry	Placer	UTU 070644	UTU 070643	
119	Pretty in Pink	Wah Wah North 100k	Quarry	Placer	UTU 075878	s270073	s270073

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	UT_SITLA_ID	Data_Source	Operator_Name
102	Fisher Creek quarry	--	Bill Bown; SubTerra (2004); UT DOGM	Bonneville quarries, Bill Bown owner
103	Raft River community pit	--	Mike Ford, SLFO	Bureau of Land Management
104	Grouse Creek Mountains quarry, lower end of talus	--	Mike Ford, SLFO; Bill Bown; SubTerra (2004); UT DOGM	Bonneville quarries, Bill Bown owner
105	Grouse Creek Mountains quarry, upper end of talus	--	Mike Ford, SLFO; Bill Bown; SubTerra (2004); UT DOGM	Bonneville quarries, Bill Bown owner
106	Grouse Creek Mountains quarry	--	Mike Ford, SLFO; Bill Bown; SubTerra (2004); UT DOGM	Bonneville quarries, Bill Bown owner
107	Turquoise quarry	--	Mike Ford, SLFO; Darrel, site manager; SubTerra (2004); UT DOGM	Northern Stone Supply Co.
108	Limelight green quarry (state lease)	ML 43106	UT DOGM; Mike Ford, SLFO; Hugo, operator on site; SubTerra (2004); John Blake Utah SITLA	Northern Stone Supply Co.
109	Green Peak	--	Mike Ford, SLFO; Jose, operator; SubTerra (2004)	Heritage Stone, Dennis Jourgensen
110	Rosebud Community pit	--	Mike Ford, SLFO	Bureau of Land Management
111	Sagers Dove Creek Pass quarry	--	Mike Ford, SLFO	Sagers, J
112	Dove Creek Pass trespass	--	Mike Ford, SLFO; SubTerra (2004)	Bernard Rigby and Jeff Sagers
113	Dove Creek Pass (State of Utah lease)	ML 46649	Mike Ford, SLFO	Sagers, J.
114	Lion Heart #1-#2	--	Mike Ford, SLFO; UT DOGM	Star Stone, American Stone
115	Kimbell Creek Community pit landscape rock area	--	Mike Ford, SLFO	Bureau of Land Management
116	Kimbell Creek Community pit tower area	--	Mike Ford, SLFO	Bureau of Land Management
117	Picture Rock (DOGM's Bullseye #1)	--	Jerry Mansfield, Fillmore FO, case file; SubTerra (2004); UT DOGM	Lister, Edwin
118	Bandstone	--	Jerry Mansfield, Fillmore FO, case file; SubTerra (2004)	Lister, Edwin
119	Pretty in Pink	--	Case file; SubTerra (2004); UT DOGM	Penney, Dave, Penney's Gemstones

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Operator_Address	Operator_State	Operator_Tele	Location_Descr
102	Fisher Creek quarry	353 E 2200 S Bountiful UT 84010	UT	801-295-0601	Fisher Cr Canyon, S side of Raft River Range
103	Raft River community pit	--	UT	--	1 mi. S. of Raft River narrows
104	Grouse Creek Mountains quarry, lower end of talus	842 W 400 N W. Bountiful, UT 84087	UT	801-295-0601	Near top of ridge, Grouse Cr. Mtns.
105	Grouse Creek Mountains quarry, upper end of talus	842 W 400 N W. Bountiful, UT 84087	UT	801-295-0601	Near top of ridge, Grouse Cr. Mtns.
106	Grouse Creek Mountains quarry	842 W 400 N W. Bountiful, UT 84087	UT	801-295-0601	Near top of ridge, Grouse Cr. Mtns.
107	Turquoise quarry	PO Box 249 Oakley ID	UT	208-862-3353	Mouth of Rock Canyon, 5 mi N of Park Valley
108	Limelight green quarry (state lease)	PO Box 249 Oakley ID	UT	208-862-3353	--
109	Green Peak	Ogden	UT	801-388-9143; 801-732-1133; cell 801-391-9143	5 mi W on Emigrant Pass Rd from Hwy 30
110	Rosebud Community pit		UT	--	5 mi W on Emigrant Pass Rd from Hwy 30
111	Sagers Dove Creek Pass quarry	2016 S Montana Ave. Provo UT 84606	UT	--	Dove Creek Pass, then 1/2 mi N and NW along 2-track
112	Dove Creek Pass trespass	123 W 8865 S. #29 Sandy UT 84070	UT	801-377-5443	1 mi N and NW of Dove Creek Pass on 2 track
113	Dove Creek Pass (State of Utah lease)	2016 S Montana Ave. Provo UT 84606	UT	801-977-0380	1/2 mi S and W of Dove Cr pass on 2-track
114	Lion Heart #1-#2	Lon Thomas 4040 S 300 W Salt Lake City UT 84107	UT	801-262-4300	Raft River Narrows
115	Kimbell Creek Community pit landscape rock area	Kimbell Creek 2-track on W. side of Grouse Creek Mtns.	UT	--	Crest of Grouse Cr Mtns.
116	Kimbell Creek Community pit tower area	Kimbell Creek 2-track on W. side of Grouse Creek Mtns.	UT	--	Crest of Grouse Cr Mtns.
117	Picture Rock (DOGM's Bullseye #1)	PO Box 651 Delta UT	UT	435-864-2385	--
118	Bandstone	PO Box 651 Delta UT	UT	435-864-2385	--
119	Pretty in Pink	PO Box 312 Beaver UT 84713	UT	435-438-5522, 801-319-1727 cell	53 mi W of Milford UT, thn 5 mi SW on trail

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Location_County	Tp	Rg	Sec&Sub	Lat_dd	Long_dd	UTM_E	UTM_N	UTM_Zone	Coll_Method
102	Fisher Creek quarry	Box Elder	13 N	13 W	8 sw	41.8642	-113.3680	303460	4637200	12T	Recorded
103	Raft River community pit	Box Elder	14 N	16 W	17 sese	41.9352	-113.7008	276086	4646117	12T	Recorded
104	Grouse Creek Mountains quarry, lower end of talus	Box Elder	13 N	17 W	34 se	41.8021	-113.7781	269198	4631320	12T	Recorded
105	Grouse Creek Mountains quarry, upper end of talus	Box Elder	13 N	17 W	35 sw	41.8008	-113.7717	269717	4631167	12T	Recorded
106	Grouse Creek Mountains quarry	Box Elder	12 N	17 W	3 nene	41.7962	-113.7725	269640	4630660	12T	Recorded
107	Turquoise quarry	Box Elder	13 N	13 W	18 nw	41.8545	-113.3781	302598	4636356	12T	Read from ArcMap
108	Limelight green quarry (state lease)	Box Elder	10 N	16 W	2 sese	41.6143	-113.6352	280429	4610091	12T	Recorded
109	Green Peak	Box Elder	10 N	16 W	11 sesw	41.5990	-113.6487	279248	4608433	12T	Recorded
110	Rosebud Community pit	Box Elder	10 N	16 W	14 e2	41.5955	-113.6400	279974	4608028	12T	Recorded
111	Sagers Dove Creek Pass quarry	Box Elder	13 N	16 W	22 swsw	41.8310	-113.6750	277868	4634362	12T	Recorded
112	Dove Creek Pass trespass	Box Elder	13 N	16 W	21 e2se	41.8330	-113.6773	277679	4634496	12T	Recorded
113	Dove Creek Pass (State of Utah lease)	Box Elder	13 N	16 W	27 swnw	41.8240	-113.6760	277752	4633492	12T	Recorded
114	Lion Heart #1-#2	Box Elder	14 N	16 W	8 sesw, 17 nenw	41.9462	-113.7123	275174	4647360	12T	Recorded
115	Kimbell Creek Community pit landscape rock area	Box Elder	13 N	17 W	26 nw	41.8273	-113.7705	269921	4634163	12T	Recorded
116	Kimbell Creek Community pit tower area	Box Elder	14 N	18 W	23 sw	41.8307	-113.7670	270219	4634467	12T	Recorded
117	Picture Rock (DOGM's Bullseye #1)	Juab	14 S	11 W	13 ne	39.5648	-113.0863	320767	4381546	12S	Recorded
118	Bandstone	Juab	14 S	11 W	34 nw	39.5671	-113.0787	321439	4381772	12S	Recorded
119	Pretty in Pink	Millard	25 S	19 W	24 sw	38.6178	-113.9302	244892	4278444	12S	Recorded

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Color	Geology	Generalized_Rock_Unit
102	Fisher Creek quarry	Turquoise green	Elba Quartzite (pC)	ElbaQtz_pC
103	Raft River community pit	Light gray	Quartzite of Clarks Basin (Cambrian)	Qtzte_ClarksBasin
104	Grouse Creek Mountains quarry, lower end of talus	Medium brown	Elba Quartzite (pC)	ElbaQtz_pC
105	Grouse Creek Mountains quarry, upper end of talus	Medium brown	Elba Quartzite (pC)	ElbaQtz_pC
106	Grouse Creek Mountains quarry	Medium brown	Elba Quartzite (pC)	ElbaQtz_pC
107	Turquoise quarry	Turquoise green	Elba Quartzite (pC)	ElbaQtz_pC
108	Limelight green quarry (state lease)	Light greenish gray	Quartzite of Clarks Basin (Cambrian)	Qtzte_ClarksBasin
109	Green Peak	Light green	Quartzite of Clarks Basin (Cambrian)	Qtzte_ClarksBasin
110	Rosebud Community pit	Light gray	Quartzite of Clarks Basin (Cambrian)	Qtzte_ClarksBasin
111	Sagers Dove Creek Pass quarry	White	Quartzite of Clarks Basin (Cambrian)	Qtzte_ClarksBasin
112	Dove Creek Pass trespass	White	Eureka Quartzite (Ordo.)	Eureka_Ordo
113	Dove Creek Pass (State of Utah lease)	White	Quartzite of Clarks Basin (Cambrian)	Qtzte_ClarksBasin
114	Lion Heart #1-#2	Light gray	Quartzite of Yost (Pre-Cambrian)	Qtzte_Yost
115	Kimbell Creek Community pit landscape rock area	Gray	Elba Quartzite (pC)	ElbaQtz_pC
116	Kimbell Creek Community pit tower area	Gray	Elba Quartzite (pC)	ElbaQtz_pC
117	Picture Rock (DOGM's Bullseye #1)	Light brown-Red	--	--
118	Bandstone	Greenish gray	--	--
119	Pretty in Pink	White-Red	--	--

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Lithologic_Description	Generalized_Lithology
102	Fisher Creek quarry	Quartzite, flaggy to massive, light green (coloration probably due to Cr-mica)	Quartzite
103	Raft River community pit	Quartzite flagstone, 1/2"-1" slabs, light gray to white, partly micaceous which contributes to slabby character	Quartzite
104	Grouse Creek Mountains quarry, lower end of talus	Quartzite flagstone and blocks, white, stained by iron oxide to medium-med. Dark brown color	Quartzite
105	Grouse Creek Mountains quarry, upper end of talus	Quartzite flagstone and blocks, white, stained by iron oxide to medium-med. Dark brown color	Quartzite
106	Grouse Creek Mountains quarry	Quartzite flagstone and blocks, white, stained by iron oxide to medium-med. Dark brown color	Quartzite
107	Turquoise quarry	Quartzite, light greeen color, very hard, mica partings rare	Quartzite
108	Limelight green quarry (state lease)	Quartzite flagstone, medium green due to small pct of chlorite	Quartzite
109	Green Peak	Quartzite, 1"-4", flagstone, light green due to small amount of chlorite	Quartzite
110	Rosebud Community pit	Quartzite, flagstone, micaceous, hard, v poor quality	Quartzite
111	Sagers Dove Creek Pass quarry	Quartzite, white, hard, flaggy, with mica partings at .5-1.5"	Quartzite
112	Dove Creek Pass trespass	Quarzite, white	Quartzite
113	Dove Creek Pass (State of Utah lease)	Quartzite shist, occ. micaceous partings and stringers	Quartzite
114	Lion Heart #1-#2	Quartzite, white, hard minor iron oxide, minor white muscovite schist partings	Quartzite
115	Kimbell Creek Community pit landscape rock area	Quartzite flagstone, hard, splits to 1" to 6" thicknesses	Quartzite
116	Kimbell Creek Community pit tower area	Quartzite flagstone, hard, light brown, 3/4-2" partings	Quartzite
117	Picture Rock (DOGM's Bullseye #1)	Rhyolite, banded, unwelded, called "Picture Rock" or "Wonderstone"	Rhyolite
118	Bandstone	Volcanic rock, opalized with soft green opal vein	Volcanic
119	Pretty in Pink	Limestone (Paleozoic), hydrothermally altered giving banded red alternating with white bands, 1 cm to 20 cm thick; coloration may be due to rhodochrosite; Color banding; material is very soft calcite and softer than original limestone	Limestone

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IDNo	Name	Other_characteristics	Extraction_Fractures_Cleavability	Product_Dimension_Fractures_Cleavability
102	Fisher Creek quarry	Brilliant, near irridescent green color is prominent through strata in part of mine	Favorable with respect to extraction	Favorable with respect to product dimensions.
103	Raft River community pit	Thin, durable, hard sheets of quartzite are widely available although somewhat sparse	Favorable with respect to extraction	Favorable with respect to product dimensions.
104	Grouse Creek Mountains quarry, lower end of talus	Occurs on talus and can be gathered and palleted by hand without use of equipment	Favorable with respect to extraction	Favorable with respect to product dimensions.
105	Grouse Creek Mountains quarry, upper end of talus	Occurs on talus and can be gathered and palleted by hand without use of equipment	Favorable with respect to extraction	Favorable with respect to product dimensions.
106	Grouse Creek Mountains quarry	Occurs on talus and can be gathered and palleted by hand without use of equipment	--	--
107	Turquoise quarry	Brilliant, near irridescent green color is prominent through strata in part of mine	Favorable with respect to extraction	Favorable with respect to product dimensions.
108	Limelight green quarry (state lease)	Hard and durable	Favorable with respect to extraction	Favorable with respect to product dimensions.
109	Green Peak	Very hard an d durable	Favorable with respect to extraction	Unfavorable with respect to product dimensions
110	Rosebud Community pit	Nearly all material has been removed	Favorable with respect to extraction	Favorable with respect to product dimensions.
111	Sagers Dove Creek Pass quarry	High rock strength even in very thin sheets	Favorable with respect to extraction	Favorable with respect to product dimensions.
112	Dove Creek Pass trespass	--	Favorable with respect to extraction	Favorable with respect to product dimensions.
113	Dove Creek Pass (State of Utah lease)	--	Favorable with respect to extraction	Favorable with respect to product dimensions.
114	Lion Heart #1-#2	--	Unfavorable with respect to extraction	Unfavorable with respect to product dimensions
115	Kimbell Creek Community pit landscape rock area	Material for collection is very widespread	Favorable with respect to extraction	Favorable with respect to product dimensions.
116	Kimbell Creek Community pit tower area	Material is widely available for collection	Favorable with respect to extraction	Favorable with respect to product dimensions.
117	Picture Rock (DOGM's Bullseye #1)	Very soft through most of quarry; rock has little strength	Not Applicable.	Unfavorable with respect to product dimensions
118	Bandstone	Very soft through most of quarry; rock has little strength	Not Applicable.	Favorable with respect to product dimensions.
119	Pretty in Pink	Very soft, nearly plastic-like consistency; no strength	Not Applicable.	Unfavorable with respect to product dimensions

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IDNo	Name	Influence_of_Texture	Uniform_Thickness	Lithology_Hardness_Durability	Rock_Quality_Suitability
102	Fisher Creek quarry	No Influence	Yes	Advantageous	
103	Raft River community pit	Likely influence	Yes	Moderately Advantageous	Excellent
104	Grouse Creek Mountains quarry, lower end of talus	Likely influence	Yes	Advantageous	Excellent shape, color, and texture
105	Grouse Creek Mountains quarry, upper end of talus	Likely influence	Yes	Advantageous	Excellent shape, color, and texture
106	Grouse Creek Mountains quarry	--	--	--	--
107	Turquoise quarry	No Influence	No	Advantageous	Good quality; unusual green color
108	Limelight green quarry (state lease)	No Influence	Yes	Advantageous	Hard, fissile, readily splits into flagstone
109	Green Peak	No Influence	Yes	Advantageous	Fair to good quality
110	Rosebud Community pit	No Influence	No	Moderately Advantageous	Reserve is exhausted
111	Sagers Dove Creek Pass quarry	Likely influence	Yes	Advantageous	Excellent
112	Dove Creek Pass trespass	Likely influence	Yes	Advantageous	Fissile, readily splits into flagstone
113	Dove Creek Pass (State of Utah lease)	Likely influence	Yes	Advantageous	Unknown
114	Lion Heart #1-#2	No Influence	No	Disadvantageous	Little product available
115	Kimbell Creek Community pit landscape rock area	Likely influence	Yes	Moderately Advantageous	Excellent shape, color, and texture
116	Kimbell Creek Community pit tower area	Likely influence	Yes	Moderately Advantageous	Excellent shape, color, and texture
117	Picture Rock (DOGM's Bullseye #1)	Likely influence	No	Advantageous	Limited durability for flagstone
118	Bandstone	Likely influence	No	Moderately Advantageous	Only a part of rock is durable
119	Pretty in Pink	No Influence	No	Advantageous	Durable for landscape rock

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IDNo	Name	Size	Ease_of_Extraction	Extent_of_Deposit	Reserve_Limits_Overburden
102	Fisher Creek quarry	Small	Moderately Easy (extraction by ripping)	Limited or Confined	Large reserve > 10 years, readily accessible
103	Raft River community pit	Small-Material site	Very easy (no mechanized equipment required, although it might be used)	Limited or Confined	No overburden
104	Grouse Creek Mountains quarry, lower end of talus	Medium	Moderately difficult	Extended	Little overburden; near unlimited reserve
105	Grouse Creek Mountains quarry, upper end of talus	Large	Moderately difficult	Extended	Little overburden; near unlimited reserve
106	Grouse Creek Mountains quarry	Small	--	--	--
107	Turquoise quarry	Large	Moderately difficult (blasting likely required, or extraction otherwise made difficult through extensive overburden, unfavorable structure, etc.)	Limited or Confined	Large reserve > 10 years, readily accessible
108	Limelight green quarry (state lease)	Large	Moderately easy (extraction by ripping)	Extended	Extensive reserves > 10 years
109	Green Peak	Medium	Moderately easy (extraction by ripping)	Extended	Limited reserves, discontinuous minable areas
110	Rosebud Community pit	Small-Material site	Very easy (no mechanized equipment required, although it might be used)	Limited or Confined	No overburden
111	Sagers Dove Creek Pass quarry	Medium	Very easy (no mechanized equipment required, although it might be used)	Extended	No overburden
112	Dove Creek Pass trespass	Small	Moderately easy (extraction by ripping)	Extended	Limited reserve
113	Dove Creek Pass (State of Utah lease)	Medium	Moderately easy	Limited or Confined	Extensive reserves > 10 years
114	Lion Heart #1-#2	Medium	Moderately difficult	Little or no reserve	Unknown reserve
115	Kimbell Creek Community pit landscape rock area	Small-Material site	Very easy (no mechanized equipment required, although it might be used)	Extended	No overburden
116	Kimbell Creek Community pit tower area	Small-Material site	Very easy (no mechanized equipment required, although it might be used)	Limited or Confined	No overburden
117	Picture Rock (DOGM's Bullseye #1)	Small	Moderately difficult (blasting likely required, or extraction otherwise made difficult through extensive overburden, unfavorable structure, etc.)	Extended	Extensive reserves > 10 years
118	Bandstone	Small	Moderately easy	Surficial	Few hundred tons
119	Pretty in Pink	Small	Difficult (blasting required under confined or otherwise difficult conditions).	Limited or Confined	Unknown reserve

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Number_Products	Known_Products	Acres	Mining_Method	Hand_Methods
102	Fisher Creek quarry	Small (1 - 2 products)	Random stone and ledge stone	-1	Hand-mechanized combined	Hand split, sort
103	Raft River community pit	Small (1 - 2 products)	Flagstone	--	Hand only	Surface collection
104	Grouse Creek Mountains quarry, lower end of talus	Medium (3-5 products)	Quartzite block and flagstone	--	Hand only	Surface collection
105	Grouse Creek Mountains quarry, upper end of talus	Medium (3-5 products)	Quartzite block and flagstone	--	Hand only	Surface collection
106	Grouse Creek Mountains quarry	--	Quartzite block and flagstone	--	Hand only	Surface collection
107	Turquoise quarry	Large (>5 products)	Flagstone (>4-8 in. thickness), ledgestone, crushed rock products	--	Hand-mechanized combined	Hand split, sort
108	Limelight green quarry (state lease)	Large (>5 products)	Flagstone	--	Hand-mechanized combined	Hand split, sort
109	Green Peak	Medium (3-5 products)	Flagstone, railraod ballast	--	Hand-mechanized combined	Hand split, sort
110	Rosebud Community pit	Small (1 - 2 products)	Random blocks	--	Hand only	Surface collection
111	Sagers Dove Creek Pass quarry	Medium (3-5 products)	Flagstone	--	Hand-mechanized combined	Hand split, sort
112	Dove Creek Pass trespass	Medium (3-5 products)	Flagstone	--	Mechanized	None
113	Dove Creek Pass (State of Utah lease)	Small (1 - 2 products)	Flagstone, random blocks	--	Hand-mechanized combined	Hand split, sort
114	Lion Heart #1-#2	Small (1 - 2 products)	Random blocks	--	Hand-mechanized combined	Hand split, sort
115	Kimbell Creek Community pit landscape rock area	Small (1 - 2 products)	Flagstone	--	Hand only	Surface collection
116	Kimbell Creek Community pit tower area	Small (1 - 2 products)	Flagstone	--	Hand only	Surface collection
117	Picture Rock (DOGM's Bullseye #1)	Small (1 - 2 products)	Landscape rock	3	Hand-mechanized combined	Hand split, sort
118	Bandstone	Small (1 - 2 products)	Banded stone due to liesegang banding	0.5	Hand-mechanized combined	Hand split, sort
119	Pretty in Pink	Small (1 - 2 products)	Landscape rock	0.5	Hand-mechanized combined	Hand split, sort

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IDNo	Name	Mining_Description	Production_rate
102	Fisher Creek quarry	Explored--Permitting process underway	--
103	Raft River community pit	Surface collection only	--
104	Grouse Creek Mountains quarry, lower end of talus	Surface collection from talus and load on trucks	6 pallets/day from three "Grouse Creek" sites or 2 to 3 semi-truck loads per week (16 pallets each) X 2 tons/pallet = 2.5 tr. X 16 x 2 = 80 tons/week
105	Grouse Creek Mountains quarry, upper end of talus	Surface collection from talus and load on trucks	6 pallets/day from three "Grouse Creek" sites or 2 to 3 semi-truck loads per week (16 pallets each) X 2 tons/pallet = 2.5 tr. X 16 x 2 = 80 tons/week
106	Grouse Creek Mountains quarry	Surface collection from talus and load on trucks	6 pallets/day from three "Grouse Creek" sites or 2 to 3 semi-truck loads per week (16 pallets each) X 2 tons/pallet = 2.5 tr. X 16 x 2 = 80 tons/week
107	Turquoise quarry	Drill, blast, remove using hyd excavator, hand select and palletize	--
108	Limelight green quarry (state lease)	Extract using hyd excavator and move to splitting area	3 men x 1.5 pallets/d each x 2 t/pall = 9 tons/d x 6.5 d/wk = 58.5 t/wk x 26 wx = 1521 ton yr
109	Green Peak	Excavate and load trucks with hyd excavator	8 men x 3 to 5 pallets/d/worker x 6 d/wk x 26 wk x 2t/pall = 3744 t/yr; 1 to 5 trucks shipped per wk: average 3 trucks/wk x12 pallets x2t/pallet x 26 = 1872 tons
110	Rosebud Community pit	Surface collection only	--
111	Sagers Dove Creek Pass quarry	Dig with excavator	--
112	Dove Creek Pass trespass	--	--
113	Dove Creek Pass (State of Utah lease)	--	1690 tons in 2000
114	Lion Heart #1-#2	Dig with hyd excavator	--
115	Kimbell Creek Community pit landscape rock area	Surface collection only	--
116	Kimbell Creek Community pit tower area	Surface collection only	--
117	Picture Rock (DOGM's Bullseye #1)	Dig with hyd excavator	Plan: 50 tons/yr
118	Bandstone	Dig with hyd excavator	--
119	Pretty in Pink	Blasting, then dig with hyd excavator	--

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Processing_onsite	Work_schedule	Personnel	Buildings
102	Fisher Creek quarry	--	--	None on site	--
103	Raft River community pit	--	--	--	--
104	Grouse Creek Mountains quarry, lower end of talus	--	6 days/wk	4 laborers	--
105	Grouse Creek Mountains quarry, upper end of talus	--	6 days/wk	4 laborers	--
106	Grouse Creek Mountains quarry	--	6 days/wk	4 laborers	--
107	Turquoise quarry	--	6.5 days/wk, Apr-Oct	7 laborers, 1 foreman 2d/wk	--
108	Limelight green quarry (state lease)	--	6.5 d/wk	3 laborers, 1 operator	--
109	Green Peak	--	--	1 operator, 8 laborers	--
110	Rosebud Community pit	--	--	None on site	--
111	Sagers Dove Creek Pass quarry	--	--	None on site	--
112	Dove Creek Pass trespass	--	--	None on site	--
113	Dove Creek Pass (State of Utah lease)	--	--	None on site	--
114	Lion Heart #1-#2	--	--	None on site	--
115	Kimbell Creek Community pit landscape rock area	--	--	--	--
116	Kimbell Creek Community pit tower area	--	--	--	--
117	Picture Rock (DOGM's Bullseye #1)	Hand sort	Irregular		--
118	Bandstone	--	--	--	--
119	Pretty in Pink	--	--	--	--

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Equipment	Product_inventory
102	Fisher Creek quarry	--	--
103	Raft River community pit	--	--
104	Grouse Creek Mountains quarry, lower end of talus	2, army flatbed 12-ton trucks; two 20-ft trailer houses	36 pallets of block 1"-4" size
105	Grouse Creek Mountains quarry, upper end of talus	2, army flatbed 12-ton trucks; two 20-ft trailer houses	36 pallets of block 1"-4" size
106	Grouse Creek Mountains quarry	2, army flatbed 12-ton trucks; two 20-ft trailer houses	36 pallets of block 1"-4" size
107	Turquoise quarry	crusher, screens, conveyors (pictures), 2 wheel excavators: Hitachi ES450 MTH and Cat E200B; 1 wheel loader volvo BN; 1 wheel loader Volvo L70C; 1 wheel excavator Volvo EM180B; 1 fuel truck; 1 GMC dump truck	95 pallets of large angular green boulders; 42 pallets angular buff colored Mn stained cobbles; 22 pallets of quartzite flagstone 2"-4" thick; 126 pallets of buff-gray quartzite boulders; 28 pallets of 4"-6" green quartzite flagstone; 52 pallets of angular 2x2x6" green quartzite cobbles; 32 pallets of mixed buff and green 2x4x6 cobbles
108	Limelight green quarry (state lease)	1 wheel excavator; 1 hyd excavator; 1 van for supplies; lots of pallets, hogwire, strappign	67 pallets, 3/4" flagstone, "LL" E2"; 5 pallets of 1" flagstone; 60 pallets of 3-5" flagstone ledge, "LL"; 172 of 7/8-1.5" flagstone; and 22 pallets of minus 7/8" flagstone upright;
109	Green Peak	1 hyd excavator Daewoo 290; 1, wheel loader Hyundai H740-3, 1, dump truck, 8-ton	Silver Sage: 22 pallets of 1-2" patio flagstone qtzte; 18 pallets of 2" patio, large, upright; 12 pallets of 1" flagstone upright; 60 pallets of 2" stepping stone, flagstone: 18 pallets of 7" ledgestone; 20 pallets of 1.5" very broad, standup.
110	Rosebud Community pit	--	--
111	Sagers Dove Creek Pass quarry	--	--
112	Dove Creek Pass trespass	--	--
113	Dove Creek Pass (State of Utah lease)	--	4 pallets, 2" patio quartzite; 6 pallets of ledgestone quartzite; 2 pallets of 3/4"-1" flagstone, upright
114	Lion Heart #1-#2	--	--
115	Kimbell Creek Community pit landscape rock area	--	--
116	Kimbell Creek Community pit tower area	--	--
117	Picture Rock (DOGM's Bullseye #1)	Plan: track excavator	None
118	Bandstone	--	--
119	Pretty in Pink	--	--

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IDNo	Name	Sales_price	Market_description	Destination
102	Fisher Creek quarry	--	--	--
103	Raft River community pit	--	--	--
104	Grouse Creek Mountains quarry, lower end of talus	--	--	Yard at Park Valley, about 20 mi E
105	Grouse Creek Mountains quarry, upper end of talus	--	--	Yard at Park Valley, about 20 mi E
106	Grouse Creek Mountains quarry	--	--	Yard at Park Valley, about 20 mi E
107	Turquoise quarry	--	--	--
108	Limelight green quarry (state lease)	Desert antique (retail): 1/4-5/8" and 1-2", $250/t; 2-4", 175/t; 1/4-3/4"	--	--
109	Green Peak	--	--	Ship to yard in Ogden
110	Rosebud Community pit	appraisal price $9/ton	--	--
111	Sagers Dove Creek Pass quarry	--	--	--
112	Dove Creek Pass trespass	--	--	--
113	Dove Creek Pass (State of Utah lease)	--	--	--
114	Lion Heart #1-#2	--	--	--
115	Kimbell Creek Community pit landscape rock area	--	--	--
116	Kimbell Creek Community pit tower area	--	--	--
117	Picture Rock (DOGM's Bullseye #1)	--	--	--
118	Bandstone	--	--	--
119	Pretty in Pink	--	--	--

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IDNo	Name	Prod_1995	Prod_1996	Prod_1997	Prod_1998	Prod_1999	Prod_2000	Prod_2001	Prod_2002	Prod_2003	Prod_2004	Max_prod
102	Fisher Creek quarry	0	10	0	0	0	0	0	0	0	0	
103	Raft River community pit											
104	Grouse Creek Mountains quarry, lower end of talus	100	0	0	200	50	383	1362	NR	935		1362
105	Grouse Creek Mountains quarry, upper end of talus											
106	Grouse Creek Mountains quarry	100	0	0	200	50	353	1362	1207	936	1036	1362
107	Turquoise quarry	700	0	2300	1200	1500	1000	2000	2500	1500	2500	2500
108	Limelight green quarry (state lease)	Confid.	Confid.	Confid.	1824	1352	2396	2062	1756	1792	1548	2396
109	Green Peak						0	NR	NR	NR	3500	3500
110	Rosebud Community pit											0
111	Sagers Dove Creek Pass quarry											0
112	Dove Creek Pass trespass						0	NR	NR	NR	NR	0
113	Dove Creek Pass (State of Utah lease)				1800	831	1459	1600	1551	1525	300	1800
114	Lion Heart #1-#2	500	1	10	1	1	0	0	0	0	0	1
115	Kimbell Creek Community pit landscape rock area											
116	Kimbell Creek Community pit tower area											
117	Picture Rock (DOGM's Bullseye #1)	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
118	Bandstone											
119	Pretty in Pink				NR	NR	0	0.5	1	1	1	1

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IDNo	Name	Comments
102	Fisher Creek quarry	--
103	Raft River community pit	--
104	Grouse Creek Mountains quarry, lower end of talus	Any one of these three operations will operate at one time, but not simultaneously see production col.
105	Grouse Creek Mountains quarry, upper end of talus	Any one of these three operations will operate at one time, but not simultaneously see production col.
106	Grouse Creek Mountains quarry	Any one of these three operations will operate at one time, but not simultaneously see production col.
107	Turquoise quarry	Production at RIGHT are based on data provided to Office of Solicitor on March 2, 2005;
108	Limelight green quarry (state lease)	Minable resource of 16 million tons excludes waster SITLA production data is CONFIDENTIAL for 2003-2004; DOGM and SITLA production quantities in agreement
109	Green Peak	--
110	Rosebud Community pit	--
111	Sagers Dove Creek Pass quarry	Part of State of Utah quarry-Dove Cr. Pass
112	Dove Creek Pass trespass	--
113	Dove Creek Pass (State of Utah lease)	SITLA production data here is CONFIDENTIAL; DOGM data combined from 3 permitted operations
114	Lion Heart #1-#2	--
115	Kimbell Creek Community pit landscape rock area	--
116	Kimbell Creek Community pit tower area	--
117	Picture Rock (DOGM's Bullseye #1)	--
118	Bandstone	--
119	Pretty in Pink	--

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Alt_Name	Location_State	Surface_Mgmt	Case_Type	Visited	Photos	Sampled	Date_Visit	Status
120	Drum slate quarry	--	UT	Fillmore FO	Material site	Yes	Yes	Yes	Sept 17 2004	Inactive
121	RMS No. 1 Mtn.Spring Peak	--	UT	Cedar City FO	Claims	Yes	Yes	Yes	May 11 2004	Inactive
122	Bright quarry	--	UT	Cedar City FO	Material site	Yes	Yes	Yes	May 12 2004	Active
123	Red Beryl quarry (aka Ruby Violet)	Ruby Violet	UT	Cedar City FO	Claims	Yes	Yes	Yes	May 11 2004	Active
124	Hiltop	--	UT	Cedar City FO	Claims	Yes	Yes	Yes	May 11 2004	Active
125	Rhyolite (aka Color Country Rock)	--	UT	Cedar City FO	Material site	Yes	Yes	Yes	May 12 2004	Inactive
126	Star Range Dolomite	--	UT	Cedar City FO	Material site	Yes	Yes	Yes	May 12 2004	Inactive
127	White Elephant	Trees	UT	Cedar City FO	Claims	Yes	Yes	Yes	May 11 2004	Inactive
128	Picasso	--	UT	Cedar City FO	Claims	Yes	Yes	Yes	May 12 2004	Active
129	Oyster Ridge Comm. Pit	--	WY	Kemmerer FO	Community Pit	Yes	Yes	Yes	Sept 27 2004	Active
130	Cumberland Gap Hearth Stone	--	WY	Kemmerer FO	Claims	Yes	Yes	Yes	Sept 27 2004	Active
131	Cumberland Gap Hearth Stone (yard)	--	WY	Kemmerer FO	Claims	Yes	Yes	No	Sept 27 2004	Active
132	Severns Stone (yard)	--	WY	Kemmerer FO	Private	Yes	Yes	No	Sept 27 2004	Active
133	Wyoming Stone	--	WY	Kemmerer FO	Claims	Yes	Yes	Yes	Sept 27 2004	Active
134	Bear Lake Community Pit	--	ID	Pocatello FO	Community Pit	Yes	Yes	Yes	Sept 27 2004	Inactive
135	Maad Mountain Common Use area	Desert Varnish	ID	Idaho Falls FO	Common use	Yes	Yes	Yes	Sept 28 2004	Active
136	Hells Half Acre Commun. Pit	--	ID	Idaho Falls FO	Community Pit	Yes	Yes	Yes	Sept 29 2004	Active
137	Lyle Thompson Thornton (yard)	--	ID	Idaho Falls FO	Private	Yes	Yes	No	Sept 29 2004	Active
138	Tin Cup Mine	--	ID	Targhee NF	Claims	Yes	Yes	Yes	Sept 28 2004	Active
139	Tin Cup Millsite	--	ID	Targhee NF	Mill site	Yes	Yes	No	Sept 28 2004	Active

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IDNo	Name	Map_Name	Type_Site	Claim_Name	BLM_Case	SubTerra_Number	UT_DOGM_ID
120	Drum slate quarry	Lynndyl 100K	Quarry	Placer	UTU 078296	s78296	s230072
121	RMS No. 1 Mtn.Spring Peak	Wah Wah Mtns. South 100 k	Quarry	Sagers UTU 074031	UTU 074031	UTU 074031	s210024
122	Bright quarry	Cedar City 100 k	Quarry	--	UTU 079703	s210030	m210030
123	Red Beryl quarry (aka Ruby Violet)	Wah Wah South 100 k	Quarry	Lode	UTU 077232	--	m001045
124	Hiltop	Cedar City 100 k	Quarry	--	UTU 072785	E/001/102	E001102
125	Rhyolite (aka Color Country Rock)	Cedar City 100 k	Quarry	--	UTU 079327	s021032	s210032
126	Star Range Dolomite	Cedar City 100 k	Quarry	--	UTU 080512	--	s010065
127	White Elephant	Beaver 100 k	Quarry	Placer	UTU 072213	UTU 072213	S001037
128	Picasso	Beaver 100 k	Quarry	Sliver claims	UTU 071326	UTU 071326	S001057
129	Oyster Ridge Comm. Pit	Kemmerer 100K	Surface collection only	--	--	--	--
130	Cumberland Gap Hearth Stone	Kemmerer 100K	Quarry	--	WYW 127360	--	--
131	Cumberland Gap Hearth Stone (yard)	Kemmerer 100K	Yard	--	WYW 127360	--	--
132	Severns Stone (yard)	Kemmerer 100K	Yard, retail	--	--	--	--
133	Wyoming Stone	Kemmerer 100K	Surface collection only from large area of talus	--	--	--	--
134	Bear Lake Community Pit	Peagram Creek 7.5-min	Quarry	--	IDI 024585	--	--
135	Maad Mountain Common Use area	Dubois 100K	Surface collection only from large area of talus	--	--	--	--
136	Hells Half Acre Commun. Pit	Blackfoot 100k	Surface collection only from large area of talus	--	--	--	--
137	Lyle Thompson Thornton (yard)	Rexburg 100k	Yard, retail		--	--	--
138	Tin Cup Mine	Mt. Jefferson 7.5-min; Hebgen Lake 100K	Quarry	Tin Cup claims	--	--	--
139	Tin Cup Millsite	Mt. Jefferson 7.5-min; Hebgen Lake 100K	Yard	Tin Cup claims	--	--	--

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	UT_SITLA_ID	Data_Source	Operator_Name
120	Drum slate quarry	--	Case file; SubTerra (2004)	Crapo, Shayne
121	RMS No. 1 Mtn.Spring Peak	--	Ed Genouves Cedar City FO; SubTerra (2004)	Smith, Kent, Milford UT , Feller Stone Veyo UT
122	Bright quarry	--	Ed Genouves Cedar City FO; SubTerra (2004); UT DOGM	Bradshaw, Neil/3-H Landscape
123	Red Beryl quarry (aka Ruby Violet)	--	Ed Genouves Cedar City FO; UT DOGM	Day, Ron, operator, Delta UT; Clint Christenson, permit lead, ; owners marlow Cropper and Rex Harris, Delta UT
124	Hiltop	--	Ed Genouves Cedar City FO; UT DOGM	Bradshaw, Neil/3-H Landscape
125	Rhyolite (aka Color Country Rock)	--	Ed Genouves Cedar City FO	Color Country Rock Preston (Lonny) Hafen
126	Star Range Dolomite	--	Ed Genouves Cedar City FO	Western Clay
127	White Elephant	--	Ed Genouves Cedar City FO; SubTerra (2004); UT DOGM	Bradshaw, Neil/3-H Landscape
128	Picasso	--	Ed Genouves Cedar City FO; SubTerra (2004); UT DOGM	Penney, Dave, Penney's Gemstones
129	Oyster Ridge Comm. Pit	--	Gary McNaughton, Kemmerer FO	Eskelson, Josh; Mr. Severns
130	Cumberland Gap Hearth Stone	--	Lee Challinor, owner	Cumberland Gap Hearth Stone
131	Cumberland Gap Hearth Stone (yard)	--	Lee Challinor, owner	Cumberland Gap Hearth Stone
132	Severns Stone (yard)	--	Pete Severns	Severns Stone
133	Wyoming Stone	--	Wyoming Stone LLC, attorney, 2159 S 700 E #240 Salt Lake City; Porter Stone, Martin Porter, Orem, UT, Brian Stephenson, attorney	Porter Stone
134	Bear Lake Community Pit	--	Bill Stout, Pocatello F.O.	--
135	Maad Mountain Common Use area	--	Chuck Horsburgh, Idaho Falls F.O.	Bureau of Land Management
136	Hells Half Acre Commun. Pit	--	Chuck Horsburgh, Idaho Falls F.O.	Bureau of Land Management
137	Lyle Thompson Thornton (yard)	--	Lyle Thompson, owner	Tin Cup Mining Co.
138	Tin Cup Mine	--	Lyle Thompson, owner	Tin Cup Mining Co.
139	Tin Cup Millsite	--	Lyle Thompson, owner	Tin Cup Mining Co.

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IDNo	Name	Operator_Address	Operator_State	Operator_Tele	Location_Descr
120	Drum slate quarry	655 E. Bristlecone Ln Delta UT 84624; Lay Crapo PO Box 1113 Delta UT 84624	UT	435-864-2402	--
121	RMS No. 1 Mtn.Spring Peak	A & R Leasing, Veyo, UT	UT	Kent Smith 435-387-5521 Feller Stone 435-867-8523	--
122	Bright quarry	374 S 500 W PO Box 87 Milford UT 84751	UT	435-387-2770	30 mi W of Cedar on Hwy 21 and 1/2 mi S
123	Red Beryl quarry (aka Ruby Violet)	--	UT	Clint 435-691-1034 cell	S. Wah Wah Mtns.
124	Hiltop	374 S 500 W PO Box 87 Milford UT 84751	UT	435-387-2770	--
125	Rhyolite (aka Color Country Rock)	291 E 1400 S Suite 1 St George UT 84790	UT	435-652-1805	--
126	Star Range Dolomite	--	UT	--	--
127	White Elephant	374 S 500 W PO Box 87 Milford UT 84751	UT	435-387-2770	--
128	Picasso	PO Box 312 Beaver UT 84713	UT	435-438-5522, 801-319-1727 cell	--
129	Oyster Ridge Comm. Pit	--	WY	Eskelson 801-699-5781; Severns: 307-877-9402 off 727-8973 cell	--
130	Cumberland Gap Hearth Stone	414 Opal, Kemmerer, WY 83101	WY	307-877-9513	--
131	Cumberland Gap Hearth Stone (yard)	414 Opal, Kemmerer, WY 83101	WY	307-877-9513	--
132	Severns Stone (yard)	Kemmerer	WY	307-877-9402 off 727-8973 cell	1-2 mi. S. of Kemmerer
133	Wyoming Stone	--	UT	801-485-3707, Stephenson	--
134	Bear Lake Community Pit	--	ID	--	--
135	Maad Mountain Common Use area	--	ID	--	--
136	Hells Half Acre Commun. Pit	--	ID	--	--
137	Lyle Thompson Thornton (yard)	Thornton, ID	ID	208-390-0960, 208-745-8771	W. side Hwy20/26 at Thornton ID
138	Tin Cup Mine	Thornton, ID	ID	208-390-0960, 208-745-8771	--
139	Tin Cup Millsite	Thornton, ID	ID	208-390-0960, 208-745-8771	--

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Location_County	Tp	Rg	Sec&Sub	Lat_dd	Long_dd	UTM_E	UTM_N	UTM_Zone	Coll_Method
120	Drum slate quarry	Juab	14 S	10 W	27 nwse 28 nese	39.5714	-112.9706	330741	4382042	12S	Recorded
121	RMS No. 1 Mtn.Spring Peak	Iron	32 S	16 W	1 swsw, 12 nenw	38.0420	-113.5939	272376	4213652	12S	Copy from SubTerra
122	Bright quarry	Iron	35 S	17 W	21 se, 22 sw, 25, 26, 27 nw, 28 e2	37.7292	-113.7560	257107	4179152	12S	Copy from SubTerra
123	Red Beryl quarry (aka Ruby Violet)	Beaver	29 S	14 W	19 sese	38.2577	-113.4438	286182	4237230	12S	Read from ArcMap
124	Hiltop	Beaver	32 S	16 W	1, 12	38.0428	-113.5909	272639	4213732	12S	Calculated from trs
125	Rhyolite (aka Color Country Rock)	Iron	35 S	17 W	35swse	37.7146	-113.7196	260281	4177631	12S	Calculated from trs
126	Star Range Dolomite	Beaver	28 S	11 W	21 nesw	38.3555	-113.0915	317251	4247328	12S	Read from ArcMap
127	White Elephant	Beaver	29 S	10 W	13 sese	38.2799	-112.9193	332122	4238610	12S	Read from ArcMap
128	Picasso	Beaver	29 S	9 W	17, 20	38.2884	-112.8924	334498	4239508	12S	Calculated from trs
129	Oyster Ridge Comm. Pit	Lincoln	21 N	116 W	25	41.7744	-110.5197	539916	4624846	12T	Recorded
130	Cumberland Gap Hearth Stone	Lincoln	19 N	116 W	20 c	41.6138	-110.5507	537429	4606997	12T	Recorded
131	Cumberland Gap Hearth Stone (yard)	Lincoln	19 N	116 W	20 c	41.5815	-110.5544	537144	4603408	12T	Recorded
132	Severns Stone (yard)	Lincoln	20 N	116 W	6	41.7481	-110.5700	535745	4621908	12T	Recorded
133	Wyoming Stone	Lincoln	21 N	118 W	7, lot ?	41.8130	-110.8650	511206	4629017	12T	Recorded
134	Bear Lake Community Pit	Bear Lake	16 S	45 E	5 w1/2	42.0666	-111.2204	481764	4657194	12T	Recorded
135	Maad Mountain Common Use area	Clark	10 N	33 E	7 se	44.2071	-112.6152	370949	4896141	12T	Recorded
136	Hells Half Acre Commun. Pit	Bingham	1 S	36 E	5,6	43.3593	-112.2732	396833	4801509	12T	Recorded
137	Lyle Thompson Thornton (yard)	Jefferson	5 N	39 E	22	43.7538	-111.8530	431327	4844879	12T	Recorded
138	Tin Cup Mine	Clark	14 N	42 E	8	44.5478	-111.5340	457586	4932863	12T	Recorded
139	Tin Cup Millsite	Clark	14 N	41 E	24	44.5255	-111.5593	455556	4930393	12T	Recorded

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Color	Geology	Generalized_Rock_Unit
120	Drum slate quarry	Maroon	--	--
121	RMS No. 1 Mtn.Spring Peak	Red	--	--
122	Bright quarry	Reddish brown	--	--
123	Red Beryl quarry (aka Ruby Violet)	White	Steamboat Mtns rhyolite (20 mybp)	SteamboatRhyolite
124	Hiltop	White-Orange	--	--
125	Rhyolite (aka Color Country Rock)	Reddish brown	--	--
126	Star Range Dolomite	White	--	--
127	White Elephant	White	--	--
128	Picasso	Light gray	--	--
129	Oyster Ridge Comm. Pit	Light brown	Frontier Fm. Oyster Ridge LS mbr.	Frontier
130	Cumberland Gap Hearth Stone	Light brown	Frontier Fm., 200 ' below Oyster Ridge LS mbr.	Frontier
131	Cumberland Gap Hearth Stone (yard)	--	Frontier Fm	Frontier
132	Severns Stone (yard)	--	--	--
133	Wyoming Stone	Medium brown	Nugget Sandstone	Nugget
134	Bear Lake Community Pit	Orange-White	Nugget Sandstone	Nugget
135	Maad Mountain Common Use area	Gray	Rhyolite Tuff	Rhyolite
136	Hells Half Acre Commun. Pit	Black	Recent basalt flow	Basalt
137	Lyle Thompson Thornton (yard)	--	--	--
138	Tin Cup Mine	Light gray	Quartzite (pC) of Tin Cup Mtn.	Qtzte_PC
139	Tin Cup Millsite	--	--	--

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Lithologic_Description	Generalized_Lithology
120	Drum slate quarry	Quartzite, argillaceous, maroon in color, 5 ft thick unit in face breaks into 3/4" slabs	Quartzite
121	RMS No. 1 Mtn.Spring Peak	Tuff, red, rhyolitic, tuffaceous, conglomeratic and porcellaneous	Rhyolite
122	Bright quarry	Rhyolite, flow banded, hematized, silicified, bleached, variety of colors	Rhyolite
123	Red Beryl quarry (aka Ruby Violet)	Rhyolite, white, crystalline	Rhyolite
124	Hiltop	Quartzite, concentric light-med., orange liesegang banding and fractuing prominent, hard, flaggy	Quartzite
125	Rhyolite (aka Color Country Rock)	Rhyolite, varicolored, hard	Rhyolite
126	Star Range Dolomite	Dolomite, white to light gray, granular, hard	Dolomite
127	White Elephant	Dolomite, white, granular	Dolomite
128	Picasso	Marblized and silicified material, in chunks, occur as dilational layers in limestone unit	Marble
129	Oyster Ridge Comm. Pit	Sandstone, med hard, flaggy, breaks into 1/2"-2" thicknesses; 1-1/2"-3" flagstone, splits readily; pick up from surface; hard and durable sandstone	Sandstone
130	Cumberland Gap Hearth Stone	Sandstone, light brown to med. Brown	Sandstone
131	Cumberland Gap Hearth Stone (yard)	Sandstone, light brown to med. Brown	Sandstone
132	Severns Stone (yard)	--	--
133	Wyoming Stone	Sandstone, hard, flaggy, buff color, from talus, at least 4 areas of talus	Sandstone
134	Bear Lake Community Pit	Sandstone, orange and white, hard, mostly large blocks and few to no flagstone	Sandstone
135	Maad Mountain Common Use area	Rhyolite, med gray in color, plate-like weathering character favors breaking into platy shapes of 1"-3" thickness	Rhyolite
136	Hells Half Acre Commun. Pit	Basalt blocks, random size and shape; Abundant	Basalt
137	Lyle Thompson Thornton (yard)	--	--
138	Tin Cup Mine	Quartzite, undulatory bedding, v hard, brittle, breaks in shards, micaceous, light gray, vitreous	Quartzite
139	Tin Cup Millsite	--	--

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Other_characteristics	Extraction_Fractures_Cleavability	Product_Dimension_Fractures_Cleavability
120	Drum slate quarry		Favorable with respect to extraction	Unfavorable with respect to product dimensions
121	RMS No. 1 Mtn.Spring Peak	Material selected for aquarium rock is porcellaneous variety, due to greater hardness	Not Applicable.	Favorable with respect to product dimensions.
122	Bright quarry	Hardness and variety of coloration are most prominent	Not Applicable.	Unfavorable with respect to product dimensions
123	Red Beryl quarry (aka Ruby Violet)	Rhyolite contains crystals (2 mm-10 mm) of red beryl	--	--
124	Hiltop	--	Unfavorable with respect to extraction	Unfavorable with respect to product dimensions
125	Rhyolite (aka Color Country Rock)	Breaks in large blocks	Not Applicable.	Not applicable
126	Star Range Dolomite	--	Not Applicable.	Not applicable
127	White Elephant	--	Not Applicable.	Not applicable
128	Picasso	Rock chunks are selected for sculpting; hard due to silicification; contains delicate internal pattern	Not Applicable.	Not applicable
129	Oyster Ridge Comm. Pit	Sandstone forms good flagstone slabs; moderately durable; can be collected over large area without need of equipment	Favorable with respect to extraction	Favorable with respect to product dimensions.
130	Cumberland Gap Hearth Stone	Large blocks 2", 3", 12", 16" thick; capable of large dimension; hard, durable, suitable to split in cris-cutter;	Favorable with respect to extraction	Favorable with respect to product dimensions.
131	Cumberland Gap Hearth Stone (yard)	--	--	--
132	Severns Stone (yard)	--	--	--
133	Wyoming Stone	Pick up from talus pile (ie low labor cost); 2"-3" thickness flagstone	Favorable with respect to extraction	Favorable with respect to product dimensions.
134	Bear Lake Community Pit	Large blocks, up to several feet; orange and white color	Unfavorable with respect to extraction	Unfavorable with respect to product dimensions
135	Maad Mountain Common Use area	Platy shape gives ease of selection and palletizing; lichen covering; gray color	Not Applicable.	Favorable with respect to product dimensions.
136	Hells Half Acre Commun. Pit	Angular blocks of basalt most common; small (<2" blocks) are very rare	Unfavorable with respect to extraction	Unfavorable with respect to product dimensions
137	Lyle Thompson Thornton (yard)	--	--	--
138	Tin Cup Mine	Hardness, brittleness, undulatory bedding (according to owner); splits to flagstone size blocks; bright lustre due to mica; quartzite splits along parallel planes; appears to sell at premium price compared to low operating costs	Unfavorable with respect to extraction	Favorable with respect to product dimensions.
139	Tin Cup Millsite	--	--	--

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Influence_of_Texture	Uniform_Thickness	Lithology_Hardness_Durability	Rock_Quality_Suitability
120	Drum slate quarry	No Influence	No	Moderately Advantageous	Limited amount of flagstone material is available
121	RMS No. 1 Mtn.Spring Peak	Likely influence	No	Advantageous	Only a small thickness of material in vertical seam is available; its occurrence is not predictable
122	Bright quarry	No Influence	No	Advantageous	Excellent, very hard & durable. Light to dark purple.
123	Red Beryl quarry (aka Ruby Violet)	--	--	--	--
124	Hiltop	No Influence	No	Moderately Advantageous	Very durable quartzite flagstone w/ iron/manganese oxide staining and cencentric banding. Banding tends to fade on exposure to elements.
125	Rhyolite (aka Color Country Rock)	No Influence	No	Moderately Advantageous	Very hard, durable, hematized & silicified rhyolite, color purplish-red.
126	Star Range Dolomite	No Influence	No	Advantageous	Bright white marble suitable for crushing into decorative groundcover. Inclusions of serpentine and bluish chert nodules advantage / disadvantage depending on purchaser preference.
127	White Elephant	Likely influence	No	Moderately Advantageous	Fair to good quality
128	Picasso	Likely influence	No	Advantageous	Excellent, very fine-grained/high surface hardness
129	Oyster Ridge Comm. Pit	Likely influence	Yes	Moderately Advantageous	Community pit limits the area for selecting material
130	Cumberland Gap Hearth Stone	Likely influence	Yes	Moderately Advantageous	Good quality flagstone
131	Cumberland Gap Hearth Stone (yard)	--	--	--	--
132	Severns Stone (yard)	--	--	--	--
133	Wyoming Stone	No Influence	Yes	Moderately Advantageous	Extraction only from talus piles severely limits resource
134	Bear Lake Community Pit	No Influence	No	Disadvantageous	Poor quality
135	Maad Mountain Common Use area	Likely influence	Yes	Moderately Advantageous	Scattered on talus slopes over large area
136	Hells Half Acre Commun. Pit	No Influence	No	Moderately Advantageous	Finding suitable material is limiting factor
137	Lyle Thompson Thornton (yard)	--	--	--	--
138	Tin Cup Mine	No Influence	No	Moderately Advantageous	Rock is moderate to poor quality due to large amount of randomly sized blocks
139	Tin Cup Millsite	--	--	--	--

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Size	Ease_of_Extraction	Extent_of_Deposit	Reserve_Limits_Overburden
120	Drum slate quarry	Small	Difficult (blasting required under confined or otherwise difficult conditions).	Limited or Confined	Few hundred tons; 20 ft overburden but increases with distance from outcrop
121	RMS No. 1 Mtn.Spring Peak	Small	Moderately difficult	Limited or Confined	Undefined, but large reserve
122	Bright quarry	Large-Material site	Moderately difficult (blasting likely required, or extraction otherwise made difficult through extensive overburden, unfavorable structure, etc.)	Extended	Several hundred thousand tons.
123	Red Beryl quarry (aka Ruby Violet)	Large	--	--	--
124	Hiltop	Small	Moderately difficult	Limited or Confined	Undefined, but large reserve
125	Rhyolite (aka Color Country Rock)	Small	Difficult (blasting required under confined or otherwise difficult conditions).	Limited or Confined	Undefined, but large reserve
126	Star Range Dolomite	Small	Difficult (blasting required under confined or otherwise difficult conditions).	Limited or Confined	Several thousand tons in mine area, large adjacent undeveloped reserves.
127	White Elephant	Small	Moderately difficult	Limited or Confined	Few hundred to thousand tons possible near surface
128	Picasso	Large	Difficult (blasting required under confined or otherwise difficult conditions).	Limited or Confined	Undefined, but large reserve
129	Oyster Ridge Comm. Pit	Small-Material site	Very easy (no mechanized equipment required, although it might be used)	Extended	Not applicable
130	Cumberland Gap Hearth Stone	Large	Moderately easy	Extended	Little overburden, 3 ft
131	Cumberland Gap Hearth Stone (yard)	Yard-operations	--	--	--
132	Severns Stone (yard)	Yard-wholesale	--	--	--
133	Wyoming Stone	Medium-Material site	Very easy (no mechanized equipment required, although it might be used)	Limited or Confined	Not applicable
134	Bear Lake Community Pit	Small-Material site	Moderately difficult (blasting required under confined conditions)	Limited or Confined	Unknown reserve
135	Maad Mountain Common Use area	Medium-Material site	Very easy (no mechanized equipment required, although it might be used)	Extended	No overburden; collected from surface
136	Hells Half Acre Commun. Pit	Small-Material site	Extraction easy, only after finding suitable material	Extended	Reserve large, but unknown
137	Lyle Thompson Thornton (yard)	Yard-wholesale	--	--	--
138	Tin Cup Mine	Medium	Moderately difficult	Extended	Overburden of 5 ft hampers extraction by use of hydraulic excavator
139	Tin Cup Millsite	Yard-operations	--	--	--

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Number_Products	Known_Products	Acres	Mining_Method	Hand_Methods
120	Drum slate quarry	Small (1 - 2 products)	Flagstone, 3/4" to 4 " thick	1	Hand-mechanized combined	Hand split, sort
121	RMS No. 1 Mtn.Spring Peak	Small (1 - 2 products)	Aquarium stone (opalized, porcellaneous variety)	0.5	Hand-mechanized combined	Hand split, sort
122	Bright quarry	Large (>5 products)	Crushed rock products	18	Mechanized	None
123	Red Beryl quarry (aka Ruby Violet)	--	--	--	Hand-mechanized combined	Hand split, sort
124	Hiltop	Small (1 - 2 products)	Random pieces	0.2	Hand-mechanized combined	Hand split, sort
125	Rhyolite (aka Color Country Rock)	Small (1 - 2 products)	Rhyolite for decorative boulders or aggregate	0.5	Mechanized	None
126	Star Range Dolomite	Small (1 - 2 products)	Crushed groundcover, landscape boulders	1	Mechanized	None
127	White Elephant	Small (1 - 2 products)	Crushed groundcover, landscape boulders	0.5	Mechanized	None
128	Picasso	Small (1 - 2 products)	Sculpting blocks 10 lbs up to multi-ton	4.7	Hand-mechanized combined	Hand split, sort
129	Oyster Ridge Comm. Pit	Small (1 - 2 products)	Flaggy sandstone	160	Hand only	Surface collection
130	Cumberland Gap Hearth Stone	Medium (3-5 products)	Flaggy sandstone; 1"-2" flagstone, most are cut to size, part rounded in tumbler; 6"-14" blocks by any length and width	20	Hand-mechanized combined	Hand split, sort
131	Cumberland Gap Hearth Stone (yard)	--	--	--	--	--
132	Severns Stone (yard)	--	--	--	--	--
133	Wyoming Stone	Small (1 - 2 products)	Flagstone from talus	--	Hand only	Surface collection
134	Bear Lake Community Pit	Small (1 - 2 products)	Large blocks	--	Hand-mechanized combined	Hand split, sort
135	Maad Mountain Common Use area	Small (1 - 2 products)	Flagstone; random slabs	--	Hand only	Surface collection
136	Hells Half Acre Commun. Pit	Small (1 - 2 products)	Random blocks	--	Unknown	Unknown
137	Lyle Thompson Thornton (yard)	--	--	--	--	--
138	Tin Cup Mine	Small (1 - 2 products)	Large blocks of qtzte.; quartzite boulders; 1" thick small flagstone; 2-3" thick flagstone	2	Hand-mechanized combined	Hand split, sort
139	Tin Cup Millsite	--	--	--	--	--

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Mining_Description	Production_rate
120	Drum slate quarry	Blasting, then dig with hyd excavator	--
121	RMS No. 1 Mtn.Spring Peak	Blasting, then dig with hyd excavator	--
122	Bright quarry	Drill blast, dig with hydraulic excavator	--
123	Red Beryl quarry (aka Ruby Violet)	Drill blast, dig with hydraulic excavator, push material with dozer to remove overburden; extract beryl crystals by visual examination by hand method'	18g/ton; 5 carats/g; or max. 5x18 carats/tons; and $400-1000/carat
124	Hiltop	Dig with hyd excavator	100 tons in total
125	Rhyolite (aka Color Country Rock)	Drill, blast, remove and load truck using hyd excavator	--
126	Star Range Dolomite	Drill, blast, remove and load truck using hyd excavator	--
127	White Elephant	Drill, blast, remove and load truck using hyd excavator	--
128	Picasso	Dig with hyd excavator	--
129	Oyster Ridge Comm. Pit	Surface collection only	--
130	Cumberland Gap Hearth Stone	Remove OB with dozer and expose proper strata; hyd excavator to dislodge and load material onto trucks; transport 8 mi to processing yard	6000 tpy
131	Cumberland Gap Hearth Stone (yard)	--	--
132	Severns Stone (yard)	--	--
133	Wyoming Stone	Remove from talus by hand, sort and palletize; surface collection only	32 tons removed under casual use; 120 t/mo planned during summer months
134	Bear Lake Community Pit	Drill, blast, dig with hyd excavator	Unknown
135	Maad Mountain Common Use area	Surface collection only	--
136	Hells Half Acre Commun. Pit	Surface collection only	--
137	Lyle Thompson Thornton (yard)	--	--
138	Tin Cup Mine	Loosen with dozer, dig and load with hyd excavator; haul to millsite 2.5 mi to S.	250 pallets in 2004; 800 tons in 2003; 1250 tons in 2002
139	Tin Cup Millsite	--	--

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Processing_onsite	Work_schedule	Personnel	Buildings
120	Drum slate quarry	Haul to splitting area 1 mi downhill		None on site	--
121	RMS No. 1 Mtn.Spring Peak	Marketable material represents about 1/1,000-th of material moved	Intermittent	2 laborers when operating	--
122	Bright quarry	Crush, screen	Full	1 truck driver/equip operator; 2 crusher operators	--
123	Red Beryl quarry (aka Ruby Violet)	--	May-Sept. (longer if weather permits)	2 owners; 4-5 laborers, operators; 1 geologist (Clint) and 1 assistant	--
124	Hiltop	Hand sort	Intermittent	Unknown	--
125	Rhyolite (aka Color Country Rock)	--	--	--	--
126	Star Range Dolomite	--	--	--	--
127	White Elephant	--	--	--	--
128	Picasso	Hand select and palletize	Intermittent	1 owner; 1 helper	--
129	Oyster Ridge Comm. Pit	--	--	--	--
130	Cumberland Gap Hearth Stone	Cut to size with cris-cutter; some are processed in tumbler		30 laborers, 1 operator	--
131	Cumberland Gap Hearth Stone (yard)	--	--	--	--
132	Severns Stone (yard)	--	--	--	--
133	Wyoming Stone	Sort and palletize		4 laborers	--
134	Bear Lake Community Pit	--	--	None	--
135	Maad Mountain Common Use area	--	--	None at time of visit	--
136	Hells Half Acre Commun. Pit	--	--	--	--
137	Lyle Thompson Thornton (yard)	--	--	None at time of visit	--
138	Tin Cup Mine	--	7 d/wk, 16 wk/yr	2 laborers, 1 owner-operator in 2004; owners says unable to get laborers	--
139	Tin Cup Millsite	--	--	--	--

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Equipment	Product_inventory
120	Drum slate quarry	Haul truck, excavator, track drill; but not on site	--
121	RMS No. 1 Mtn.Spring Peak	1 hyd excavator; 1 flatbed trailer, 1 kva generator; 1 hammer breaker (listed in notice)	--
122	Bright quarry	1 truck 25 ton CAT; 1 CAT excavator; 1 truck rock body 22-t; 1 wheel loader Kawasaki 902-III; 2 trailer vans for parts; 1 multicrane; 1 fuel trailer; 1 18kva generator; 1 lube truck; 1 pickup; 2 portable screens; 8 converyors 14-24"; 1 crusher; 2 CAT diesel motors; 3 shaker screens	Several piles of materials, mostly crushed product, called: red, peaches and cream; brown; lilac; purple; tan; Sizes: 1", 3-6"; 1-3", -1"+sand; +1/8-3/4"; landscape boulders
123	Red Beryl quarry (aka Ruby Violet)	2 hyd excavators, 235 L; 2 16G Cat grader; 1 wheel loader 970; 2 dozers D-6, D-8; 1 track drill atlas 246; 1 track excavator Lavamer 315; 5 pickups; 1 water truck; 1 trailer; 1 fuel/mechanics truck (PU)	--
124	Hiltop	1 backhoe, 1 pickup, 1 drill	--
125	Rhyolite (aka Color Country Rock)	1 hyd excavator; 1 haul truck	--
126	Star Range Dolomite	--	--
127	White Elephant	--	--
128	Picasso	1 hyd excavator Cat 3345 B $ 8250/mo rental; 1 dozer D-6; 1, truck for hand palletizing; 1 tracked loader; 1 flat bed trailer; 1 semi truck dump bed 20-ton (photos in case file)	--
129	Oyster Ridge Comm. Pit	No mechanized equipment allowed	--
130	Cumberland Gap Hearth Stone	1, 135 Komatsu Dozer; 1, Komatsu tr excavator; 1 Hehl DL 12-H forklift; 1 cris-cutter (small, $30,000); 1 tumbler	300 pallets at mine site
131	Cumberland Gap Hearth Stone (yard)	--	450 pallets at yard
132	Severns Stone (yard)	--	~150 pallets; many blocks of various sizes and types
133	Wyoming Stone	1 pickup; 1 bobcat wheel loader; 1 trailer; 1 transport truck (photo) 6-ton	24 pallets
134	Bear Lake Community Pit	None	None
135	Maad Mountain Common Use area	Unknown	--
136	Hells Half Acre Commun. Pit	--	--
137	Lyle Thompson Thornton (yard)	--	175 pallets
138	Tin Cup Mine	2 haul trucks, 12-ton; 1 track loader IH-125C; 1 tracked excavator; 1 dozer, Komatsu ~D-8 equiv; 1 Bobcat forklift ($7500 used)	150 pallets of 1", 2-3" and small and large block; expects another 100 pallets by end of season
139	Tin Cup Millsite	--	150 pallets of 1", 2-3" and small and large block; expects another 100 pallets by end of season

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Sales_price	Market_description	Destination
120	Drum slate quarry	--	--	--
121	RMS No. 1 Mtn.Spring Peak	$1/lb	--	--
122	Bright quarry	5-yr sales contract for 20,000 tons @ $0.80/ton	Cedar Landscape, Cedar City (10%; St George, Mesquite, and LasVegas (90%)	--
123	Red Beryl quarry (aka Ruby Violet)	--	--	--
124	Hiltop	--	--	--
125	Rhyolite (aka Color Country Rock)	Contract terms: 50,000 cu yrds/yr @ $0.80/cu yd	--	--
126	Star Range Dolomite	Contract terms: 2500 cu yrds/yr @ $0.80/cu yd	--	--
127	White Elephant		--	--
128	Picasso	$0.35/lb wholesale for 5-200 lb blocks; $1.00/lb for select pieces; resells for $2.40/lb; total production $500,000	Sculpting customers	Local and China
129	Oyster Ridge Comm. Pit	Contract terms: $10/ton	Local area	--
130	Cumberland Gap Hearth Stone	235/ton	Jackson WY ($10/t transport); Salt Lake; Delta, UT Denver, CO California; Sun Valley ID	--
131	Cumberland Gap Hearth Stone (yard)	--	--	--
132	Severns Stone (yard)	--	--	--
133	Wyoming Stone	$180/ton	--	--
134	Bear Lake Community Pit	--	--	--
135	Maad Mountain Common Use area	--	--	--
136	Hells Half Acre Commun. Pit	--	--	--
137	Lyle Thompson Thornton (yard)	--	--	--
138	Tin Cup Mine	--	--	--
139	Tin Cup Millsite	--	--	--

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IDNo	Name	Prod_1995	Prod_1996	Prod_1997	Prod_1998	Prod_1999	Prod_2000	Prod_2001	Prod_2002	Prod_2003	Prod_2004	Max_prod
120	Drum slate quarry							97	533	60	30	533
121	RMS No. 1 Mtn.Spring Peak		25	75	50	NR	NR	NR	0	NR	NR	50
122	Bright quarry									4000	18500	18500
123	Red Beryl quarry (aka Ruby Violet)					10212	8160		0	NR	NR	10212
124	Hiltop	0	0	0	0	0	0	0	0	0	0	
125	Rhyolite (aka Color Country Rock)							800	500	100	50	800
126	Star Range Dolomite											
127	White Elephant		NR	NR	NR	NR	NR	NR	NR	NR	0	
128	Picasso							0	30	40	20	40
129	Oyster Ridge Comm. Pit											
130	Cumberland Gap Hearth Stone										4833	4833
131	Cumberland Gap Hearth Stone (yard)											
132	Severns Stone (yard)											
133	Wyoming Stone										720	720
134	Bear Lake Community Pit											
135	Maad Mountain Common Use area											
136	Hells Half Acre Commun. Pit											
137	Lyle Thompson Thornton (yard)											
138	Tin Cup Mine								1250	800	475	1250
139	Tin Cup Millsite											

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Comments
120	Drum slate quarry	--
121	RMS No. 1 Mtn.Spring Peak	Reclamation is pending
122	Bright quarry	Opened in 2001 In cu yds
123	Red Beryl quarry (aka Ruby Violet)	Gem beryl production, 2001, 124,058 gr
124	Hiltop	50 tons removed Jan-March 2005 (Ed Ginouves, BLM)
125	Rhyolite (aka Color Country Rock)	Drilled and blasted 8900 cu yds in 75' x 100' area with 4" diam holes by 3 Rivers for $1/ton; materials used: 3000 lbs of anfo + primers
126	Star Range Dolomite	--
127	White Elephant	Minor sampling occurred in 2004
128	Picasso	--
129	Oyster Ridge Comm. Pit	--
130	Cumberland Gap Hearth Stone	--
131	Cumberland Gap Hearth Stone (yard)	--
132	Severns Stone (yard)	--
133	Wyoming Stone	Registered corporation agent: Joseph Bleumel, 510 Sapphire St PO Box 47 Kemmerer WY 83101; previous sales in area are $10/ton see production col.
134	Bear Lake Community Pit	Lat-long, other pits: (2)42.0641, 111.22029; (3)42.0607, 111.2215
135	Maad Mountain Common Use area	--
136	Hells Half Acre Commun. Pit	--
137	Lyle Thompson Thornton (yard)	--
138	Tin Cup Mine	Location of other pits: (2)44.5481, 111.5345; (3) 44.5498, 111.532 see production col.
139	Tin Cup Millsite	--

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IDNo	Name	Alt_Name	Location_State	Surface_Mgmt	Case_Type	Visited	Photos	Sampled	Date_Visit	Status
140	Cream Time (DOGM's Mayfield)	Mayfield	UT	State of Utah lease/Private	State of Utah lease	Yes	Yes	Yes	June 1 2004	Active
141	Day quarry (DOGM's Temple Strike)	Temple Strike	UT	State of Utah lease	State of Utah lease	Yes	Yes	Yes	June 1 2004	Active
142	Nielsen quarry	--	UT	Richfield FO	Material site	Yes	Yes	Yes	June 1 2004	Past producer
143	KSC #1 - Kanosh Stone Co.	--	UT	Richfield FO	Claims	Yes	Yes	Yes	June 1 2004	Past producer
144	KSC #2 - Kanosh Stone Co. (DOGM's UTU 79911)	UTU 79911	UT	Richfield FO	Material sale-contract pending	Yes	Yes	Yes	June 1 2004	Explored
145	DSP Stone (Diversified Stone Products?)	Diversified Stone Products	UT	Richfield FO	Claims	Yes	Yes	Yes	June 1 2004	Past producer
146	Capitol Reef Community Pit	--	UT	Hanksville FS	Community Pit	Yes	Yes	Yes	June 2 2004	Active
147	Quality Stone Material Site	--	UT	Hanksville FS	Material site	Yes	Yes	Yes	June 2 2004	Active
148	American Stone quarry (DOGM's Torrey)	--	UT	Hanksville FS	Claims	Yes	Yes	Yes	June 2 2004	Active
149	Sandstone Mountain	--	UT	St George FO	Claims	Yes	Yes	Yes	June 17 2004	Explored
150	Fire Pit #1-4	--	UT	St George FO	Claims	Yes	Yes	Yes	June 17 2004	Explored
151	Snow White	--	UT	St George FO	Claims	Yes	Yes	Yes	June 16 2004	Past producer
152	Dolomite Stone #1	--	UT	St George FO	Material site	Yes	Yes	Yes	June 16 2004	Inactive
153	Leisegang #9 (Butcher Knife)	Butcher Knife	UT	St George FO	Material site	Yes	Yes	Yes	June 16 2004	Inactive
154	Black Ridge #1	--	UT	St George FO	Claims	Yes	Yes	Yes	June 15 2004	Past producer
155	Limestone Mesa (Desert Bronze) material site	Desert Bronze	UT	St George FO	Material site	Yes	Yes	Yes	June 15 2004	Active
156	Virgin Community Pit	--	UT	St George FO	Community Pit	Yes	Yes	Yes	June 15 2004	Active

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IDNo	Name	Map_Name	Type_Site	Claim_Name	BLM_Case	SubTerra_Number	UT_DOGM_ID
140	Cream Time (DOGM's Mayfield)	Manti 100k	Quarry	--	--	s390011	s390011
141	Day quarry (DOGM's Temple Strike)	Manti 100k	Quarry	--	--	s390015	s390015
142	Nielsen quarry	Richfield 100K	Quarry	Unknown claim name	UTU (a 3809 Notice)	m230012	m230012
143	KSC #1 - Kanosh Stone Co.	Richfield 100K	Quarry-reclaimed		UTU 071640	s410027	S410027
144	KSC #2 - Kanosh Stone Co. (DOGM's UTU 79911)	Richfield 100K	Quarry	Unknown claim name	UTU 079911	--	s410035
145	DSP Stone (Diversified Stone Products?)	Richfield 100K	Quarry	--	UTU 79911	--	s410035
146	Capitol Reef Community Pit	Loa 100K	Surface collection only	--	--	--	--
147	Quality Stone Material Site	Loa 100K	Quarry	--	--	--	--
148	American Stone quarry (DOGM's Torrey)	Loa 100K	Quarry	2 assoc. placer	UTU 070593	s550016	m550016
149	Sandstone Mountain	St George 100k	Quarry, proposed	--	UTU 074041	UTU 074041	s0530035
150	Fire Pit #1-4	St George 100k	Quarry, proposed	--	UTU 066868	s530034	s530034
151	Snow White	St George 100k	Quarry	Lode	UTU 078598	s530065	s530065
152	Dolomite Stone #1	St George 100k	Quarry	--	UTU 074914	s530050	S0530050
153	Leisegang #9 (Butcher Knife)	St George 100k	Quarry	--	UTU 078933	s530068	s530068
154	Black Ridge #1	St George 100k	Quarry	--	UTU 068868	s530027	S0530027
155	Limestone Mesa (Desert Bronze) material site	St George 100k	Quarry	--	UTU 080284	s530059	S0530059
156	Virgin Community Pit	St George 100k	Quarry	--	UTU 080541	s530072	

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	UT_SITLA_ID	Data_Source	Operator_Name
140	Cream Time (DOGM's Mayfield)	ML 47722 MP	Danny Bown, Phyllis Bown; SubTerra (2004); UT DOGM; John Blake Utah SITLA	Bown, Danny and Phyllis Bown
141	Day quarry (DOGM's Temple Strike)	47844	Michael Jackson Richfield FO; SubTerra (2004); UT DOGM; John Blake Utah SITLA	Day, William
142	Nielsen quarry	--	Michael Jackson Richfield FO	Morrill Nielsen
143	KSC #1 - Kanosh Stone Co.	--	Michael Jackson Richfield FO; SubTerra (2004); UT DOGM	Kanosh Stone, Steve Sorenson
144	KSC #2 - Kanosh Stone Co. (DOGM's UTU 79911)	--	Michael Jackson Richfield FO; UT DOGM	Kanosh Stone, Steve Sorenson
145	DSP Stone (Diversified Stone Products?)	--	Michael Jackson Richfield FO; UT DOGM	Aguiar, Tony
146	Capitol Reef Community Pit	--	Francis Rakow, Hanksville FO	Bureau of Land Management
147	Quality Stone Material Site	--	Francis Rakow, Hanksville FO	Quality Building Stone, Weston Hansen
148	American Stone quarry (DOGM's Torrey)	--	Francis Rakow, Hanksville FO; SubTerra (2004); UT DOGM	American Stone, Lon Thomas
149	Sandstone Mountain	--	Rick Rymerson St George FO; SubTerra (2004)	Northern Stone Supply Co.
150	Fire Pit #1-4	--	Rick Rymerson St George FO; SubTerra (2004); UT DOGM	Western Hills, Ken Brown
151	Snow White	--	Rick Rymerson St George FO; SubTerra (2004); UT DOGM	Color Country Rock Preston (Lonny) Hafen
152	Dolomite Stone #1	--	Rick Rymerson St George FO; SubTerra (2004); UT DOGM	Laub, Steven and Ramona Jebson (daughter)
153	Leisegang #9 (Butcher Knife)	--	Rick Rymerson St George FO; UT DOGM	Color Country Rock Preston (Lonny) Hafen
154	Black Ridge #1	--	Rick Rymerson St George FO; SubTerra (2004); UT DOGM	Thirsty Stone Resources www.thirstystone.com, John Halton
155	Limestone Mesa (Desert Bronze) material site	--	Rick Rymerson St George FO; SubTerra (2004); UT DOGM	Southwest Stone, LLC Jeff Sagers
156	Virgin Community Pit	--	Rick Rymerson St George FO; SubTerra (2004)	Bureau of Land Management

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Operator_Address	Operator_State	Operator_Tele	Location_Descr
140	Cream Time (DOGM's Mayfield)	595 E 600 S PO Box 27 Manti, UT 84642	UT	435-835-7542	--
141	Day quarry (DOGM's Temple Strike)	521 E 1910 S Orem, UT 84058	UT	801-225-4440	--
142	Nielsen quarry	Sevier	UT	--	--
143	KSC #1 - Kanosh Stone Co.	Kanosh, UT 84637	UT	435-759-2639	--
144	KSC #2 - Kanosh Stone Co. (DOGM's UTU 79911)	Kanosh	UT	--	--
145	DSP Stone (Diversified Stone Products?)	Fillmore	UT	--	--
146	Capitol Reef Community Pit	--	UT	--	--
147	Quality Stone Material Site	Sandy UT	UT	--	--
148	American Stone quarry (DOGM's Torrey)	Salt Lake City UT	UT	801-262-4300 Roger	--
149	Sandstone Mountain	PO Box 249 Oakley ID	UT	208-862-3353	--
150	Fire Pit #1-4	288 W. Center Kanab UT 84741	UT	435-644-2390	--
151	Snow White	291 E 1400 S Suite 1 St George UT 84790	UT	435-652-1805	--
152	Dolomite Stone #1	PO Box 400 Santa Clara, UT 84765	UT	435-673-9308 cellular	--
153	Leisegang #9 (Butcher Knife)	291 E 1400 S Suite 1 St George UT 84790	UT	435-652-1805	--
154	Black Ridge #1	860 E. 19th St Tucson AZ 85719	AZ	520.623.1396	--
155	Limestone Mesa (Desert Bronze) material site	2421 W 350 N Hurricane, UT 84737	UT	435.635.2601	--
156	Virgin Community Pit	St. George	UT	--	1/2-mile east of Limestone Mesa mat. Site

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IDNo	Name	Location_County	Tp	Rg	Sec&Sub	Lat_dd	Long_dd	UTM_E	UTM_N	UTM_Zone	Coll_Method
140	Cream Time (DOGM's Mayfield)	Sanpete	20 S	2 E	17 swsw	39.0610	-111.7111	438478	4323790	12S	Copy from SubTerra
141	Day quarry (DOGM's Temple Strike)	Sanpete	19 S	2 E	21	39.1426	-111.6973	439737	4332832	12S	Copy from SubTerra
142	Nielsen quarry	Sevier	25 S	3 E	31 ne	38.5853	-112.1654	398500	4271400	12S	Read from map
143	KSC #1 - Kanosh Stone Co.	Sevier	26 S	4 W	23 sw	38.5155	-112.2044	395000	4263700	12S	Read from map
144	KSC #2 - Kanosh Stone Co. (DOGM's UTU 79911)	Sevier	26 S	4 W	24 ce1/2	38.5202	-112.1827	396900	4264200	12S	Read from map
145	DSP Stone (Diversified Stone Products?)	Sevier	26 S	4 W	24 swsenw	38.5183	-112.1930	396000	4264000	12S	read from map
146	Capitol Reef Community Pit	Wayne	29 S	5 E	17 sesese	38.2760	-111.3681	467800	4236500	12S	Read from map
147	Quality Stone Material Site	Wayne	29 S	5 E	24	38.2866	-111.4288	462500	4237700	12S	Read from map
148	American Stone quarry (DOGM's Torrey)	Wayne	29 S	5 E	17 senw, 8 se	38.2894	-111.3888	466000	4238000	12S	Read from map
149	Sandstone Mountain	Washington	41 S	13 W	15 sw	37.2208	-113.3085	295179	4121863	12S	Recorded
150	Fire Pit #1-4	Washington	41 S	13 W	15 nwsw, nwsw	37.2229	-113.3065	295362	4122092	12S	Recorded
151	Snow White	Washington	39 S	19 W	9 swse	37.4052	-113.9773	236472	4143985	12S	Recorded
152	Dolomite Stone #1	Washington	39 S	19 W	10 nwnw	37.4164	-113.9664	237476	4145197	12S	Recorded
153	Leisegang #9 (Butcher Knife)	Washington	39 S	19 W	15 nwse	37.3952	-113.9582	238128	4142822	12S	Recorded
154	Black Ridge #1	Washington	42 S	14 W	18 lots 7-12 nesw	37.1290	-113.4701	280574	4112034	12S	Copy from SubTerra
155	Limestone Mesa (Desert Bronze) material site	Washington	41 S	12 W	29 w2se	37.1910	-113.2269	302342	4118383	12S	Recorded
156	Virgin Community Pit	Washington	41 S	12 W	29	37.1865	-113.2273	302295	4117885	12S	Recorded

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IDNo	Name	Color	Geology	Generalized_Rock_Unit
140	Cream Time (DOGM's Mayfield)	Light brown	Green River Formation (Eocene)	GreenRiver
141	Day quarry (DOGM's Temple Strike)	Light brown	Green River Formation (Eocene)	GreenRiver
142	Nielsen quarry	Medium gray	Joe Lott Tuff member of Mt. Belknap Volcanics (Mio.)	JoeLottTuff
143	KSC #1 - Kanosh Stone Co.	Grayish pink	Bullion Canyon Volcanics (Oligocene)	BullionCanVolc
144	KSC #2 - Kanosh Stone Co. (DOGM's UTU 79911)	Grayish pink	Bullion Canyon Volcanics (Oligocene)	BullionCanVolc
145	DSP Stone (Diversified Stone Products?)	Sandstone	Bullion Canyon Volcanics (Oligocene)	BullionCanVolc
146	Capitol Reef Community Pit	Light brown	Moenkopi Formation	Moenkopi
147	Quality Stone Material Site	Reddish brown	Moenkopi Formation	Moenkopi
148	American Stone quarry (DOGM's Torrey)	Reddish brown	Moenkopi Formation	Moenkopi
149	Sandstone Mountain	Light reddish brown	Navajo Sandstone	Navajo
150	Fire Pit #1-4	Reddish brown	Navajo Sandstone	Navajo
151	Snow White	White	Callville Limestone (Paleozoic)	Callville
152	Dolomite Stone #1	White	Callville Limestone (Paleozoic)	Callville
153	Leisegang #9 (Butcher Knife)	Light brown	Callville Limestone (Paleozoic)	Callville
154	Black Ridge #1	--	Shinarump Congl. Mbr of Chinle Form.	ShinarumpMbr
155	Limestone Mesa (Desert Bronze) material site	Pinkish brown	Virgin Limestone member of Moenkopi Formation	Moenkopi
156	Virgin Community Pit	Pinkish brown	Virgin Limestone member of Moenkopi Formation	Moenkopi

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IDNo	Name	Lithologic_Description	Generalized_Lithology
140	Cream Time (DOGM's Mayfield)	Sandstone, limey, 2-3" thick	Sandstone
141	Day quarry (DOGM's Temple Strike)	Limestone, sandy, finely laminated, with concretions, breaks into 2"-6" thick blocks	Limestone
142	Nielsen quarry	Lithic tuff with aphanitic groundmass	Volcanic
143	KSC #1 - Kanosh Stone Co.	Rhyolitic tuff; color banding noted	Rhyolite
144	KSC #2 - Kanosh Stone Co. (DOGM's UTU 79911)	Sandstone, tuffaceous, rhyolitic, volcaniclastic	Sandstone
145	DSP Stone (Diversified Stone Products?)	Color banding important	Sandstone, tuffaceous, rhyolitic, volcaniclastic
146	Capitol Reef Community Pit	Sandstone, buff and reddish-brown	Sandstone
147	Quality Stone Material Site	Sandstone, massive, large blocks of reddish brown, blocks measure 4'x'4'x4' up to 5'x5'x5'	Sandstone
148	American Stone quarry (DOGM's Torrey)	Sandstone, reddish brown	Sandstone
149	Sandstone Mountain	Sandstone, v. friable, light to dark reddish brown	Sandstone
150	Fire Pit #1-4	Sandstone, red to reddish brown to white, liesegang bands, v. friable	Sandstone
151	Snow White	Marble, white to black-and-white, banded, hard, coarsely crystalline	Marble
152	Dolomite Stone #1	Dolomite, white and pink, impure in parts	Dolomite
153	Leisegang #9 (Butcher Knife)	Sandstone, some with liesegang color banding	Sandstone
154	Black Ridge #1	Sandstone, massive, ledge-forming, liesegang banding along fractures	Sandstone
155	Limestone Mesa (Desert Bronze) material site	Limestone, v. flaggy, light pinkish brown, hard	Limestone
156	Virgin Community Pit	Limestone, v. flaggy, light pinkish brown, hard	Limestone

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IDNo	Name	Other_characteristics	Extraction_Fractures_Cleavability	Product_Dimension_Fractures_Cleavability
140	Cream Time (DOGM's Mayfield)	Light brown color; durable, breaks into flaggy blocks	Favorable with respect to extraction	Favorable with respect to product dimensions.
141	Day quarry (DOGM's Temple Strike)	--	Favorable with respect to extraction	Favorable with respect to product dimensions.
142	Nielsen quarry	Columnar jointing; very hard; large mineral phenocrysts	Not Applicable.	Not applicable
143	KSC #1 - Kanosh Stone Co.	Color banding is prominent	Favorable with respect to extraction	Unfavorable with respect to product dimensions
144	KSC #2 - Kanosh Stone Co. (DOGM's UTU 79911)	--	Not Applicable.	Not applicable
145	DSP Stone (Diversified Stone Products?)	--	Not Applicable.	Not applicable
146	Capitol Reef Community Pit	General lack of material for collection	Favorable with respect to extraction	Favorable with respect to product dimensions.
147	Quality Stone Material Site	Massive, unbroken, unfractured sandstone capable of yielding large blocks; color is important; Mined from 8-10' thick ledge of sandstone	Favorable with respect to extraction	Favorable with respect to product dimensions.
148	American Stone quarry (DOGM's Torrey)	Flaggy nature, breaks into 1"-4" thick blocks; reddish brown color; durability and hardness	Favorable with respect to extraction	Favorable with respect to product dimensions.
149	Sandstone Mountain	Too friable and not durable	Unfavorable with respect to extraction	Unfavorable with respect to product dimensions
150	Fire Pit #1-4	--	Unfavorable with respect to extraction	Unfavorable with respect to product dimensions
151	Snow White	Marble character, hard, color banding	Not Applicable.	Unfavorable with respect to product dimensions
152	Dolomite Stone #1	--	Not Applicable.	Unfavorable with respect to product dimensions
153	Leisegang #9 (Butcher Knife)	--	Favorable with respect to extraction	Unfavorable with respect to product dimensions
154	Black Ridge #1	Liesegang banding in sandstone is most valuable raw material for Thirsty Stone products; see website	Favorable with respect to extraction	Unfavorable with respect to product dimensions
155	Limestone Mesa (Desert Bronze) material site	Hardness and durability; color	Favorable with respect to extraction	Favorable with respect to product dimensions.
156	Virgin Community Pit	Material is very widespread and active pit is large	Favorable with respect to extraction	Favorable with respect to product dimensions.

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IDNo	Name	Influence_of_Texture	Uniform_Thickness	Lithology_Hardness_Durability	Rock_Quality_Suitability
140	Cream Time (DOGM's Mayfield)	No Influence	Yes	Advantageous	Excellent quality
141	Day quarry (DOGM's Temple Strike)	Likely influence	Yes	Advantageous	Good to excellent
142	Nielsen quarry	No Influence	No	Moderately Advantageous	Chemically pure for industrial silica
143	KSC #1 - Kanosh Stone Co.	No Influence	No	Advantageous	Unknown
144	KSC #2 - Kanosh Stone Co. (DOGM's UTU 79911)	No Influence	No	Moderately Advantageous	Unknown
145	DSP Stone (Diversified Stone Products?)	No Influence	No	Moderately Advantageous	Limited reserve depends on amount of banded stone
146	Capitol Reef Community Pit	Likely influence	Yes	Moderately Advantageous	Only a limited supply is available
147	Quality Stone Material Site	Likely influence	Yes	Advantageous	Consistent hardness of rock and thickness of unit are distinct advantages for this deposit
148	American Stone quarry (DOGM's Torrey)	Likely influence	Yes	Advantageous	Large amount of flaggy sandstone is present over a large area
149	Sandstone Mountain	No Influence	No	Disadvantageous	Friable nature imparts little or no strength to rock for intended purposes
150	Fire Pit #1-4	No Influence	No	Disadvantageous	Friable nature imparts little or no strength to rock for intended purposes
151	Snow White	No Influence	No	Advantageous	Fair
152	Dolomite Stone #1	No Influence	No	Advantageous	Unknown
153	Leisegang #9 (Butcher Knife)	No Influence	No	Moderately Advantageous	Suitable for boulders
154	Black Ridge #1	No Influence	No	Moderately Advantageous	The only product is found along fractures present in large boulders of massive sandstone
155	Limestone Mesa (Desert Bronze) material site	Likely influence	Yes	Moderately Advantageous	Moderate to high durability for flagstone
156	Virgin Community Pit	Likely influence	Yes	Advantageous	Rock quality is good to excellent; high percentage and difficulty in managing of waste is limiting factor

IDNo	Name	Size	Ease_of_Extraction	Extent_of_Deposit	Reserve_Limits_Overburden
140	Cream Time (DOGM's Mayfield)	Large	Moderately easy (extraction by ripping)	Extended	Unknown reserve; 15 ft overburden
141	Day quarry (DOGM's Temple Strike)	Small	Moderately easy	Extended	Unknown reserve
142	Nielsen quarry	Medium	Moderately easy	Extended	Extensive reserves > 10 years
143	KSC #1 - Kanosh Stone Co.	Small	Moderately easy (extraction by ripping)	Limited or Confined	Limited to thin plug / flow unit
144	KSC #2 - Kanosh Stone Co. (DOGM's UTU 79911)	Small-Material site	Moderately easy	Limited or Confined	Unknown reserve
145	DSP Stone (Diversified Stone Products?)	Small	Moderately easy	Limited or Confined	Overburden is a problem
146	Capitol Reef Community Pit	Small-Material site	Very easy (no mechanized equipment required, although it might be used)	Extended	Not applicable
147	Quality Stone Material Site	Large-Material site	Moderately difficult (blasting necessary)	Extended	Several thousand tons in mine area, large adjacent undeveloped reserves.
148	American Stone quarry (DOGM's Torrey)	Medium	Very easy (no mechanized equipment required, although it might be used)	Extended	Several thousand tons in mine area, large adjacent undeveloped reserves.
149	Sandstone Mountain	Small	Very easy (no mechanized equipment required, although it might be used)	Limited or Confined	Little overburden
150	Fire Pit #1-4	Small	Very easy (no mechanized equipment required, although it might be used)	Limited or Confined	Little overburden
151	Snow White	Medium	Moderately difficult (blasting likely required, or extraction otherwise made difficult through extensive overburden, unfavorable structure, etc.)	Extended	Unknown reserve
152	Dolomite Stone #1	Small-Material site	Moderately difficult (blasting likely required, or extraction otherwise made difficult through extensive overburden, unfavorable structure, etc.)	Limited or Confined	Unknown reserve
153	Leisegang #9 (Butcher Knife)	Medium-Material site	Moderately easy (extraction by ripping)	Extended	Limited reserve
154	Black Ridge #1	Medium	Moderately difficult	Limited or Confined	Extensive reserve with considerable overburden which limits reserve
155	Limestone Mesa (Desert Bronze) material site	Medium-Material site	Moderately easy (extraction by ripping)	Extended	Extensive > 10 year reserve
156	Virgin Community Pit	Medium-Material site	Very easy (no mechanized equipment required, although it might be used)	Extended	Little overburden; unknown reserve

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IDNo	Name	Number_Products	Known_Products	Acres	Mining_Method	Hand_Methods
140	Cream Time (DOGM's Mayfield)	Medium (3-5 products)	Flagstone, building stone	20	Hand-mechanized combined	Hand split, sort
141	Day quarry (DOGM's Temple Strike)	Medium (3-5 products)	Flagstone, river cobbles		Hand-mechanized combined	Hand split, sort
142	Nielsen quarry	Small (1 - 2 products)	Dimension stone; aggregate; blocks	3	Mechanized	None
143	KSC #1 - Kanosh Stone Co.	Small (1 - 2 products)	Basket sculpting rock, aquarium rock, miscellaneous decorative objects; landscape rock	<1	Hand-mechanized combined	Hand split, sort
144	KSC #2 - Kanosh Stone Co. (DOGM's UTU 79911)	Unknown; currently being explored	Basket sculpting rock, aquarium rock, miscellaneous decorative objects; banded due to liesegang	<1	Hand-mechanized combined	Hand split, sort
145	DSP Stone (Diversified Stone Products?)	Small (1 - 2 products)	Basket sculpting rock; aquarium rock; banded due to liesegange	2	Operator hasn't done any work since notified that $25,000 bond would be required before starting work.	
146	Capitol Reef Community Pit	Small (1 - 2 products)	Flagstone, large blocks, boulders	5	Hand only	Surface collection
147	Quality Stone Material Site	Small (1 - 2 products)	Rough blocks for dimension stone sawing	10	Hand-mechanized combined	Hand split, sort
148	American Stone quarry (DOGM's Torrey)	Medium (3-5 products)	Reddish brown flaggy sandstone	10	Hand-mechanized combined	Hand split, sort
149	Sandstone Mountain	Unknown; currently being explored	Friable sandstone with intensely reddish orange color	<1	Hand-mechanized combined	Hand split, sort
150	Fire Pit #1-4	Unknown; currently being explored	Friable sandstone with intensely reddish orange color	0.25	Hand-mechanized combined	Hand split, sort
151	Snow White	Small (1 - 2 products)	Crushed landscape rock; blocks and slabs for sawing for veneer; filler for paper industry	4.5	Hand-mechanized combined	Hand split, sort
152	Dolomite Stone #1	Small (1 - 2 products)	Dolomite stone	3	Hand-mechanized combined	Hand split, sort
153	Leisegang #9 (Butcher Knife)	Small (1 - 2 products)	Landscape boulders, flagstone? Past production = 200 tons	1	Hand-mechanized combined	Hand split, sort
154	Black Ridge #1	Small (1 - 2 products)	Liesegang-banded boulders and rock	5	--	--
155	Limestone Mesa (Desert Bronze) material site	Medium (3-5 products)	Flagstone products: 3/8"-3/4"; 3/4"-1-1/4"; 1-1/4"-2" (30% of production); 2"-4" (30% of production); 4"-12"	5	Hand-mechanized combined	Hand split, sort
156	Virgin Community Pit	Small (1 - 2 products)	Boulders, blocks, flagstone	16	Hand-mechanized combined	Hand split, sort

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Mining_Description	Production_rate
140	Cream Time (DOGM's Mayfield)	Rip/loosen with dozer; dig and load with track excavator	3,000 t/y; 2-5 pallets/ d/person; ship 1 semi load/day of 10 11 pallets each
141	Day quarry (DOGM's Temple Strike)	Dig with hyd excavator	--
142	Nielsen quarry	Drill and blast; load with hyd excavator	--
143	KSC #1 - Kanosh Stone Co.	--	Past production: <50 tons
144	KSC #2 - Kanosh Stone Co. (DOGM's UTU 79911)	Operator proposes trenching across 300' x 50' area for prospecting purposes; Operator hasn't done any work since notified that $25,000 bond would be required before starting work.	--
145	DSP Stone (Diversified Stone Products?)	--	--
146	Capitol Reef Community Pit	Surface collection only, no mechanized equipment	--
147	Quality Stone Material Site	Drill and blast; drill and blast again to get proper size amenable to cutting to dimension in saw plant	--
148	American Stone quarry (DOGM's Torrey)	Loosen with hyd excavator; hand sort, and palletize; hauls to own yard in Salt Lake and some direct sales out-of-state	10,000/ yr in some years since 1983
149	Sandstone Mountain	--	--
150	Fire Pit #1-4	--	--
151	Snow White	Drill, blast, dig with hyd excavator	None at this time; past production 200 tons
152	Dolomite Stone #1	Drill, blast, dig with hyd excavator	--
153	Leisegang #9 (Butcher Knife)	Drill, blast, dig with hyd excavator	--
154	Black Ridge #1	Dig with track excavator and load, haul to Tucson AZ for processing	--
155	Limestone Mesa (Desert Bronze) material site	Dig with track excavator, move to splitting area, and palletize	50-60 pallets/week by 5 to 7 laborers; new contract with BLM to remove 10,000 tons in 5 years; production per person is 5-15 pallets/week on 300 d/year schedule; produced 975 tons so far throug time of visit in 2004 and 106 tons in 2003; 11 pallets per truck load
156	Virgin Community Pit	Dig with mechanized equipment, haphazardly	Get from LR 2000

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Processing_onsite	Work_schedule	Personnel	Buildings
140	Cream Time (DOGM's Mayfield)	Split and palletize	Year-round, depending on weather; 5 d/wk	5 laborers, 1 owner-operator	--
141	Day quarry (DOGM's Temple Strike)	--	--	--	--
142	Nielsen quarry	--	--	--	--
143	KSC #1 - Kanosh Stone Co.	--	--	--	--
144	KSC #2 - Kanosh Stone Co. (DOGM's UTU 79911)	--	Few days per year	--	--
145	DSP Stone (Diversified Stone Products?)	--	Few days per year	--	--
146	Capitol Reef Community Pit	--	--	--	--
147	Quality Stone Material Site	Haul to Price for further processing	--	2 laborers	--
148	American Stone quarry (DOGM's Torrey)	Hand sort and palletize; saw to cut stone on outcrop in some areas; 95% is processed with cris-cutter	up 7 d/week; 6-8 mos/yr if market and weather permits	3 laborers	--
149	Sandstone Mountain	--	--	--	--
150	Fire Pit #1-4	--	--	--	--
151	Snow White	--	--	--	--
152	Dolomite Stone #1	--	--	--	--
153	Leisegang #9 (Butcher Knife)	--	--	--	--
154	Black Ridge #1	None	--	--	--
155	Limestone Mesa (Desert Bronze) material site	Hand select and palletize	300 days/year	5-7 workers, 1 operator	--
156	Virgin Community Pit	--	--		--

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IDNo	Name	Equipment	Product_inventory
140	Cream Time (DOGM's Mayfield)	1 MixRight tumbler ($30,000); 1 track excavator Volvo EC360; 1 dozer Cat D-8k; 1 Ford PU; 1 Cat wheel loader 955; 1 dump truck; 1 4-wheel flat bed tow trailer; 1 cris-cutter; 1 generator 8kva; 1 flatbed semi trailer; 2 volvo wheel loaders 90c, 120c; 1 New Holland wheel loader; 1 compressor.	8, 4-6" flagstone, sandy LS; 23, 2-3" flagstone, sandy LS; 40, 1" flagstone, vertical
141	Day quarry (DOGM's Temple Strike)	1 track excavator, Kato; 2 forklifts; 1 cris-cutter; 2 trailers; 1 2 ton truck, F350	12, 1" flagstone; 31, 2-3" flagstone; 4, 8-10" cut boulders split on cris-cutter; 66, 3-6" blocky flagstone
142	Nielsen quarry	No equipment at site	--
143	KSC #1 - Kanosh Stone Co.	--	--
144	KSC #2 - Kanosh Stone Co. (DOGM's UTU 79911)	1 backhoe (Star Rental Co.); 1 dump truck	--
145	DSP Stone (Diversified Stone Products?)	1 backhoe (Star Rental Co.); 1 dump truck	--
146	Capitol Reef Community Pit		--
147	Quality Stone Material Site	1 track loader D7K; 1 wheel loader TD 500 scoopmobile; 1 haul truck 12-ton flatbedd Mack	--
148	American Stone quarry (DOGM's Torrey)	2 water trucks, Transtar 4200 (dual axle); Loadstar 1700 (single axle); 1 cris cutter; 1 outcrop saw (home made); 1 wheel loader (large)	all rock is reddish brown sandstone--99 pallets, 2" flagstone; 40 pallets, 2"x48" sawed flagstone; 4 pallets, 2"x4'x4' flagstone; 67pallets, 2'4" buff flagstone; 13 pallets, 3"x3"x4' sawn block flagstone; 108 pallets, 2-3" buff flagstone block; 3 pallets, 12" sawn block; 82 pallets, 2-4" buff flagstone block.
149	Sandstone Mountain	--	--
150	Fire Pit #1-4	--	--
151	Snow White	1 dozer; 1 airtrack drill; 1 track backhoe; 1 haul truck; pickup for personnel	--
152	Dolomite Stone #1	Oper. Plan: 1 wheel loader; 1 track excavator; 1 D-8 dozer; 1 10-wheel dump truck 12-15 ton size.	--
153	Leisegang #9 (Butcher Knife)	1 track airdrill; 1 track excavator; 1 wheel loader; 1 haul truck	--
154	Black Ridge #1	Track excavator; wheel loader; haul truck	--
155	Limestone Mesa (Desert Bronze) material site	1, Cat 320C track excavator; 1 forklift, large; 1 semi flatbed, 20-ton; 1 trailer flatbed, 10-ton; 1 wheel loader Volvo L90C 3 cu yd	Count in pallets of flagstone: 81, 3/4"-1-1/4"; 57, 2"-4"; 40, 5-10"; 10, 2" select; 6 1/2"-3/4" select; 40, standup 1"-2"; 10, 1" patio; and 20, 2" patio.
156	Virgin Community Pit	Varies with operator: Southwest stone uses tr excavator, forklift, and semis; others use bucket, hammer, and wheel loader; all use hand sorting and stack on pallets	--

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Sales_price	Market_description	Destination
140	Cream Time (DOGM's Mayfield)	1" flagstone = $240/ton; 2" flagstone = $180/ton; 3-5" flagstone = $75/ton	Sells to broker in Calif.	California
141	Day quarry (DOGM's Temple Strike)	--	--	--
142	Nielsen quarry	--	--	--
143	KSC #1 - Kanosh Stone Co.	--	--	--
144	KSC #2 - Kanosh Stone Co. (DOGM's UTU 79911)	Material site sale terms: $20/ton	--	--
145	DSP Stone (Diversified Stone Products?)	--	--	--
146	Capitol Reef Community Pit	$8.75/ton (1993)	--	--
147	Quality Stone Material Site	$5.56/ton (to BLM)	--	--
148	American Stone quarry (DOGM's Torrey)	Appraised value by BLM: $5.56/ton (2 sales in area); $ 8.36/ton (community pit by Michael Jackson)	--	--
149	Sandstone Mountain	--	--	--
150	Fire Pit #1-4	--	--	--
151	Snow White	--	--	--
152	Dolomite Stone #1	--	For landscape purposes	--
153	Leisegang #9 (Butcher Knife)	--	Building veneer; decorative rock, landscape rock	--
154	Black Ridge #1	Considerable processing needed before Thirsty Stone products sold	Thirsty Stone products, see website	--
155	Limestone Mesa (Desert Bronze) material site	10,000 tons over 5 years @ $10/ton appraised value; so far have paid $8200.	Minneapolis, Salt Lake City; Austin, San Francisco; Seattle, Portland, Missouri; did not get percentages; for use in title, patio, water features, landscaping, building veneer, and rockwall	--
156	Virgin Community Pit	$10/ton + $2/ton for reclamation	Landscape and rock walls	Local, mostly

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IDNo	Name	Prod_1995	Prod_1996	Prod_1997	Prod_1998	Prod_1999	Prod_2000	Prod_2001	Prod_2002	Prod_2003	Prod_2004	Max_prod
140	Cream Time (DOGM's Mayfield)				0	0	350	833	2500	3000	2600	3000
141	Day quarry (DOGM's Temple Strike)							413	405	NR	NR	413
142	Nielsen quarry											
143	KSC #1 - Kanosh Stone Co.										0	
144	KSC #2 - Kanosh Stone Co. (DOGM's UTU 79911)											
145	DSP Stone (Diversified Stone Products?)											
146	Capitol Reef Community Pit											
147	Quality Stone Material Site											
148	American Stone quarry (DOGM's Torrey)	200	200	200	300	100	568	600	600	0	0	600
149	Sandstone Mountain											
150	Fire Pit #1-4		8	5	2	3	2	2	0.5	0.5	0.75	3
151	Snow White						50	1000	0	0	0	1000
152	Dolomite Stone #1				0	0	0.2	40	0	0	0	40
153	Leisegang #9 (Butcher Knife)							400	200	0	0	400
154	Black Ridge #1	0	0	1240	1372	1990	0	615	0	0	1000	1990
155	Limestone Mesa (Desert Bronze) material site				NR	NR	NR	NR	NR	NR	NR	
156	Virgin Community Pit											

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IDNo	Name	Comments
140	Cream Time (DOGM's Mayfield)	Landowner, Gerald Willden, Mayfield, UT SITLA production data here is CONFIDENTIAL
141	Day quarry (DOGM's Temple Strike)	--
142	Nielsen quarry	--
143	KSC #1 - Kanosh Stone Co.	--
144	KSC #2 - Kanosh Stone Co. (DOGM's UTU 79911)	References: (authors) Pete Rowley; Cunningham; Steven (USGS); GSA Guidebook (2002) @ DOGM
145	DSP Stone (Diversified Stone Products?)	--
146	Capitol Reef Community Pit	--
147	Quality Stone Material Site	--
148	American Stone quarry (DOGM's Torrey)	See production column
149	Sandstone Mountain	No data
150	Fire Pit #1-4	--
151	Snow White	North pit 37.4040, 113.9750
152	Dolomite Stone #1	--
153	Leisegang #9 (Butcher Knife)	Startup in 2001
154	Black Ridge #1	Expect 1000 t in 2004
155	Limestone Mesa (Desert Bronze) material site	--
156	Virgin Community Pit	Get from BLM's LR 2000

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IDNo	Name	Alt_Name	Location_State	Surface_Mgmt	Case_Type	Visited	Photos	Sampled	Date_Visit	Status
157	Windy #3	--	UT	St George FO	Claims	Yes	Yes	Yes	June 16 2004	Active
158	Harrisburg-Picture Spring 1,2	--	UT	St George FO	Claims	Yes	Yes	Yes	June 15 2004	Inactive
159	Honey Onyx	--	UT	State of Utah lease	State of Utah lease	No	No	No	--	Active
160	Huff Creek	--	UT	Unknown	Unknown	No	No	No	--	Inactive
161	Aragonite Mine	--	UT	Salt Lake FO	Claims	No	No	No	--	Active
162	Nine Mile (Bown State lease)	Bown State of Utah Lease	UT	State of Utah lease	State of Utah lease	No	No	No	--	Active
163	B & W #1 claims	--	UT	Fillmore FO	Claims	No	No	No	--	Proposed
164	Little Creek Picture Sandstone	--	UT	Unknown	Unknown	No	No	No	--	Inactive
165	Wonder #2	Wonder #2	UT	Richfield FO	Material site	No	No	No	--	Inactive
166	Lynn School Quarry (DOGM's Lynn Pass)	Lynn Pass	UT	Private	Private	No	No	No	--	Active
167	Allen Claims	--	UT	St George FO	Claims	No	No	No	--	Active
168	Cobble/Sandstone (State lease 47950)	State of Utah Lease 47950	UT	State of Utah lease	State of Utah lease	No	No	No	--	Inactive
169	Moenkopi Hite quarry	--	UT	State of Utah lease	State of Utah lease	No	No	No	--	Inactive
170	Mystery - ML 45848	--	UT	Unknown	Unknown	No	No	No	--	Active
171	Indian Queen	--	UT	Unknown	State of Utah lease	No	No	No	--	Active
172	Briggs Quarry	Chocolate Charcoal	UT	Private	Split estate-Claims	No	No	No	--	Active
173	Glen Goff Property	--	UT	Private	Private	No	No	No	--	Active
174	Bald Knoll	--	UT	Unknown	Unknown	No	No	No	--	Active
175	Carol Mine	--	UT	Unknown	Unknown	No	No	No	--	Active
176	Rapunzel	--	UT	Unknown	Unknown	No	No	No	--	Active
177	Henrietta (Black Hills)	Black Hills	UT	Sawtooth NF	Claims	No	No	No	--	Inactive
178	Red Chief	--	UT	State of Utah lease	State of Utah lease	No	No	No	--	Inactive
179	Snow White	--	UT	Unknown	Unknown	No	No	no	--	Inactive
180	Martin-Brown/Wilford #2	--	UT	Price FO	Claims	No	No	No	--	Active
181	Amis #1	--	UT	Private	Private	No	No	No	--	Active
182	Italian Tan	--	UT	Unknown	Unknown	No	No	No	--	Proposed
183	ML 43854 & ML 982	--	UT	State of Utah lease	State of Utah lease	No	No	No	--	Active
184	Strawberry River	--	UT	Unknown	Unknown	No	No	No	--	Active
185	Wah Wah Red	--	UT	Fillmore FO	Unknown	No	No	No	--	Active

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IDNo	Name	Map_Name	Type_Site	Claim_Name	BLM_Case	SubTerra_Number	UT_DOGM_ID
157	Windy #3	St George 100k	Quarry	--	UTU 079710	s530071	S0530071
158	Harrisburg-Picture Spring 1,2	St George 100k	Quarry	--	UTU 068571	s530028	s0530028
159	Honey Onyx	Nephi 100 k	Quarry	--	--	s230027	s230027
160	Huff Creek	Salt Lake City 100 k	Quarry	--	--	s430020	s430020
161	Aragonite Mine	Salt Lake City 100 k	Quarry	--	--	m450031	m450031
162	Nine Mile (Bown State lease)	Manti 100k	Quarry	--	--	s390010	s390010
163	B & W #1 claims	Wah Wah Mtns. North 100 k	Quarry	--	UTU 070681	s270049	s270049
164	Little Creek Picture Sandstone	St George 100k	Quarry	--	--	m530038	m530058
165	Wonder #2	Richfield 100K	Quarry	--	UTU 071573	s410025	s410025
166	Lynn School Quarry (DOGM's Lynn Pass)	Grouse Creek 100k	Quarry	--	--	s030046	s030046
167	Allen Claims	St George 100k	Quarry	Brown Sandstone	UTU 069246	s450032;s530019	s450032
168	Cobble/Sandstone (State lease 47950)	St George 100k	Quarry	--	--	s530023	s530023
169	Moenkopi Hite quarry	Hite Crossing 100 k	Quarry	--	--	s370093	s370093
170	Mystery - ML 45848	Moab 100 k	Quarry	--	--		s190034
171	Indian Queen	Wah Wah Mtns. North 100 k	Quarry	--	--	m010019	m010019
172	Briggs Quarry	Grouse Creek 100k	Quarry	--	--	s030058	s030058
173	Glen Goff Property	Manti 100k	Quarry	--	--	s390014	s390014
174	Bald Knoll	Kanab 100k	Quarry	--	--	s250012	s250012
175	Carol Mine	Wah Wah Mtns. South 100 k	Quarry	--	--	--	s010064
176	Rapunzel	Lynndyl 100K	Quarry	--	--		s230083
177	Henrietta (Black Hills)	Grouse Creek 100k	Quarry	Henrietta #21	--	s030028	s030028
178	Red Chief	Huntington 100 k	Quarry	--	--	s150083	s150083
179	Snow White	Huntington 100 k	Quarry	--	--	s150084	s150084
180	Martin-Brown/Wilford #2	Price 100 k	Quarry	--	UTU 078772	s070037	s070037
181	Amis #1	Price 100 k	Quarry	--	--	s490038	s490038
182	Italian Tan	Price 100 k	Quarry	--	--		s070038
183	ML 43854 & ML 982	Richfield 100K	Quarry	--	--	s270053	s270053
184	Strawberry River	Rush Valley	Quarry	--	--	s130008	s130008
185	Wah Wah Red	Wah Wah Mtns. North 100 k	Quarry	--	--	--	s270102

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IDNo	Name	UT_SITLA_ID	Data_Source	Operator_Name
157	Windy #3	--	Rick Rymerson St George FO; SubTerra (2004); UT DOGM	Color Country Rock Preston (Lonny) Hafen
158	Harrisburg-Picture Spring 1,2	--	Rick Rymerson St George FO; SubTerra (2004); UT DOGM	Thirsty Stone Resources www.thirstystone.com, John Halton
159	Honey Onyx	47667; 48109	UT DOGM files, SubTerra (2004); John Blake Utah SITLA	A & R Leasing, Russ Feller
160	Huff Creek	--	UT DOGM files; SubTerra (2004)	Adkins Rock Products, John Adkins or Wes Hansen
161	Aragonite Mine	--	Mike Ford, SLFO; UT DOGM files; SubTerra (2004)	American Stone, Lon Thomas
162	Nine Mile (Bown State lease)	ML 47244	UT DOGM files, SubTerra (2004); John Blake Utah SITLA	Bown, Danny
163	B & W #1 claims	--	UT DOGM files, SubTerra (2004)	Bradshaw, Neil/3-H Landscape
164	Little Creek Picture Sandstone	--	UT DOGM files; SubTerra (2004)	Thirsty Stone Resources www.thirstystone.com, John Halton
165	Wonder #2	--	UT DOGM files, SubTerra (2004)	Diversified Stone Products, Tony Aguiar
166	Lynn School Quarry (DOGM's Lynn Pass)	--	Mike Ford, SLFO; UT DOGM files; SubTerra (2004)	Erickson Stone, Todd Erickson
167	Allen Claims	--	UT DOGM files; SubTerra (2004)	A & R Leasing, Russ Feller
168	Cobble/Sandstone (State lease 47950)	ML 47950 MP	UT DOGM files, SubTerra (2004); John Blake Utah SITLA	A & R Leasing, Russ Feller
169	Moenkopi Hite quarry	47005	UT DOGM files, SubTerra (2004); John Blake Utah SITLA	Hansen, Bruce Stone quarries
170	Mystery - ML 45848	--	UT DOGM files	Hill, James
171	Indian Queen	--	UT DOGM files; SubTerra (2004)	Applegate, Gary, Indian Queen Marble LLC
172	Briggs Quarry	--	Mike Ford, SLFO; UT DOGM files; SubTerra (2004)	Gold Star Stone, Barry Peterson, owner
173	Glen Goff Property	--	UT DOGM files, SubTerra (2004)	Sorenson, Steven Lamar
174	Bald Knoll	--	UT DOGM files, SubTerra (2004)	Carter, Mark, MMG Mining
175	Carol Mine	--	UT DOGM files	Penney, Dave, Penney's Gemstones
176	Rapunzel	--	UT DOGM files	Penney, Dave, Penney's Gemstones
177	Henrietta (Black Hills)	--	UT DOGM files; SubTerra (2004)	Peterson, James
178	Red Chief	ML 48636 MP	UT DOGM; John Blake Utah SITLA; SubTerra (2004)	Quality Building Stone, Weston Hansen
179	Snow White	--	UT DOGM files; SubTerra (2004)	Quality Building Stone, Weston Hansen
180	Martin-Brown/Wilford #2	--	UT DOGM files; SubTerra (2004)	Quality Building Stone, Weston Hansen
181	Amis #1	--	Mike Ford, SLFO; UT DOGM files; SubTerra (2004)	Quality Building Stone, Weston Hansen
182	Italian Tan	--	UT DOGM files	Quality Building Stone, Weston Hansen
183	ML 43854 & ML 982	43854	UT DOGM files, SubTerra (2004); John Blake Utah SITLA	Robison, Robert
184	Strawberry River	--	UT DOGM files; SubTerra (2004)	Peatross, Peatross, Rock-It Stone Works
185	Wah Wah Red	--	UT DOGM files	Rogers, Dale

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IDNo	Name	Operator_Address	Operator_State	Operator_Tele	Location_Descr
157	Windy #3	291 E 1400 S Suite 1 St George UT 84790	UT	435-652-1805	--
158	Harrisburg-Picture Spring 1,2	860 E. 19th St Tucson AZ 85719	AZ	520.623.1396	--
159	Honey Onyx	688 E Chad Ranch Rd Veyo, UT 84742	UT	435-574-9300	--
160	Huff Creek	PO Box 386 462 N Main Coalville UT 84017	UT	435-336-2049	--
161	Aragonite Mine	4040 S. 300 W Salt Lake City, UT	UT	801-262-4300	--
162	Nine Mile (Bown State lease)	595 E 600 S PO Box 27 Manti, UT 84642-0027	UT	435-835-7542	--
163	B & W #1 claims	N 9 Cove Dr PO Box 1054 Cedar City UT 84720	UT	435-586-1175; 435-387-2770	--
164	Little Creek Picture Sandstone	860 E. 19th St Tucson AZ 85719	AZ	520.623.1396	--
165	Wonder #2	550 S Airway Dr PO Box 265 Fillmore, UT 84631	UT	435-743-5842	--
166	Lynn School Quarry (DOGM's Lynn Pass)	930 E 2755 S PO Box 125 Almo, ID 83312	ID	208-824-5548	Cotton Thomas ridge of Goose Cr. Mtns
167	Allen Claims	688 E Chad Ranch Rd Veyo, UT 84742	UT	435-574-9300	.25 mi west of RR in Vernon Hills
168	Cobble/Sandstone (State lease 47950)	688 E Chad Ranch Rd Veyo, UT 84742	UT	435-574-9300	--
169	Moenkopi Hite quarry	PO Box 341 Kanab, UT 84741	UT	435-644-3073	--
170	Mystery - ML 45848	741 Bittle Ln, Moab, UT 84532	UT	435-259-7757	--
171	Indian Queen	995 N Main Toole, UT 84074	UT	435-882-8664; 882-2865	--
172	Briggs Quarry	K Four Ranch Inc 1648 S 600 W PO Box 62 Oakley, ID 83346	ID	208-862-3620	East side of highest peak on Cotton Thomas ridge of Goose Cr. Mtns
173	Glen Goff Property	KSC Rocks 235 N Main Kanosh, UT 84637	UT	435-759-2639	W. side White Hills
174	Bald Knoll	3655 Lupin Way St George, UT 84790	UT	435-628-4330; 435-688-3055	--
175	Carol Mine	PO Box 312 Beaver UT 84713	UT	435-438-5522, 801-319-1727 cell	--
176	Rapunzel	PO Box 312 Beaver UT 84713	UT	435-438-5522, 801-319-1727 cell	--
177	Henrietta (Black Hills)	541 Blvd #2 Logan, UT 84321	UT	435-752-8262	--
178	Red Chief	993 W 14730 S Bluffdale UT 84065	UT	801-255-2911	--
179	Snow White	993 W 14730 S Bluffdale UT 84065	UT	801-255-2911	On Dry Mesa
180	Martin-Brown/Wilford #2	993 W 14730 S Bluffdale UT 84065	UT	801-255-2911	--
181	Amis #1	993 W 14730 S Bluffdale UT 84065	UT	801-255-2911	--
182	Italian Tan	993 W 14730 S Bluffdale UT 84065	UT	801-255-2911	--
183	ML 43854 & ML 982	5854 Ayshire Dr Salt Lake City UT	UT	801-261-0818	--
184	Strawberry River	3755 S 900 E Duchesne, UT	UT	435-738-2514	--
185	Wah Wah Red	455 N Main PO Box 668 Milford UT 84751	UT	435-387-5001, 387-7815	--

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Location_County	Tp	Rg	Sec&Sub	Lat_dd	Long_dd	UTM_E	UTM_N	UTM_Zone	Coll_Method
157	Windy #3	Washington	41 S	18 W	13 S1/2	37.2168	-113.8187	249889	4122645	12S	Recorded
158	Harrisburg-Picture Spring 1,2	Washington	41 S	14 W	23 nene	37.2125	-113.3882	288083	4121118	12S	Recorded
159	Honey Onyx	Sanpete	13 S	1 W	16 s2ne	39.6814	-111.9377	419584	4392819	12S	Copy from SubTerra
160	Huff Creek	Summit	3 N	6 E	13 nenw	40.9906	-111.2204	481458	4537735	12T	Copy from SubTerra
161	Aragonite Mine	Tooele	1 S	10 W	23 se, ne	40.7203	-112.9369	336413	4509514	12T	Read from ArcMap
162	Nine Mile (Bown State lease)	Sanpete	19 S	2 E	16 nene	39.1629	-111.6865	440694	4335081	12S	Copy from SubTerra
163	B & W #1 claims	Millard	24 S	14 W	29 nwse	38.6956	-113.4415	287671	4285831	12S	Copy from SubTerra
164	Little Creek Picture Sandstone	Washington	43 S	11 W	7 swne	37.0629	-113.1351	310404	4103700	12S	Calculated from trs
165	Wonder #2	Sevier	26 S	4 W	23 w2, ne	38.5265	-112.2034	395106	4264919	12S	Copy from SubTerra
166	Lynn School Quarry (DOGM's Lynn Pass)	Box Elder	13 N	17 W	2 nese	41.8719	-113.7611	270868	4639239	12T	Read from ArcMap
167	Allen Claims	Washington	43 S	15 W	21 e2se	37.0241	-113.5358	274423	4100550	12S	Copy from SubTerra
168	Cobble/Sandstone (State lease 47950)	Washington	43 S	16 W	10 ne, 3 all, 11 nenw	37.0629	-113.6333	265870	4105094	12S	Calculated from trs
169	Moenkopi Hite quarry	San Juan	34 S	15 E	32 w2se	37.7800	-110.2972	561885	4181644	12S	Copy from SubTerra
170	Mystery - ML 45848	Grand	24 S	20 E	2 sw	38.7531	-109.6760	615047	4290210	12S	Calculated from trs
171	Indian Queen	Beaver	26 S	13 W	33 sese, 34 nwsw	38.5082	-113.3170	297976	4264749	12S	Copy from SubTerra
172	Briggs Quarry	Box Elder	14 N	17 W	22 w2nw, 21 e2ne	41.9244	-113.7973	268052	4645164	12T	Read from ArcMap
173	Glen Goff Property	Sanpete	20 S	1 E	27 nwse, nw	39.0410	-111.7904	431595	4321627	12S	Copy from SubTerra
174	Bald Knoll	Kane	40 S	5 W	16 nwsw	37.3339	-112.4216	374063	4132862	12S	Calculated from trs
175	Carol Mine	Beaver	27 S	11 W	23 w2, 22 w2	38.4492	-113.0599	320246	4257666	12S	Calculated from trs
176	Rapunzel	Juab	11 S	7 W	5 swse	39.8959	-112.6552	358494	4417514	12S	Calculated from trs
177	Henrietta (Black Hills)	Box Elder	13 N	16 W	23 nene	41.8365	-113.6478	290074	4634751	12T	Read from ArcMap
178	Red Chief	Emery	19 S	10 E	16 nenw	39.1743	-110.8069	516676	4336133	12S	Copy from SubTerra
179	Snow White	Emery	19 S	13 E	15 swsw	39.1638	-110.4527	547282	4335098	12S	Copy from SubTerra
180	Martin-Brown/Wilford #2	Carbon	13 S	9 E	14 sene	39.6979	-110.8725	510928	4394237	12S	Copy from SubTerra
181	Amis #1	Utah	11 S	9 E	36 nw, 35 ne	39.8235	-110.8742	510766	4408173	12S	Read from ArcMap
182	Italian Tan	Carbon	13 S	9 E	14 nene	39.7054	-110.8708	511075	4395068	12S	Calculated from trs
183	ML 43854 & ML 982	Millard	23 S	6 W	2	38.8419	-112.4965	370124	4300296	12S	Calculated from trs
184	Strawberry River	Duchesne	4 S	7 W	16 se Uintah Mer.	40.1310	-110.6789	527359	4442346	12T	Copy from SubTerra
185	Wah Wah Red	Millard	25 S	13 W	26 nwnwse	38.6098	-113.2752	301897	4275932	12S	Calculated from trs

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Color	Geology	Generalized_Rock_Unit
157	Windy #3	Light brown	Shinarump Congl. Mbr of Chinle Form.	ShinarumpMbr
158	Harrisburg-Picture Spring 1,2	Light brown	Shinarump Congl. Mbr of Chinle Form.	ShinarumpMbr
159	Honey Onyx	--	--	--
160	Huff Creek	--	--	--
161	Aragonite Mine	--	Oquirrh Formation	Oquirrh
162	Nine Mile (Bown State lease)	--	Green River Formation (Eocene)	GreenRiver
163	B & W #1 claims	Black-White	--	--
164	Little Creek Picture Sandstone	--	--	--
165	Wonder #2	Light brown	--	--
166	Lynn School Quarry (DOGM's Lynn Pass)	Very light gray	Schist of Stevens Spring (Pre-Cambrian)	StevensSchist
167	Allen Claims	Light brown	Humbug Form.	Humbug
168	Cobble/Sandstone (State lease 47950)	--	--	--
169	Moenkopi Hite quarry	Reddish brown	Moenkopi Formation	Moenkopi
170	Mystery - ML 45848		--	--
171	Indian Queen	White	--	--
172	Briggs Quarry	Light gray	Quartzite of Clarks Basin (Cambrian)	Qtzte_ClarksBasin
173	Glen Goff Property		Green River Formation (Eocene)	GreenRiver
174	Bald Knoll	Orange brown	--	--
175	Carol Mine	--	--	--
176	Rapunzel	--	--	--
177	Henrietta (Black Hills)	--	Eureka Quartzite (Ordo.)	Eureka_Ordo
178	Red Chief	Red	--	--
179	Snow White	--	--	--
180	Martin-Brown/Wilford #2	--	--	--
181	Amis #1	--	Colton Formation	Colton
182	Italian Tan	--	--	--
183	ML 43854 & ML 982	--	--	--
184	Strawberry River	--	--	--
185	Wah Wah Red	--	--	--

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IDNo	Name	Lithologic_Description	Generalized_Lithology
157	Windy #3	Sandstone, blocky to flaggy, break naturally into slabs ranging from 1.5" to 20" thick	Sandstone
158	Harrisburg-Picture Spring 1,2	Sandstone, mainly in large blocks, brown liesegang banding parallel to fracture faces but diminishes with depth	Sandstone
159	Honey Onyx	Travertine onyx, limestone	Limestone
160	Huff Creek	--	--
161	Aragonite Mine	Aragonite, limestone, onyx	Limestone
162	Nine Mile (Bown State lease)	Limestone, flaggy.	Limestone
163	B & W #1 claims	Limestone, hydrothermally altered and recystallized organic, (Zebra marble)	Limestone
164	Little Creek Picture Sandstone	Sandstone.	Sandstone
165	Wonder #2	Sandstone, tuffaceous, with liesegang banding, rhyolitic; color banding important	Sandstone
166	Lynn School Quarry (DOGM's Lynn Pass)	--	--
167	Allen Claims	Sandstone, altered, containing liesegang banding; "wonderstone"; rhyolite	Sandstone
168	Cobble/Sandstone (State lease 47950)	Sandstone, quartzite, cobbles, boulders	Sandstone
169	Moenkopi Hite quarry	Sandstone	Sandstone
170	Mystery - ML 45848	Gemstones	Gemstones
171	Indian Queen	Marble , white	Marble
172	Briggs Quarry	Quartzite	Quartzite
173	Glen Goff Property	Limestone, flaggy, of weathered caprock	Limestone
174	Bald Knoll	Shale, burned	Shale
175	Carol Mine	Gemstones	Gemstones
176	Rapunzel	Gemstones, décor. Stone	Gemstones
177	Henrietta (Black Hills)	Quartzite	Quartzite
178	Red Chief	Sandstone, red (boulders) from talus	Sandstone
179	Snow White	Sandstone, very friable quartz, shaped into large blocks using explosives	Sandstone
180	Martin-Brown/Wilford #2	Sandstone boulders, arkosic, covered with caliche blasted into smaller blocks using explosive	Sandstone
181	Amis #1	Sandstone blocks cut from face for dimension stone	Sandstone
182	Italian Tan	Sandstone blocks cut from face for dimension stone	Sandstone
183	ML 43854 & ML 982	Limestone, crushed	Limestone
184	Strawberry River	--	--
185	Wah Wah Red	--	--

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IDNo	Name	Other_characteristics	Extraction_Fractures_Cleavability	Product_Dimension_Fractures_Cleavability
157	Windy #3	Unusual brown colored liesegang banding similar to Black Ridge #1; bands form parallel to fracture surfaces and ranging in width 1" - 2 ' from fracture surfaces	Favorable with respect to extraction	Favorable with respect to product dimensions.
158	Harrisburg-Picture Spring 1,2	--	Favorable with respect to extraction	Unfavorable with respect to product dimensions
159	Honey Onyx	--	Not Applicable.	--
160	Huff Creek	--	--	--
161	Aragonite Mine	--	Not Applicable.	--
162	Nine Mile (Bown State lease)	--	--	--
163	B & W #1 claims	Durable for landscape purposes	Not Applicable.	--
164	Little Creek Picture Sandstone	--	--	--
165	Wonder #2	--	Favorable with respect to extraction	Unfavorable with respect to product dimensions
166	Lynn School Quarry (DOGM's Lynn Pass)	--	Favorable with respect to extraction	Favorable with respect to product dimensions.
167	Allen Claims	--	--	--
168	Cobble/Sandstone (State lease 47950)	--	--	--
169	Moenkopi Hite quarry	--	--	--
170	Mystery - ML 45848	--	--	--
171	Indian Queen	--	--	--
172	Briggs Quarry	Hard and durable	--	--
173	Glen Goff Property	Moderately durable and decorative	Favorable with respect to extraction	Favorable with respect to product dimensions.
174	Bald Knoll	--	--	--
175	Carol Mine	--	--	--
176	Rapunzel	--	--	--
177	Henrietta (Black Hills)	--	--	--
178	Red Chief	--	--	--
179	Snow White	--	--	Favorable with respect to product dimensions.
180	Martin-Brown/Wilford #2	--	Favorable with respect to extraction	--
181	Amis #1	--	--	--
182	Italian Tan	--	--	--
183	ML 43854 & ML 982	--	--	--
184	Strawberry River	--	--	--
185	Wah Wah Red	--	--	--

IDNo	Name	Influence_of_Texture	Uniform_Thickness	Lithology_Hardness_Durability	Rock_Quality_Suitability
157	Windy #3	Likely influence	Yes	Advantageous	Good
158	Harrisburg-Picture Spring 1,2	No Influence	No	Moderately Advantageous	The only product is found along fractures present in large boulders of massive sandstone
159	Honey Onyx	Likely influence	No	Advantageous	Hand, durable
160	Huff Creek	--	--	--	--
161	Aragonite Mine	Likely influence	No	Advantageous	
162	Nine Mile (Bown State lease)	--	--	--	--
163	B & W #1 claims	No Influence	No	Advantageous	Durable for landscape rock
164	Little Creek Picture Sandstone	--	--	--	--
165	Wonder #2	No Influence	No	Advantageous	Unknown
166	Lynn School Quarry (DOGM's Lynn Pass)	Likely influence	Yes	Advantageous	--
167	Allen Claims	--	--	--	--
168	Cobble/Sandstone (State lease 47950)	--	--	--	--
169	Moenkopi Hite quarry	--	--	--	--
170	Mystery - ML 45848	--	--	--	--
171	Indian Queen	--	--	--	Unknown
172	Briggs Quarry	--	--	--	--
173	Glen Goff Property	No Influence	Yes	Advantageous	Moderate durability for flagstone
174	Bald Knoll	--	--	--	--
175	Carol Mine	--	--	--	--
176	Rapunzel	--	--	--	--
177	Henrietta (Black Hills)	--	--	--	--
178	Red Chief	No Influence	No	Advantageous	Unknown
179	Snow White	No Influence	No	Moderately Advantageous	Good durability for building stone
180	Martin-Brown/Wilford #2	No Influence	No	Advantageous	Unknown
181	Amis #1	--	--	--	--
182	Italian Tan	--	--	--	--
183	ML 43854 & ML 982	--	--	--	--
184	Strawberry River	--	--	--	--
185	Wah Wah Red	--	--	--	--

IDNo	Name	Size	Ease_of_Extraction	Extent_of_Deposit	Reserve_Limits_Overburden
157	Windy #3	Medium	Very easy (no mechanized equipment required, although it might be used)	Extended	Little overburden
158	Harrisburg-Picture Spring 1,2	Medium	Moderately easy	Limited or Confined	Little overburden; unknown reserve
159	Honey Onyx	Small	Moderately Easy (extraction by ripping)	Surficial	Limited thickness requires large footprint portion
160	Huff Creek	Small	--	--	--
161	Aragonite Mine	Small	Moderately Easy (extraction by ripping)	Extended	--
162	Nine Mile (Bown State lease)	Medium	--	--	Unknown
163	B & W #1 claims	Small	Difficult (blasting required under confined or otherwise difficult conditions).	Limited or Confined	Steeply dipping, limiting reserves
164	Little Creek Picture Sandstone	Large	--	--	
165	Wonder #2	Medium	Moderately Easy (extraction by ripping)	Limited or Confined	Unknown
166	Lynn School Quarry (DOGM's Lynn Pass)	Large	Moderately difficult (blasting likely required, or extraction otherwise made difficult through extensive overburden, unfavorable structure, etc.)	Extended	--
167	Allen Claims	Small	--	--	--
168	Cobble/Sandstone (State lease 47950)	Large	--	--	--
169	Moenkopi Hite quarry	Small	--	--	--
170	Mystery - ML 45848	Small	--	--	--
171	Indian Queen	Large	--	--	Extensive > 10 year reserve
172	Briggs Quarry	Large	--	--	--
173	Glen Goff Property	Small	Moderately Easy (extraction by ripping)	Extended	Limited reserves due to thin cap rock horizon
174	Bald Knoll	Large	--	--	--
175	Carol Mine	Small	--	--	--
176	Rapunzel	Small	--	--	--
177	Henrietta (Black Hills)	Small	--	--	--
178	Red Chief	Small	Very Easy (no mechanized equipment required, although it might be used)	--	Unknown
179	Snow White	Medium	Moderately difficult (blasting likely required, or extraction otherwise made difficult through extensive overburden, unfavorable structure, etc.)	Limited or Confined	Limited - favorable massive horizon < 15 ft thick
180	Martin-Brown/Wilford #2	Medium	Moderately difficult (blasting likely required, or extraction otherwise made difficult through extensive overburden, unfavorable structure, etc.)	Limited or Confined	Unknown
181	Amis #1	Medium	--	--	--
182	Italian Tan	Small	--	--	--
183	ML 43854 & ML 982	Medium	--	--	--
184	Strawberry River	Large	--	--	--
185	Wah Wah Red	Small	--	--	--

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IDNo	Name	Number_Products	Known_Products	Acres	Mining_Method	Hand_Methods
157	Windy #3	Small (1 - 2 products)	1-1.5" flagstone on pallets; 1-3 ton large blocks (largest percent to remain on site)	4.5	Hand-mechanized combined	Hand split, sort
158	Harrisburg-Picture Spring 1,2	Small (1 - 2 products)	Large blocks of sandstone containing liesegang banding	2	Hand-mechanized combined	Hand split, sort
159	Honey Onyx	Small (1 - 2 products)	Landscape rock, lapidary stone	--	--	--
160	Huff Creek	--	--	--	--	--
161	Aragonite Mine	Small (1 - 2 products)	--	--	--	--
162	Nine Mile (Bown State lease)		Flagstone, building stone	--	Hand-mechanized combined	Hand split, sort
163	B & W #1 claims	Small (1 - 2 products)	Landscape boulders	--	--	--
164	Little Creek Picture Sandstone			--	Hand-mechanized combined	Hand split, sort
165	Wonder #2	Small (1 - 2 products)	Material with purple color banding most important	--	--	--
166	Lynn School Quarry (DOGM's Lynn Pass)	Medium (3-5 products)	Flaggy quartzite	--	Hand-mechanized combined	Hand split, sort
167	Allen Claims	--	--	--	--	--
168	Cobble/Sandstone (State lease 47950)	--	--	--	--	--
169	Moenkopi Hite quarry	--	--	--	Mechanized	None
170	Mystery - ML 45848	--	--	--	--	--
171	Indian Queen	--	--	--	--	--
172	Briggs Quarry	--	Variety of flaggy quartzite products	--	Hand-mechanized combined	Hand split, sort
173	Glen Goff Property	Small (1 - 2 products)	Decorative flagstone	--	--	--
174	Bald Knoll	--	--	--	--	--
175	Carol Mine	--	--	--	--	--
176	Rapunzel	--	--	--	--	--
177	Henrietta (Black Hills)	--	--	--	Hand-mechanized combined	Hand split, sort
178	Red Chief	Small (1 - 2 products)	--	--	--	--
179	Snow White	Small (1 - 2 products)	Building Stone	--	--	--
180	Martin-Brown/Wilford #2	Small (1 - 2 products)	Building Stone	--	--	--
181	Amis #1	--	--	--	--	--
182	Italian Tan	--	--	--	--	--
183	ML 43854 & ML 982	--	--	--	--	--
184	Strawberry River	--	--	--	--	--
185	Wah Wah Red	--	--	--	--	--

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IDNo	Name	Mining_Description	Production_rate
157	Windy #3	Loosen with dozer; dig with hyd excavator; part is drilled and blasted	500 tons in two years, 2002-2003; none in 2004
158	Harrisburg-Picture Spring 1,2	Strip soil, drill and blast, loosen/load with hyd excavator; haul to Tucson AZ; sawed at plant	None in 2 years; ask DOGM
159	Honey Onyx	--	--
160	Huff Creek	--	--
161	Aragonite Mine	--	--
162	Nine Mile (Bown State lease)	Dig with hyd excavator	--
163	B & W #1 claims	--	--
164	Little Creek Picture Sandstone	--	--
165	Wonder #2	Dig with hyd excavator	--
166	Lynn School Quarry (DOGM's Lynn Pass)	--	--
167	Allen Claims	--	--
168	Cobble/Sandstone (State lease 47950)	--	--
169	Moenkopi Hite quarry	--	--
170	Mystery - ML 45848	--	--
171	Indian Queen	--	--
172	Briggs Quarry	--	--
173	Glen Goff Property	--	--
174	Bald Knoll	--	--
175	Carol Mine	--	--
176	Rapunzel	--	--
177	Henrietta (Black Hills)	--	--
178	Red Chief	--	--
179	Snow White	--	--
180	Martin-Brown/Wilford #2	--	--
181	Amis #1	--	--
182	Italian Tan	--	--
183	ML 43854 & ML 982	--	--
184	Strawberry River	--	--
185	Wah Wah Red	--	--

IDNo	Name	Processing_onsite	Work_schedule	Personnel	Buildings
157	Windy #3	--	Irregular; over 10 years intemittently	2-5 when operating	--
158	Harrisburg-Picture Spring 1,2	--	--	--	--
159	Honey Onyx	--	--	--	--
160	Huff Creek	--	--	--	--
161	Aragonite Mine	--	--	--	--
162	Nine Mile (Bown State lease)	--	--	--	--
163	B & W #1 claims	--	--	--	--
164	Little Creek Picture Sandstone	--	--	--	--
165	Wonder #2	--	--	--	--
166	Lynn School Quarry (DOGM's Lynn Pass)	--	--	--	--
167	Allen Claims	--	--	--	--
168	Cobble/Sandstone (State lease 47950)	--	--	--	--
169	Moenkopi Hite quarry	--	--	--	--
170	Mystery - ML 45848	--	--	--	--
171	Indian Queen	Drill, blast and crush on the site for use as aggregate	--	--	--
172	Briggs Quarry	--	--	--	--
173	Glen Goff Property	--	--	--	--
174	Bald Knoll	--	--	--	--
175	Carol Mine	--	--	--	--
176	Rapunzel	--	--	--	--
177	Henrietta (Black Hills)	--	--	--	--
178	Red Chief	--	--	--	--
179	Snow White	--	--	--	--
180	Martin-Brown/Wilford #2	--	--	--	--
181	Amis #1	--	--	--	--
182	Italian Tan	--	--	--	--
183	ML 43854 & ML 982	--	--	--	--
184	Strawberry River	--	--	--	--
185	Wah Wah Red	--	--	--	--

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IDNo	Name	Equipment	Product_inventory
157	Windy #3	1, dozer, D-8; 1, backhoe with hammer; 1 compressor-jack hammer drill; 1 wheel loader; 1 haul truck, semi.	30 large blocks
158	Harrisburg-Picture Spring 1,2	Track excavator; wheel loader; haul truck	100s of boulders on site
159	Honey Onyx	--	--
160	Huff Creek	--	--
161	Aragonite Mine	--	--
162	Nine Mile (Bown State lease)	--	--
163	B & W #1 claims	--	--
164	Little Creek Picture Sandstone	--	--
165	Wonder #2	Hyd excavator, Kobelco SK150 Mark 4	--
166	Lynn School Quarry (DOGM's Lynn Pass)	--	--
167	Allen Claims	--	--
168	Cobble/Sandstone (State lease 47950)	--	--
169	Moenkopi Hite quarry	--	--
170	Mystery - ML 45848	--	--
171	Indian Queen	--	--
172	Briggs Quarry	--	--
173	Glen Goff Property	Excavator	--
174	Bald Knoll	--	--
175	Carol Mine	--	--
176	Rapunzel	--	--
177	Henrietta (Black Hills)	--	--
178	Red Chief	--	--
179	Snow White	--	--
180	Martin-Brown/Wilford #2	--	--
181	Amis #1	--	--
182	Italian Tan	--	--
183	ML 43854 & ML 982	--	--
184	Strawberry River	--	--
185	Wah Wah Red	--	--

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Sales_price	Market_description	Destination
157	Windy #3	--	Specialty uses, benches, table tops, coasters, tile, facing, veneer	Truck to St George
158	Harrisburg-Picture Spring 1,2	--	Thirsty Stone products, see website	--
159	Honey Onyx	--	--	--
160	Huff Creek	--	--	--
161	Aragonite Mine	--	--	--
162	Nine Mile (Bown State lease)	--	--	--
163	B & W #1 claims	--	--	--
164	Little Creek Picture Sandstone	--	--	--
165	Wonder #2	--	--	--
166	Lynn School Quarry (DOGM's Lynn Pass)	--	--	--
167	Allen Claims	--	--	--
168	Cobble/Sandstone (State lease 47950)	--	--	--
169	Moenkopi Hite quarry	--	--	--
170	Mystery - ML 45848	--	--	--
171	Indian Queen	--	--	--
172	Briggs Quarry	--	--	--
173	Glen Goff Property	--	--	--
174	Bald Knoll	--	--	--
175	Carol Mine	--	--	--
176	Rapunzel	--	--	--
177	Henrietta (Black Hills)	--	--	--
178	Red Chief	--	--	--
179	Snow White	--	--	--
180	Martin-Brown/Wilford #2	--	--	--
181	Amis #1	--	--	--
182	Italian Tan	--	--	--
183	ML 43854 & ML 982	--	--	--
184	Strawberry River	--	--	--
185	Wah Wah Red	--	--	--

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Prod_1995	Prod_1996	Prod_1997	Prod_1998	Prod_1999	Prod_2000	Prod_2001	Prod_2002	Prod_2003	Prod_2004	Max_prod
157	Windy #3								100	200	150	200
158	Harrisburg-Picture Spring 1,2				0	0	376	0	0	0	0	376
159	Honey Onyx			12	18	12	55	0	50	5	NR	55
160	Huff Creek				0	56	0	0	0	0	0	56
161	Aragonite Mine		3	200	3	3	20	20	20	1	1	20
162	Nine Mile (Bown State lease)				185	1000	800	205	400	400	286	1000
163	B & W #1 claims				NR	NR	NR	NR	NR	NR	NR	
164	Little Creek Picture Sandstone				1384	2915	4663	3040	6332	0	3116	6332
165	Wonder #2		750	408	371	289	129	47	45	100	7	371
166	Lynn School Quarry (DOGM's Lynn Pass)			NR	1200	1100	3000	3000	3000	3000	3000	3000
167	Allen Claims			26	26	15	13	0	0	85	0	85
168	Cobble/Sandstone (State lease 47950)		Confid.	Confid.	Confid.	Confid.	Confid.	Confid.	Confid.	Confid.	Confid.	Confid.
169	Moenkopi Hite quarry			0	0	0	0	0	0	0	0	
170	Mystery - ML 45848			1	0	0.5	1	1	0.25	1	1	1
171	Indian Queen		4412	6500	6380	11000	6400	8773	7634	NR	NR	11000
172	Briggs Quarry				0	NR	3594	1947	NR	NR	NR	3594
173	Glen Goff Property			NR	NR	NR	10	50	50	121	116	121
174	Bald Knoll		0	NR	NR	2800	0	NR	2110	NR	NR	2800
175	Carol Mine									20	0	20
176	Rapunzel									NR	NR	
177	Henrietta (Black Hills)		0	0	7	2	0	0	0	0	16	16
178	Red Chief					0	0	0	0	Confid.	0	Confid.
179	Snow White					0	207	0	0	NR	0	207
180	Martin-Brown/Wilford #2								350	NR	0	350
181	Amis #1								600	NR	203	600
182	Italian Tan										0	
183	ML 43854 & ML 982		340	302	333	70	288	250	307	397	397	397
184	Strawberry River								NR	2921	NR	2921
185	Wah Wah Red										0	

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Comments
157	Windy #3	Startup in 2002
158	Harrisburg-Picture Spring 1,2	--
159	Honey Onyx	--
160	Huff Creek	Closed in 2000
161	Aragonite Mine	
162	Nine Mile (Bown State lease)	Landowner, Joe Frischknecht SITLA production data here is CONFIDENTIAL
163	B & W #1 claims	No production records
164	Little Creek Picture Sandstone	Expect 4000 t in 2004
165	Wonder #2	--
166	Lynn School Quarry (DOGM's Lynn Pass)	Landowner: Picket Ranch
167	Allen Claims	--
168	Cobble/Sandstone (State lease 47950)	SITLA production data here is CONFIDENTIAL
169	Moenkopi Hite quarry	--
170	Mystery - ML 45848	--
171	Indian Queen	In tons
172	Briggs Quarry	Landowner: Picket Ranch
173	Glen Goff Property	--
174	Bald Knoll	--
175	Carol Mine	--
176	Rapunzel	--
177	Henrietta (Black Hills)	--
178	Red Chief	Opened in 1999 SITLA production data here is CONFIDENTIAL
179	Snow White	Opened 1999
180	Martin-Brown/Wilford #2	Opened in 2001
181	Amis #1	Opened in 2002
182	Italian Tan	Proposed
183	ML 43854 & ML 982	Additional location, 22 S 6 E 35 e2e2
184	Strawberry River	Opened in 2001
185	Wah Wah Red	Proposed at 6000 tpy

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Alt_Name	Location_State	Surface_Mgmt	Case_Type	Visited	Photos	Sampled	Date_Visit	Status
186	Picture Rock/San Juan Rainbow #1	San Juan Rainbow #1	UT	Unknown	Unknown	No	No	No	--	Active
187	Courgraph	--	UT	State of Utah lease	State of Utah lease	No	No	No	--	Inactive
188	Green Beetle	--	UT	Salt Lake FO	Unknown	No	No	No	--	Active
189	Skyline Pine quarry	--	UT	Salt Lake FO	Private	Yes	No	No	--	Active
190	Travertine Cove #2, 3, 4	--	UT	Unknown	Unknown	No	No	No	--	Inactive
191	B & C Limestone	--	UT	State of Utah lease	State of Utah lease	No	No	No	--	Active
192	Dove Gray quarry	--	UT	Private	Private	No	No	No	--	Active
193	Brown's Canyon Rock quarry	--	UT	Private	Private	No	No	No	--	Active
194	Park City Stone Mill	--	UT	Private	Private	No	No	No	--	Past producer
195	Ebony and Ivory #1	--	UT	Fillmore FO	Material site	No	No	No	--	Past producer
196	3 Guys Rock and Gem #1	--	UT	Unknown	Unknown	No	No	No	--	Past producer
197	Cream Time (Young/Bryce Haas state lease)	Young/Bryce Haas State of Utah Lease	UT	State of Utah lease	State of Utah lease	No	No	No	--	Past producer
198	Torrey Buff	--	UT	State of Utah lease	State of Utah lease	No	No	No	--	Active
199	Peoa Blonde quarry	--	UT	Private	Private	No	No	No	--	Active
200	Heber quarry	--	UT	Private	Private	No	No	No	--	Active
201	Horse Creek	--	UT	Salt Lake FO	Claims	No	No	No	--	Inactive
202	Santa Barbara quarry	--	UT	Unknown	Unknown	No	No	No	--	Past producer
203	ML 48572-MP	--	UT	State of Utah lease	State of Utah lease	No	No	No	--	Past producer
204	Levin Stone	--	UT	Unknown	Unknown	No	No	No	--	Inactive
205	Rocanville/Wing JV Marjum	--	UT	Fillmore FO	Claims	No	No	No	--	Active
206	Ruby Red - Wheeler #3	--	UT	Unknown	Unknown	No	No	No	--	Active
207	Cloudy Moon quarry (state lease)	--	UT	State of Utah lease	State of Utah lease	No	No	No	--	Active
208	Red Sandstone	--	UT	Unknown	Unknown	No	No	No	--	Active
209	Dog Valley #1 & #2	--	UT	Fillmore FO	Claims	No	No	No	--	Past producer
210	Heber Red	--	UT	Private	Private	No	No	No	--	Active
211	Little Indian Mine (state lease)	--	UT	State of Utah lease	State of Utah lease	No	No	No	--	Active
212	Southern White/Mountain Rose	--	UT	Unknown	Unknown	No	No	No	--	Active
213	Keystone Ridge & Mammoth	--	UT	Unknown	Unknown	No	No	No	--	Inactive

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Map_Name	Type_Site	Claim_Name	BLM_Case	SubTerra_Number	UT_DOGM_ID
186	Picture Rock/San Juan Rainbow #1	Blanding 100k	Quarry	--	--	s370099	s370099
187	Courgraph	Wah Wah Mtns. South 100 k	Quarry	--	--	s010018	s010018
188	Green Beetle	Grouse Creek 100k	Quarry	--	--	s030017	s030017
189	Skyline Pine quarry	Grouse Creek 100k	Quarry	--	--	s030040	s030040
190	Travertine Cove #2, 3, 4	Richfield 100K	Quarry	--	--	s270061	s270061
191	B & C Limestone	Manti 100k	Quarry	--	--	m390013	m390013
192	Dove Gray quarry	Price 100 k	Quarry	--	--		s490039
193	Brown's Canyon Rock quarry	Salt Lake City 100 k	Quarry	--	--	m430021	m430021
194	Park City Stone Mill	Salt Lake City 100 k	Quarry	--	--	m430022	m430022
195	Ebony and Ivory #1	Wah Wah Mtns. North 100 k	Quarry	--	UTU 072854	s270057	s270057
196	3 Guys Rock and Gem #1	Richfield 100K	Quarry	--	--	s270081	s270081
197	Cream Time (Young/Bryce Haas state lease)	Manti 100k	Quarry	--	--	s390009; s390003	s390003
198	Torrey Buff	Loa 100K	Quarry	--	--	s550012	s550012
199	Peoa Blonde quarry	Salt Lake City 100 k	Quarry	--	UTU 077786	m430012	m430012
200	Heber quarry	Salt Lake City 100 k	Quarry	--	--	m510001	m510001
201	Horse Creek	Price 100 k	Quarry	American Stone 301	UTU 077018, UTU 077048	s490034	s490034
202	Santa Barbara quarry	Salt Lake City 100 k	Quarry	--	--	s130006	s130006
203	ML 48572-MP	St George 100k	Quarry	--	--		s530063
204	Levin Stone	Tule Valley	Quarry	--	UTU 078278	s270086	s270086
205	Rocanville/Wing JV Marjum	Tule Valley	Quarry	--	--		s270090
206	Ruby Red - Wheeler #3	Tule Valley	Quarry	--	--	s270068	s270068
207	Cloudy Moon quarry (state lease)	Bluff 100k	Quarry	--	--	s370116	s370116
208	Red Sandstone	St George 100k	Quarry	--	--		s530073
209	Dog Valley #1 & #2	Nephi 100 k	Quarry	--	UTU 79836	s230079	s230079
210	Heber Red	Salt Lake City 100 k	Quarry	--	--	s510003	s510003
211	Little Indian Mine (state lease)	La Sal 100 k	Quarry	--	--	--	s370117
212	Southern White/Mountain Rose	Wah Wah Mtns. South 100 k	Quarry	--	--	--	s010047
213	Keystone Ridge & Mammoth	Lynndyl 100K	Quarry	--	--	--	s230085

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IDNo	Name	UT_SITLA_ID	Data_Source	Operator_Name
186	Picture Rock/San Juan Rainbow #1	--	UT DOGM files; SubTerra (2004)	Shumway, Chris
187	Courgraph	46520, 45730	UT DOGM files, SubTerra (2004); John Blake Utah SITLA	Truman, Howard
188	Green Beetle	--	Mike Ford, SLFO; UT DOGM files; SubTerra (2004)	Bonneville quarries, Bill Bown owner
189	Skyline Pine quarry	--	Mike Ford, SLFO; UT DOGM files; SubTerra (2004)	Ward, Roscoe or Joyce
190	Travertine Cove #2, 3, 4	--	UT DOGM files	Burningham, Gary
191	B & C Limestone	48949	UT DOGM files, SubTerra (2004); John Blake Utah SITLA	Haas, Bryce
192	Dove Gray quarry	--	Mike Ford, SLFO; UT DOGM files	Haas, Bryce
193	Brown's Canyon Rock quarry	--	Mike Ford, SLFO; Lynn Kunzler; UT DOGM files; SubTerra (2004)	BMW Stone, Mark Willes
194	Park City Stone Mill	--	Mike Ford, SLFO; UT DOGM files; SubTerra (2004)	Park City Stone Paul Trunnell
195	Ebony and Ivory #1	--	UT DOGM files; SubTerra (2004)	Roberts, Jack
196	3 Guys Rock and Gem #1	--	UT DOGM files	Roberts, Jack
197	Cream Time (Young/Bryce Haas state lease)	ML 43391	UT DOGM files, SubTerra (2004); John Blake Utah SITLA	Young, Jon
198	Torrey Buff	45409	UT DOGM files, SubTerra (2004); John Blake Utah SITLA	Young, Jon
199	Peoa Blonde quarry	--	UT DOGM files; SubTerra (2004)	American Stone, Lon Thomas
200	Heber quarry	--	UT DOGM files; SubTerra (2004)	American Stone, Lon Thomas
201	Horse Creek	--	Mike Ford, SLFO; UT DOGM files; SubTerra (2004)	American Stone, Lon Thomas
202	Santa Barbara quarry	--	UT DOGM files; SubTerra (2004)	American Stone, Lon Thomas
203	ML 48572-MP	ML 48572 MP	UT DOGM files; John Blake Utah SITLA	Pulsipher, Dell, Levin Stone
204	Levin Stone	--	UT DOGM files, SubTerra (2004)	Levin Stone, Van Falls
205	Rocanville/Wing JV Marjum	--	UT DOGM files	Hamilton, Mert, Rocanville Stone
206	Ruby Red - Wheeler #3	--	UT DOGM files, SubTerra (2004)	Ruby Red Mining Co LLC, Jean Smith
207	Cloudy Moon quarry (state lease)	ML 48768	UT DOGM files, SubTerra (2004); John Blake Utah SITLA	Murphy, Sean, Moon Mountain Stone
208	Red Sandstone	--	UT DOGM files	Stout, Ron
209	Dog Valley #1 & #2	--	UT DOGM files, SubTerra (2004)	Woodward, Richard
210	Heber Red	--	Mike Ford, SLFO; UT DOGM files; SubTerra (2004)	Fitzgerald, Paul, Contractor
211	Little Indian Mine (state lease)	ML 49109 MP	UT DOGM files; John Blake Utah SITLA	H & H Stone Co., Fred Holley
212	Southern White/Mountain Rose	--	UT DOGM files	Applegate, Gary, Indian Queen Marble LLC
213	Keystone Ridge & Mammoth	--	UT DOGM files	Anderson Engineering, Steven Anderson

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Operator_Address	Operator_State	Operator_Tele	Location_Descr
186	Picture Rock/San Juan Rainbow #1	1025 S 200 E 95-15 Blanding UT 84511	UT	435-678-2909	--
187	Courgraph	389 W 100 S PO Box 443 Enterprise UT	UT	435-878-2638	--
188	Green Beetle	842 W 400 N W. Bountiful, UT 84087	UT	801-295-0601	In vicinity of Rosebud Ranch
189	Skyline Pine quarry	PO Box 108 EY Ranch Almo, ID 83312	ID	208-824-5591	2 mi S of Lynn Pass
190	Travertine Cove #2, 3, 4	BEG Resources 95 N 200 E PO Box 974 American Fork UT	UT	801-756-8138	--
191	B & C Limestone	331 E 200 S Lindon UT 84042	UT	801-796-6214	--
192	Dove Gray quarry	331 E 200 S Lindon UT 84042	UT	801-796-6214	--
193	Brown's Canyon Rock quarry	2526 State Rd 32 Wanship UT	UT	801-573-0562	10 mi E of Park City UT
194	Park City Stone Mill	PO Box 40 Clark Fork ID 83811	ID	208-661-5079, 266-1789	--
195	Ebony and Ivory #1	340 S Main St PO Box 356 Fillmore UT 84631	UT	435-864-7865	Red Wash area
196	3 Guys Rock and Gem #1	340 S Main St PO Box 356 Fillmore UT 84631	UT	435-864-7865	--
197	Cream Time (Young/Bryce Haas state lease)	2402 Broadview Ct Sandy UT 84092	UT	801-571-6558	--
198	Torrey Buff	2402 Broadview Ct Sandy UT 84092	UT	801-571-6558	Located 0.5 mi N. of BLM's community pit
199	Peoa Blonde quarry	Salt Lake City UT	UT	801-262-4300 Roger	--
200	Heber quarry	Salt Lake City UT	UT	801-262-4300 Roger	--
201	Horse Creek	Salt Lake City UT	UT	801-262-4300 Roger	--
202	Santa Barbara quarry	Salt Lake City UT	UT	801-262-4300 Roger	--
203	ML 48572-MP	1016 E Summit Ridge Dr St George UT 84790	UT	435-628-9288	--
204	Levin Stone	Box 95 Ash Fork, AZ 86320	AZ	520-637-2288	--
205	Rocanville/Wing JV Marjum	PO Box 35 Delta UT 84624	UT	435-864-5242	--
206	Ruby Red - Wheeler #3	65 S 500 W Delta, UT 84624	UT	435-864-2806	--
207	Cloudy Moon quarry (state lease)	833 N Grayson Pkwy3-2 Blanding UT 84511	UT	435-678-3137	--
208	Red Sandstone	900 Industrial Rd PO Box 251 St George UT 84770	UT	435-673-6662	--
209	Dog Valley #1 & #2	PO Box 394 Nephi UT 84648	UT	435-650-1337	--
210	Heber Red	1123 E 7625 S Midvale, UT 84047	UT	801-255-7809	--
211	Little Indian Mine (state lease)	PO Box 250 Dove Creek, CO 81324	UT	970-677-2767	--
212	Southern White/Mountain Rose	PO Box 668 Tooele, UT 84074	UT	435-387-5117	--
213	Keystone Ridge & Mammoth	977 W 2100 S Salt Lake City UT	UT	801-972-6222	--

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IDNo	Name	Location_County	Tp	Rg	Sec&Sub	Lat_dd	Long_dd	UTM_E	UTM_N	UTM_Zone	Coll_Method
186	Picture Rock/San Juan Rainbow #1	San Juan	38 S	24 E	3 sw, 4 se	37.5068	-109.2722	652715	4152503	12S	Copy from SubTerra
187	Courgraph	Beaver	30 S	14 W	36 nwsw, swsw	38.1568	-113.3763	291834	4225215	12S	Copy from SubTerra
188	Green Beetle	Box Elder	11 N	16 W	36 sese	41.6264	-113.6192	281808	4611610	12T	Read from ArcMap
189	Skyline Pine quarry	Box Elder	13 N	17 W	35 sene, nese	41.8058	-113.7580	270886	4631887	12T	Read from ArcMap
190	Travertine Cove #2, 3, 4	Millard	25 S	7 W	5 senw	38.6654	-112.6672	354951	4280970	12S	Copy from SubTerra
191	B & C Limestone	Sanpete	18 S	1 E	32 swsw	39.1928	-111.8306	428272	4338504	12S	Copy from SubTerra
192	Dove Gray quarry	Utah	11 S	9 E	33 swne, nwne	39.8227	-110.9219	506688	4408086	12S	Read from ArcMap
193	Brown's Canyon Rock quarry	Summit	1 S	5 E	21 senw, nwsw	40.7175	-111.3941	466714	4507467	12T	Read from ArcMap
194	Park City Stone Mill	Summit	1 S	5 E	21 swnw, nwnw	40.7160	-111.3942	466704	4507311	12T	Read from ArcMap
195	Ebony and Ivory #1	Millard	23 S	13 W	15	38.8129	-113.2990	300393	4298515	12S	Copy from SubTerra
196	3 Guys Rock and Gem #1	Millard	23 S	8 W	28 swne	38.7839	-112.7561	347470	4294261	12S	Calculated from trs
197	Cream Time (Young/Bryce Haas state lease)	Sanpete	19 S	2 E	16 nenw	39.1692	-111.7001	439521	4335787	12S	Calculated from trs
198	Torrey Buff	Wayne	29 S	2 E	16 nwnwsw	38.2899	-111.6982	467161	4237594	12S	Copy from SubTerra
199	Peoa Blonde quarry	Summit	1 S	5 E	20 nesw, senw	40.7160	-111.4073	465602	4507311	12T	Read from ArcMap
200	Heber quarry	Wasatch	4 S	6 E	6 sesw, swse	40.4948	-111.3110	473648	4482725	12T	Read from ArcMap
201	Horse Creek	Utah	11 S	9 E	35 nwsw	39.8162	-110.8925	509205	4407362	12S	Read from ArcMap
202	Santa Barbara quarry	Wasatch	3 S	6 E	36 swne, nwne	40.1777	-110.5171	541117	4447596	12T	Copy from SubTerra
203	ML 48572-MP	Washington	43 S	15 W	15 sesw	37.0484	-113.5226	275637	4101914	12S	Copy from SubTerra
204	Levin Stone	Millard	18 S	13 W	4, 3 se	39.2795	-113.3025	301400	4350317	12S	Copy from SubTerra
205	Rocanville/Wing JV Marjum	Millard	17 S	13 W	34 nenw	39.2860	-113.3015	301503	4351040	12S	Calculated from trs
206	Ruby Red - Wheeler #3	Millard	17 S	13 W	35 nene	39.2886	-113.2777	303566	4351274	12S	Copy from SubTerra
207	Cloudy Moon quarry (state lease)	San Juan	38 S	24 E	16 swnw	37.4831	-109.2923	650986	4149837	12S	Copy from SubTerra
208	Red Sandstone	Washington	42 S	15 W	20 nenw	37.1208	-113.5595	272605	4111340	12S	Calculated from trs
209	Dog Valley #1 & #2	Juab	13 S	2 W	25 nesw	39.6511	-111.9931	414800	4389500	12S	Calculated from trs
210	Heber Red	Wasatch	4 S	6 E	6 sese	40.4943	-111.3042	474222	4482664	12T	Read from ArcMap
211	Little Indian Mine (state lease)	San Juan	31 S	26 E	32 nene	38.0402	-109.0907	667547	4211995	12S	Calculated from trs
212	Southern White/Mountain Rose	Beaver	27 S	13 W	15 s2sw	38.4638	-113.3018	299175	4259786	12S	Calculated from trs
213	Keystone Ridge & Mammoth	Juab	10 S	3 W	25 nwsw, 13 swne, nwse	39.9223	-112.1244	403911	4419738	12S	Calculated from trs

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IDNo	Name	Color	Geology	Generalized_Rock_Unit
186	Picture Rock/San Juan Rainbow #1	--	Dakota Sandstone	Dakota
187	Courgraph	--	--	--
188	Green Beetle	--	Eureka Quartzite (Ordo.)	Eureka_Ordo
189	Skyline Pine quarry	Gray	Elba Quartzite (pC)	ElbaQtz_pC
190	Travertine Cove #2, 3, 4	--	--	--
191	B & C Limestone	--	--	--
192	Dove Gray quarry	--	Colton Formation	Colton
193	Brown's Canyon Rock quarry	--	Nugget Sandstone	Nugget
194	Park City Stone Mill	--	Nugget Sandstone	Nugget
195	Ebony and Ivory #1	Black-White	--	--
196	3 Guys Rock and Gem #1	--	--	--
197	Cream Time (Young/Bryce Haas state lease)	Light brown	Green River Formation (Eocene)	GreenRiver
198	Torrey Buff	Reddish brown	Moenkopi Formation	Moenkopi
199	Peoa Blonde quarry	--	Nugget Sandstone	Nugget
200	Heber quarry	Reddish brown	Navajo Sandstone	Navajo
201	Horse Creek	--	Colton Formation	Colton
202	Santa Barbara quarry	--	--	--
203	ML 48572-MP	--	--	--
204	Levin Stone	--	Marjum Form. (Cambrian)	Marjum
205	Rocanville/Wing JV Marjum	Reddish brown	Marjum Form. (Cambrian)	Marjum
206	Ruby Red - Wheeler #3	Grayish red	--	--
207	Cloudy Moon quarry (state lease)	--	Dakota Sandstone	Dakota
208	Red Sandstone	--	--	--
209	Dog Valley #1 & #2	--	--	--
210	Heber Red	--	Navajo Sandstone	Navajo
211	Little Indian Mine (state lease)	--	--	--
212	Southern White/Mountain Rose	--	--	--
213	Keystone Ridge & Mammoth	--	--	--

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Lithologic_Description	Generalized_Lithology
186	Picture Rock/San Juan Rainbow #1	Sandstone	Sandstone
187	Courgraph	Limestone	Limestone
188	Green Beetle	Quartzite	Quartzite
189	Skyline Pine quarry	Quartzite, hard, vitreous, micaceous, partings into thin sheets	Quartzite
190	Travertine Cove #2, 3, 4	Limestone, travertine	Limestone
191	B & C Limestone	Limestone block	Limestone
192	Dove Gray quarry	Blocks, boulders, large, of sandstone landscape rock	Sandstone
193	Brown's Canyon Rock quarry	Sandstone	Sandstone
194	Park City Stone Mill	Sandstone, flaggy	Sandstone
195	Ebony and Ivory #1	Limestone, hydrothermally altered and recystallized organic, color striping(Zebra marble)	Limestone
196	3 Guys Rock and Gem #1	Volcanic rock, aquarium rock	Volcanic
197	Cream Time (Young/Bryce Haas state lease)	Limestone, sandy, flaggy, light grown to buff in color	Limestone
198	Torrey Buff	Sandstone	Sandstone
199	Peoa Blonde quarry	Sandstone	Sandstone
200	Heber quarry	Sandstone, uniform fine grained, red and quartzose	Sandstone
201	Horse Creek	Sandstone	Sandstone
202	Santa Barbara quarry	Sandstone	Sandstone
203	ML 48572-MP	--	--
204	Levin Stone	Shale, fissile, dissaggregates with weathering	Shale
205	Rocanville/Wing JV Marjum	--	Sandstone
206	Ruby Red - Wheeler #3	Limestone, catlinite (?), pipestone, deep reds grayish-purple with yellow, red, and purple banding	Limestone
207	Cloudy Moon quarry (state lease)	Sandstone	Sandstone
208	Red Sandstone	Sandstone, crushed, aggregate	Sandstone
209	Dog Valley #1 & #2	--	--
210	Heber Red	Sandstone	Sandstone
211	Little Indian Mine (state lease)	Sandstone	Sandstone
212	Southern White/Mountain Rose	Marble, limestone	Marble
213	Keystone Ridge & Mammoth	--	--

IDNo	Name	Other_characteristics	Extraction_Fractures_Cleavability	Product_Dimension_Fractures_Cleavability
186	Picture Rock/San Juan Rainbow #1	--	Favorable with respect to extraction	Favorable with respect to product dimensions.
187	Courgraph	--	--	--
188	Green Beetle	--	Favorable with respect to extraction	Favorable with respect to product dimensions.
189	Skyline Pine quarry	--	Favorable with respect to extraction	Unfavorable with respect to product dimensions
190	Travertine Cove #2, 3, 4	--	Not Applicable.	--
191	B & C Limestone	--	Favorable with respect to extraction	Favorable with respect to product dimensions.
192	Dove Gray quarry	--	--	--
193	Brown's Canyon Rock quarry	--	--	--
194	Park City Stone Mill	--	--	--
195	Ebony and Ivory #1	Zebra striping on rock	Not Applicable.	--
196	3 Guys Rock and Gem #1	--	Not Applicable.	--
197	Cream Time (Young/Bryce Haas state lease)	--	--	--
198	Torrey Buff	--	--	--
199	Peoa Blonde quarry	--	--	--
200	Heber quarry	--	Favorable with respect to extraction	Favorable with respect to product dimensions.
201	Horse Creek	--	--	--
202	Santa Barbara quarry	--	--	--
203	ML 48572-MP	--	--	--
204	Levin Stone	--	--	--
205	Rocanville/Wing JV Marjum	--	Favorable with respect to extraction	Favorable with respect to product dimensions.
206	Ruby Red - Wheeler #3	--	Favorable with respect to extraction	Favorable with respect to product dimensions.
207	Cloudy Moon quarry (state lease)	--	Favorable with respect to extraction	Favorable with respect to product dimensions.
208	Red Sandstone	--	--	--
209	Dog Valley #1 & #2	--	--	--
210	Heber Red	--	--	--
211	Little Indian Mine (state lease)	--	--	--
212	Southern White/Mountain Rose	--	--	--
213	Keystone Ridge & Mammoth	--	--	--

IDNo	Name	Influence_of_Texture	Uniform_Thickness	Lithology_Hardness_Durability	Rock_Quality_Suitability
186	Picture Rock/San Juan Rainbow #1	Likely influence	Yes	Advantageous	--
187	Courgraph	--	--	--	--
188	Green Beetle	--	--	--	Fissile, hard, suitable for flagstone
189	Skyline Pine quarry	No Influence	Yes	Advantageous	Fair to good quality
190	Travertine Cove #2, 3, 4	Likely influence	No	Moderately Advantageous	Unknown
191	B & C Limestone	No Influence	Yes	Advantageous	--
192	Dove Gray quarry				--
193	Brown's Canyon Rock quarry	No Influence	Yes	Advantageous	--
194	Park City Stone Mill	--	--	--	--
195	Ebony and Ivory #1	No Influence	No	Advantageous	Durable for landscape uses
196	3 Guys Rock and Gem #1	Likely influence	No	Moderately Advantageous	
197	Cream Time (Young/Bryce Haas state lease)	--	--	--	Unknown
198	Torrey Buff	--	--	--	
199	Peoa Blonde quarry	No Influence	Yes	Advantageous	Readily cleaves into moderately durable flagstone
200	Heber quarry	No Influence	Yes	Advantageous	--
201	Horse Creek	--	--	--	--
202	Santa Barbara quarry	--	--	--	--
203	ML 48572-MP	--	--	--	--
204	Levin Stone	--	--	--	--
205	Rocanville/Wing JV Marjum	No Influence	Yes	Moderately Advantageous	Moderate durability for flagstone
206	Ruby Red - Wheeler #3	No Influence	No	Moderately Advantageous	
207	Cloudy Moon quarry (state lease)	Likely influence	Yes	Advantageous	Moderate to good durability for Flagstone
208	Red Sandstone	--	--	--	--
209	Dog Valley #1 & #2	--	--	--	--
210	Heber Red	--	--	--	--
211	Little Indian Mine (state lease)	--	--	--	--
212	Southern White/Mountain Rose	--	--	--	--
213	Keystone Ridge & Mammoth	--	--	--	--

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Size	Ease_of_Extraction	Extent_of_Deposit	Reserve_Limits_Overburden
186	Picture Rock/San Juan Rainbow #1	Medium	Moderately difficult (blasting likely required, or extraction otherwise made difficult through extensive overburden, unfavorable structure, etc.)	Limited or Confined	Limited due to thinness of favorable horizon
187	Courgraph	Medium	--	--	--
188	Green Beetle	Medium	--	--	Limited, discontinuous minable areas
189	Skyline Pine quarry	Medium	Moderately easy (extraction by ripping)	Surficial	Few thousand tons
190	Travertine Cove #2, 3, 4	Small	Moderately Easy (extraction by ripping)	Surficial	Unknown
191	B & C Limestone	Medium	Moderately difficult (blasting likely required, or extraction otherwise made difficult through extensive overburden, unfavorable structure, etc.)	Extended	Extensive > 10 year reserve
192	Dove Gray quarry	Small	--		--
193	Brown's Canyon Rock quarry	Large	--	Extended	--
194	Park City Stone Mill	Small	--		--
195	Ebony and Ivory #1	Small	Difficult (blasting required under confined or otherwise difficult conditions).	Limited or Confined	Unknown
196	3 Guys Rock and Gem #1	Medium	Moderately Easy (extraction by ripping)	Extended	Surface deposit - limited
197	Cream Time (Young/Bryce Haas state lease)	Medium	--	--	Unknown
198	Torrey Buff	Medium	--	--	--
199	Peoa Blonde quarry	Large	--	Extended	Extensive > 10 year reserve - limited overburden
200	Heber quarry	Large	Moderately difficult (blasting likely required, or extraction otherwise made difficult through extensive overburden, unfavorable structure, etc.)	Extended	Extensive > 10 year reserve
201	Horse Creek	Small	--	--	--
202	Santa Barbara quarry	Small	--	--	--
203	ML 48572-MP	Medium	--	--	--
204	Levin Stone	Small	--	--	--
205	Rocanville/Wing JV Marjum	Medium	Moderately Easy (extraction by ripping)	Extended	--
206	Ruby Red - Wheeler #3	Small	Moderately difficult (blasting likely required, or extraction otherwise made difficult through extensive overburden, unfavorable structure, etc.)	Limited or Confined	--
207	Cloudy Moon quarry (state lease)	Small	Moderately Easy (extraction by ripping)	Surficial	Limited by thin mine horizon
208	Red Sandstone	Medium	--	--	--
209	Dog Valley #1 & #2	Small	--	--	--
210	Heber Red	Medium	--	--	--
211	Little Indian Mine (state lease)	Medium	--	--	--
212	Southern White/Mountain Rose	Small	--	--	--
213	Keystone Ridge & Mammoth	Small	--	--	--

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IDNo	Name	Number_Products	Known_Products	Acres	Mining_Method	Hand_Methods
186	Picture Rock/San Juan Rainbow #1	Medium (3-5 products)	Flagstone, building stone	--	Hand-mechanized combined	Hand split, sort
187	Courgraph	--	--	--	--	--
188	Green Beetle		Flagstone	--	Hand-mechanized combined	Hand split, sort
189	Skyline Pine quarry	Small (1 - 2 products)	Flagstone; random slabs	--	Hand only	Surface collection
190	Travertine Cove #2, 3, 4	Small (1 - 2 products)	Landscape boulders	--	--	--
191	B & C Limestone	Large (>5 products)	Palleted block; 'Flagstone, building stone, ashlar	--	--	--
192	Dove Gray quarry			--	--	--
193	Brown's Canyon Rock quarry	Medium (3-5 products)	Splits to flagstone; removes many boulders also	--	Hand-mechanized combined	Hand split, sort
194	Park City Stone Mill		Decorative stone	--	Hand-mechanized combined	Hand split, sort
195	Ebony and Ivory #1	Small (1 - 2 products)	Landscape rock	--	--	--
196	3 Guys Rock and Gem #1	Small (1 - 2 products)	Aquarium rock	--	--	--
197	Cream Time (Young/Bryce Haas state lease)	--	Flaggy, limey sandstone	--	Hand-mechanized combined	Hand split, sort
198	Torrey Buff	--	--	--	--	--
199	Peoa Blonde quarry	Medium (3-5 products)	Flagstone / landscape rock	--	Hand-mechanized combined	Hand split, sort
200	Heber quarry	Medium (3-5 products)	Building stone	--	--	--
201	Horse Creek	--	Building stone	--	--	--
202	Santa Barbara quarry	--		--	--	--
203	ML 48572-MP	--	Landscape rock	--	--	--
204	Levin Stone	--	Building stone	--	--	--
205	Rocanville/Wing JV Marjum	Small (1 - 2 products)	Building stone, flagstone	--	Hand only	Hand split, sort
206	Ruby Red - Wheeler #3	Small (1 - 2 products)	--	--	--	--
207	Cloudy Moon quarry (state lease)	Medium (3-5 products)	Flagstone, landscape rock	--	Hand-mechanized combined	Hand split, sort
208	Red Sandstone	--	Sandstone aggregate	--	--	--
209	Dog Valley #1 & #2	--	Building stone, flagstone	--	--	--
210	Heber Red	--		--	--	--
211	Little Indian Mine (state lease)	--	Flagstone	--	--	--
212	Southern White/Mountain Rose	--	--	--	--	--
213	Keystone Ridge & Mammoth	--	--	--	--	--

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IDNo	Name	Mining_Description	Production_rate
186	Picture Rock/San Juan Rainbow #1	--	--
187	Courgraph	--	--
188	Green Beetle	--	Employee at yard says 6 semi trucks per year (May to July 23, 2004), 2.75 mos = 6 x 16 x 2 = 192 tons for part of season
189	Skyline Pine quarry	--	--
190	Travertine Cove #2, 3, 4	--	--
191	B & C Limestone	--	--
192	Dove Gray quarry	--	--
193	Brown's Canyon Rock quarry	--	--
194	Park City Stone Mill	--	--
195	Ebony and Ivory #1	--	--
196	3 Guys Rock and Gem #1	--	--
197	Cream Time (Young/Bryce Haas state lease)	--	--
198	Torrey Buff	--	--
199	Peoa Blonde quarry	--	--
200	Heber quarry	--	--
201	Horse Creek	--	--
202	Santa Barbara quarry	--	--
203	ML 48572-MP	--	--
204	Levin Stone	--	--
205	Rocanville/Wing JV Marjum	--	--
206	Ruby Red - Wheeler #3	--	--
207	Cloudy Moon quarry (state lease)	--	--
208	Red Sandstone	--	--
209	Dog Valley #1 & #2	--	--
210	Heber Red	--	--
211	Little Indian Mine (state lease)	--	--
212	Southern White/Mountain Rose	--	--
213	Keystone Ridge & Mammoth	Drill, blast, crush and screen	--

IDNo	Name	Processing_onsite	Work_schedule	Personnel	Buildings
186	Picture Rock/San Juan Rainbow #1	--	--	--	--
187	Courgraph	--	--	--	--
188	Green Beetle	--	--	--	--
189	Skyline Pine quarry	--	--	--	--
190	Travertine Cove #2, 3, 4	--	--	--	--
191	B & C Limestone	--	--	--	--
192	Dove Gray quarry	--	--	--	--
193	Brown's Canyon Rock quarry	Presume this rock is crushed	--	--	--
194	Park City Stone Mill	--	--	--	--
195	Ebony and Ivory #1	--	--	--	--
196	3 Guys Rock and Gem #1	--	--	--	--
197	Cream Time (Young/Bryce Haas state lease)	--	--	--	--
198	Torrey Buff	--	--	--	--
199	Peoa Blonde quarry	--	--	--	--
200	Heber quarry	--	--	--	--
201	Horse Creek	--	--	--	--
202	Santa Barbara quarry	--	--	--	--
203	ML 48572-MP	--	--	--	--
204	Levin Stone	--	--	--	--
205	Rocanville/Wing JV Marjum	--	--	--	--
206	Ruby Red - Wheeler #3	--	--	--	--
207	Cloudy Moon quarry (state lease)	--	--	--	--
208	Red Sandstone	--	--	--	--
209	Dog Valley #1 & #2	--	--	--	--
210	Heber Red	--	--	--	--
211	Little Indian Mine (state lease)	--	--	--	--
212	Southern White/Mountain Rose	--	--	--	--
213	Keystone Ridge & Mammoth	--	--	--	--

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Equipment	Product_inventory
186	Picture Rock/San Juan Rainbow #1	--	--
187	Courgraph	--	--
188	Green Beetle	--	--
189	Skyline Pine quarry	--	--
190	Travertine Cove #2, 3, 4	--	--
191	B & C Limestone	Backhoe, tumbler, generator, saw on site	--
192	Dove Gray quarry	--	--
193	Brown's Canyon Rock quarry	--	--
194	Park City Stone Mill	--	--
195	Ebony and Ivory #1	--	--
196	3 Guys Rock and Gem #1	--	--
197	Cream Time (Young/Bryce Haas state lease)	--	--
198	Torrey Buff	--	--
199	Peoa Blonde quarry	--	--
200	Heber quarry	--	--
201	Horse Creek	--	--
202	Santa Barbara quarry	--	--
203	ML 48572-MP	--	--
204	Levin Stone	--	--
205	Rocanville/Wing JV Marjum	--	--
206	Ruby Red - Wheeler #3	--	--
207	Cloudy Moon quarry (state lease)	--	--
208	Red Sandstone	--	--
209	Dog Valley #1 & #2	--	--
210	Heber Red	--	--
211	Little Indian Mine (state lease)	--	--
212	Southern White/Mountain Rose	--	--
213	Keystone Ridge & Mammoth	--	--

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Sales_price	Market_description	Destination
186	Picture Rock/San Juan Rainbow #1	--	--	--
187	Courgraph	--	--	--
188	Green Beetle	$375/pallet or $185/tons for 3/4"-1" (highest price of Bown operations)	--	--
189	Skyline Pine quarry	--	--	--
190	Travertine Cove #2, 3, 4	--	--	--
191	B & C Limestone	--	--	--
192	Dove Gray quarry	--	--	--
193	Brown's Canyon Rock quarry	--	--	--
194	Park City Stone Mill	--	--	--
195	Ebony and Ivory #1	--	--	--
196	3 Guys Rock and Gem #1	--	--	--
197	Cream Time (Young/Bryce Haas state lease)	--	--	--
198	Torrey Buff	--	--	--
199	Peoa Blonde quarry	--	--	--
200	Heber quarry	--	--	--
201	Horse Creek	--	--	--
202	Santa Barbara quarry	--	--	--
203	ML 48572-MP	--	--	--
204	Levin Stone	--	--	--
205	Rocanville/Wing JV Marjum	--	--	--
206	Ruby Red - Wheeler #3	--	--	--
207	Cloudy Moon quarry (state lease)	--	--	--
208	Red Sandstone	--	--	--
209	Dog Valley #1 & #2	--	--	--
210	Heber Red	--	--	--
211	Little Indian Mine (state lease)	--	--	--
212	Southern White/Mountain Rose	--	--	--
213	Keystone Ridge & Mammoth	--	--	--

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IDNo	Name	Prod_1995	Prod_1996	Prod_1997	Prod_1998	Prod_1999	Prod_2000	Prod_2001	Prod_2002	Prod_2003	Prod_2004	Max_prod
186	Picture Rock/San Juan Rainbow #1			0	0	100	500	NR	250	NR	0	500
187	Courgraph		3	0	583	884	1684	1713	286	0	0	1713
188	Green Beetle		100	172	300	408	302	238	0	350	750	750
189	Skyline Pine quarry			6	200	600	250	200	150	0	0	600
190	Travertine Cove #2, 3, 4					0	0	0	0	0	0	
191	B & C Limestone						0	NR	0	0	NR	
192	Dove Gray quarry								NR	NR	NR	
193	Brown's Canyon Rock quarry					15000	10000	10000	11000	15000	NR	15000
194	Park City Stone Mill					425	680	0	0.5	NR	0.5	680
195	Ebony and Ivory #1				0	0	0	0.25	0	NR	NR	0.25
196	3 Guys Rock and Gem #1						200	NR	0	NR	NR	200
197	Cream Time (Young/Bryce Haas state lease)	NR	NR	NR	Confid.	Confid.	Confid.	NR	NR	NR	NR	Confid.
198	Torrey Buff	300	NR	NR	NR	NR	16	NR	NR	NR	NR	16
199	Peoa Blonde quarry	3000	3000	3000	1500	2000	7845	4000	4000	4000	4000	7845
200	Heber quarry	2000	3000	1000	800	800	0	3000	3000	2000	2000	3000
201	Horse Creek				0	6	0	0	0	0	0	6
202	Santa Barbara quarry				NR	100	0	0	0	0	0	100
203	ML 48572-MP						40	200	NR	NR	NR	200
204	Levin Stone						0	0	0	NR	NR	
205	Rocanville/Wing JV Marjum						0	NR	NR	NR	0	
206	Ruby Red - Wheeler #3				35	38	50	24	NR	NR	NR	50
207	Cloudy Moon quarry (state lease)							5	23	12	NR	23
208	Red Sandstone								NR	919	NR	919
209	Dog Valley #1 & #2	NR	NR	NR	NR	NR	NR	NR	0	NR	NR	
210	Heber Red	NR	NR	NR	NR	1132	144	0	500	15	0	1132
211	Little Indian Mine (state lease)									354	Confid.	354
212	Southern White/Mountain Rose						NR	NR	NR	NR	NR	
213	Keystone Ridge & Mammoth									0	NR	

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IDNo	Name	Comments
186	Picture Rock/San Juan Rainbow #1	--
187	Courgraph	--
188	Green Beetle	--
189	Skyline Pine quarry	--
190	Travertine Cove #2, 3, 4	Opened in 2000
191	B & C Limestone	Opened in 2000; inventory of 180 pallets in yard in 1999; webstie bhstonesupply.com ID Nos. 191 and 218 appear as same property.
192	Dove Gray quarry	Opened in 2003 but mining in 2002 and before
193	Brown's Canyon Rock quarry	Units in cu yds
194	Park City Stone Mill	--
195	Ebony and Ivory #1	--
196	3 Guys Rock and Gem #1	Opened in 1999 60 topaz crystals
197	Cream Time (Young/Bryce Haas state lease)	SITLA production data here is CONFIDENTIAL
198	Torrey Buff	
199	Peoa Blonde quarry	1000 t in 1991; 1075 t in 1992; 1200 t in 1993; 1500 t in 1994
200	Heber quarry	--
201	Horse Creek	Opened in 1998
202	Santa Barbara quarry	Opened in 1998
203	ML 48572-MP	Opened in 2000
204	Levin Stone	Additional location, 18 S-13W-27sw Startup in 2000
205	Rocanville/Wing JV Marjum	--
206	Ruby Red - Wheeler #3	Opened in 1998
207	Cloudy Moon quarry (state lease)	Opened in 2001
208	Red Sandstone	Opened in 2002
209	Dog Valley #1 & #2	Opened in 2003
210	Heber Red	Opened in 1995
211	Little Indian Mine (state lease)	Opened in 2003 SITLA production data here is CONFIDENTIAL
212	Southern White/Mountain Rose	Opened in 1999
213	Keystone Ridge & Mammoth	Opened in 2003

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IDNo	Name	Alt_Name	Location_State	Surface_Mgmt	Case_Type	Visited	Photos	Sampled	Date_Visit	Status
214	R & W project	--	UT	Unknown	Unknown	No	No	No	--	Active
215	Kingston Canyon Rock	--	UT	Unknown	Unknown	No	No	No	--	Active
216	Michaud #1-#4	--	UT	St George FO/Private	Claims	No	No	No	--	Proposed
217	Lilim Claims	--	UT	Monticello FO	Claims	No	No	No	--	Past producer
218	Haas Limestone - Gunnison	--	UT	Unknown	Unknown	No	No	No	--	Active
219	Jon Young quarry (state lease ML48973)	State of Utah Lease ML 48973	UT	State of Utah lease	State of Utah lease	No	No	No	--	Active
220	United Stone (State lease ML 48322)	State of Utah Lease ML 48322	UT	State of Utah lease	State of Utah lease	No	No	No	--	Past producer
221	Lanny Jensen state lease	Danny Bown, operator	UT	State of Utah lease	State of Utah lease	No	No	No	--	Active
222	Ralph Simpson state lease	--	UT	State of Utah lease	State of Utah lease	No	No	No	--	Active
223	Reese Jenson state lease	--	UT	State of Utah lease	State of Utah lease	No	No	No	--	Past producer
224	Bryce Haas state lease-1	--	UT	State of Utah lease	State of Utah lease	No	No	No	--	Active
225	Bryce Haas state lease-2	--	UT	State of Utah lease	State of Utah lease	No	No	No	--	Active
226	Rocky Mountain Supply (retail)	--	ID	Idaho Falls FO	Private	Yes	Yes	No	Sept 1 2004	Active
227	Squires Brick (retail)	--	ID	Idaho Falls FO	Private	Yes	Yes	No	Sept 1 2004	Active
228	April Garden Center (retail)	--	WA	Private	Private	Yes	Yes	No	Sept 2 2004	Active
229	Northern Stone Supply (yard)	--	ID	Private	Private	Yes	Yes	No	July 1 2004	Active
230	Oakley Stone (yard)	--	ID	Private	Private	Yes	Yes	No	July 1 2004	Active
231	Cedar Landscape Supply (retail)	--	UT	Private	Private	Yes	Yes	No	May 12 2004	Active
232	3-H Landscaping Products (retail)	--	UT	Private	Private	Yes	Yes	No	June 17 2004	Active
233	Feller Stone (yard)	--	UT	Private	Private	Yes	Yes	No	June 17 2004	Active
234	Wal-Mart (retail)	--	UT	Private	Private	Yes	Yes	No	May 12 2004	Active
235	Rowland Stone (retail)	--	UT	Private	Private	Yes	Yes	No	June 17 2004	Active
236	Rocanville Stone (yard)	--	UT	Private	Private	Yes	Yes	No	Sept 16 2004	Active
237	Gold Star Stone (yard)	--	UT	Private	Private	Yes	Yes	No	July 22 2004	Active
238	American Stone (yard)	--	ID	Private	Private	Yes	Yes	No	July 22 2004	Active
239	Ace Hardware/Spring Creek Stone (retail)	--	ID	Private	Private	Yes	Yes	No	Aug 31 2004	Active
240	Park Valley (yard)	--	UT	Salt Lake FO	Yard-Mill site	Yes	No	No	July 12 2004	Active
241	Brown's Canyon (D. Wurth)	--	UT	Private	Private	No	No	No	--	Active
242	State Stone saw plant	--	UT	Private	Private	Yes	Yes	No	June 2 2004	Active

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Map_Name	Type_Site	Claim_Name	BLM_Case	SubTerra_Number	UT_DOGM_ID
214	R & W project	St George 100k	Quarry	--	--	--	s530074
215	Kingston Canyon Rock	Beaver 100 k	Quarry	--	--	--	s310009
216	Michaud #1-#4	St George 100k	Quarry	--	--	--	s530075
217	Lilim Claims	La Sal 100 k	Quarry	--	--	--	s370092
218	Haas Limestone - Gunnison	Manti 100k	Quarry	--	--	--	s390012
219	Jon Young quarry (state lease ML48973)	Loa 100K	Quarry	--	--	--	--
220	United Stone (State lease ML 48322)	Price 100 k	Quarry	--	--	--	--
221	Lanny Jensen state lease	Manti 100k	Quarry	--	--	--	s390009
222	Ralph Simpson state lease	Vernal 100 k	Quarry	--	--	--	s040078
223	Reese Jenson state lease	Seep Ridge 100 k	Quarry	--	--	--	--
224	Bryce Haas state lease-1	Manti 100k	Quarry	--	--	s390012	--
225	Bryce Haas state lease-2	Manti 100k	Quarry	--	--	--	--
226	Rocky Mountain Supply (retail)	Blackfoot 100k	Yard, retail	--	--	--	--
227	Squires Brick (retail)	Blackfoot 100k	Yard, retail	--	--	--	--
228	April Garden Center (retail)	Spokane WA 100K	Yard, retail	--	--	--	--
229	Northern Stone Supply (yard)	Oakley ID 100k	Yard	--	--	--	--
230	Oakley Stone (yard)	Oakley ID 100k	Yard	--	--	i020002	--
231	Cedar Landscape Supply (retail)	Cedar City 100 k	Yard, retail	--	--	--	--
232	3-H Landscaping Products (retail)	St George 100k	Yard, retail	--	--	--	--
233	Feller Stone (yard)	St George 100k	Yard, and basalt quarry	--	--	--	--
234	Wal-Mart (retail)	Cedar City 100 k	Yard, retail	--	--	--	--
235	Rowland Stone (retail)	St George 100k	Yard, retail	--	--	--	--
236	Rocanville Stone (yard)	Delta 100 k	Yard, retail	--	--	--	--
237	Gold Star Stone (yard)	Grouse Creek 100k	Yard	--	--	--	--
238	American Stone (yard)	Oakley ID 100k	Yard	--	--	--	--
239	Ace Hardware/Spring Creek Stone (retail)	Kootenai NF map east half	Yard, retail	--	--	--	--
240	Park Valley (yard)	Park Valley 7.5 min	Yard	Enterprise mill site	UTU 072297	UTU 072297	--
241	Brown's Canyon (D. Wurth)	Park City East 7.5-min	Quarry	--	--	m430017	m430017
242	State Stone saw plant	Loa 100K	Yard, plant	--	--	--	--

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	UT_SITLA_ID	Data_Source	Operator_Name
214	R & W project	--	UT DOGM files	R & W Inc., Willie Jessop
215	Kingston Canyon Rock	--	UT DOGM files	Beckstrom, Stan, Utah Div. of Wildlife Resources
216	Michaud #1-#4	--	UT DOGM files	Michaud, Patrick
217	Lilim Claims	--	UT DOGM files	Shumway, Chris
218	Haas Limestone - Gunnison	--	UT DOGM files	Haas, Bryce
219	Jon Young quarry (state lease ML48973)	ML 45409	John Blake Utah SITLA	Young, Jon
220	United Stone (State lease ML 48322)	ML 48322 OBA	John Blake Utah SITLA	United Stone PO Box 909 500 W 59 N Duchesne UT 84021 Justin Farley
221	Lanny Jensen state lease	ML 47868 MP	John Blake Utah SITLA	Bown, Danny
222	Ralph Simpson state lease	ML 49199 MP	John Blake Utah SITLA	Simpson, Ralph
223	Reese Jenson state lease	ML 48585 MP	John Blake Utah SITLA	Reese Jensen
224	Bryce Haas state lease-1	ML 48949OBA (ML 47244a & 47272a)	John Blake Utah SITLA; SubTerra (2004)	Haas, Bryce
225	Bryce Haas state lease-2	ML 48949 (ML48313MP)	John Blake Utah SITLA	Haas, Bryce
226	Rocky Mountain Supply (retail)	--	Steve	Rocky Mountain Supply
227	Squires Brick (retail)	--	Ryan	Squires Brick
228	April Garden Center (retail)	--	Darrel Fauser	April Garden Center
229	Northern Stone Supply (yard)	--	Garth Greenwell, quarry mgr.	Northern Stone Supply Co.
230	Oakley Stone (yard)	--	SubTerra (2004)	Oakley Stone Co
231	Cedar Landscape Supply (retail)	--	Craig Nelson	Cedar Landscape Supply
232	3-H Landscaping Products (retail)	--	Doug Holt	3-H Landscaping
233	Feller Stone (yard)	--	Russ Feller	A & R Leasing, Russ Feller
234	Wal-Mart (retail)	--	--	Wal-mart
235	Rowland Stone (retail)	--	office clerk	Rowland Stone
236	Rocanville Stone (yard)	--	Mert Hamilton, manager	Rocanville Stone Corp., Mert Hamilton
237	Gold Star Stone (yard)	--	Mike Ford, SLFO; Barry Peterson	Star Stone
238	American Stone (yard)	--	Lon Thomas	American Stone, Lon Thomas
239	Ace Hardware/Spring Creek Stone (retail)	--	Mark Heisel	Spring Creek Stone
240	Park Valley (yard)	--	Mike Ford, SLFO; SubTerra (2004)	Bonneville quarries, Bill Bown owner
241	Brown's Canyon (D. Wurth)	--	Mike Ford, Salt Lake FO, UT data from site visit; and Devlin Wurth, phone conversation 10-25-04; Lynn Kunzler, DOGM; SubTerra (2004); UT DOGM	Rock Products of Utah - Devlin Wurth
242	State Stone saw plant	--	Michael Jackson, Richfield FO	State Stone

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Operator_Address	Operator_State	Operator_Tele	Location_Descr
214	R & W project	1475 W Field Ave. PO Box 840830 Hildale, UT 84784	UT	435-874-1060	--
215	Kingston Canyon Rock	PO Box 606 Cedar City UT 84721	UT	435-865-6108	--
216	Michaud #1-#4	43663 Acacia Dr Palm Desert, CA 92260	UT	760-342-8343	--
217	Lilim Claims	4986 Spanish Valley Dr Moab, UT 84532	UT	435-259-0850	--
218	Haas Limestone - Gunnison	331 E 200 S Lindon UT 84042	UT	801-796-6214	--
219	Jon Young quarry (state lease ML48973)	2402 Broadview Ct Sandy UT 84092	UT	801-571-6558	--
220	United Stone (State lease ML 48322)	PO Box 909 Duchesne UT 84021	UT	435-738-2366, 822-5145 cell	--
221	Lanny Jensen state lease	595 E 600 S PO Box 27 Manti, UT 84642-0027	UT	435-835-7542	--
222	Ralph Simpson state lease	929 N 2500 W Vernal UT 84078	UT	435-789-5556	--
223	Reese Jenson state lease	HC 65 Box 190 Talmadge UT 84073	UT	435-454-3074	--
224	Bryce Haas state lease-1	331 E 200 S Lindon UT 84042	UT	435-528-5342	--
225	Bryce Haas state lease-2	331 E 200 S Lindon UT 84042	UT	435-528-5342	--
226	Rocky Mountain Supply (retail)	Idaho Falls	ID		--
227	Squires Brick (retail)	Idaho Falls	ID	208-523-7955	--
228	April Garden Center (retail)	Deer Park	WA	509-276-6997	--
229	Northern Stone Supply (yard)	Oakley, ID	ID	208-862-3353	--
230	Oakley Stone (yard)	Oakley, ID	ID	208-862-3450	--
231	Cedar Landscape Supply (retail)	Cedar City	UT		--
232	3-H Landscaping Products (retail)	St. George UT	UT	435-628-5522	--
233	Feller Stone (yard)	Veyo	UT	435-674-9300	1 mi east of Veyo, UT
234	Wal-Mart (retail)	Cedar City	UT		--
235	Rowland Stone (retail)	St. George UT	UT	435-673-2349	--
236	Rocanville Stone (yard)	Delta	UT	435-864-5242, 864-8987 cell	--
237	Gold Star Stone (yard)	--	--	--	--
238	American Stone (yard)	Lon Thomas 4040 S 300 W Salt Lake City UT 84107	UT	801-262-4300 Roger	--
239	Ace Hardware/Spring Creek Stone (retail)	PO Box 135 Hope ID	ID	208-264-5960	--
240	Park Valley (yard)	253 E 2200 S Bountiful UT 84010	UT		--
241	Brown's Canyon (D. Wurth)	832 Main St, Heber, UT 84032	UT	435-654-3978	10 mi E of Park City UT
242	State Stone saw plant	--	UT	--	--

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Location_County	Tp	Rg	Sec&Sub	Lat_dd	Long_dd	UTM_E	UTM_N	UTM_Zone	Coll_Method
214	R & W project	Washington	43 S	13 W	22 swne	37.0339	-113.3012	295324	4101109	12S	Calculated from trs
215	Kingston Canyon Rock	Piute	30 S	2.5 W	16 nwse	38.1964	-112.1231	401658	4228203	12S	Recorded
216	Michaud #1-#4	Washington	41 S	14 W	35 nwnwnw	37.1787	-113.3934	287527	4117379	12S	Calculated from trs
217	Lilim Claims	Grand	30 S	24 E	1 ce, 2 se	38.2057	-109.2381	654263	4230105	12S	Calculated from trs
218	Haas Limestone - Gunnison	Sanpete	18 S	1 E	32 swsw	39.2013	-111.8289	428427	4339443	12S	Calculated from trs
219	Jon Young quarry (state lease ML48973)	Wayne	29 S	5 E	16 lots 1,2,3,4	38.2899	-111.3679	467826	4238044	12S	Calculated from trs
220	United Stone (State lease ML 48322)	Duchesne	11 S	15 E	20 ne, 21all, 28 n2 sw nwse	39.8465	-110.2631	563042	4410980	12S	Calculated from trs
221	Lanny Jensen state lease	Sanpete	20 S	2 E	18 sese	39.0696	-111.7317	436702	4324754	12S	Calculated from trs
222	Ralph Simpson state lease	Uintah	5 S	22 E	32 senw nwse	40.3434	-109.4711	629852	4466994	12T	Calculated from trs
223	Reese Jenson state lease	Uintah	13 S	20 E	2 ne	39.7136	-109.6446	616180	4396848	12S	Calculated from trs
224	Bryce Haas state lease-1	Sanpete	19 S	2 E	16 w2w2ne, senw	39.1583	-111.6961	439855	4334570	12S	Copy from SubTerra
225	Bryce Haas state lease-2	Sanpete	19 S	1 E	5 nw & T18S-R1E-32 s2sw	39.1867	-111.8289	428413	4337822	12S	Calculated from trs
226	Rocky Mountain Supply (retail)	Bonneville	2 N	38 E	19	43.4847	-112.0443	415553	4815172	12T	Recorded
227	Squires Brick (retail)	Bonneville	2 N	38 E	7	43.5143	-112.0240	415552	4815171	12T	Recorded
228	April Garden Center (retail)	Spokane	29 N	42 E	34 swswne	47.9583	-117.5000	462672	5311786	11T	Read from map
229	Northern Stone Supply (yard)	Cassia	14 S	22 E	4 nenw	42.2417	-113.8833	262107	4680638	12T	Read from map
230	Oakley Stone (yard)	Cassia	14 S	22 E	3 nwne	42.2417	-113.8583	264170	4680568	12T	Read from map
231	Cedar Landscape Supply (retail)	Iron	36 S	11 W	11 cnw	37.6888	-113.0633	318075	4173291	12S	Read from map
232	3-H Landscaping Products (retail)	Washington	42 S	15 W	32 nene	37.0943	-113.5500	273371	4108376	12S	Read from map
233	Feller Stone (yard)	Washington	40 S	16 W	6 nene	37.3443	-113.6833	262308	4136445	12S	Read from map
234	Wal-Mart (retail)	Iron	36 S	11 W	22 nwsw	37.6533	-113.0867	315924	4169397	12S	Read from map
235	Rowland Stone (retail)	Washington	42 S	16 W	23 nwne	37.1222	-113.6110	268033	4111619	12S	Read from map
236	Rocanville Stone (yard)	Millard	17 S	7 W	12 nw	39.3583	-112.5943	362642	4357750	12S	Read from map
237	Gold Star Stone (yard)	Box Elder	14 N	17 W	24 sese	41.9155	-113.7396	272805	4644029	12T	Read from ArcMap
238	American Stone (yard)	Cassia	16 S	23 E	22 nwsw	42.0222	-113.7633	271220.2725	4655936	12T	Read from map
239	Ace Hardware/Spring Creek Stone (retail)	Bonner	56 N	2 E	34 nesw	48.1583	-116.1917	560111	5334211	11U	Read from map
240	Park Valley (yard)	Box Elder	13 N	13 W	31 nene	41.8145	-113.3682	303300	4631853	12T	Read from ArcMap
241	Brown's Canyon (D. Wurth)	Summit	1 S	5 E	20	40.7172	-111.3964	466517	4507436	12T	Read from ArcMap
242	State Stone saw plant	Wayne	29S	4E	24 senene	--	--	--	--	--	--

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Color	Geology	Generalized_Rock_Unit
214	R & W project	--	--	--
215	Kingston Canyon Rock	--	--	--
216	Michaud #1-#4	--	--	--
217	Lilim Claims	--	--	--
218	Haas Limestone - Gunnison	--	--	--
219	Jon Young quarry (state lease ML48973)	--	--	--
220	United Stone (State lease ML 48322)	Light brown	Upper Green River Form.	GreenRiver
221	Lanny Jensen state lease	--	Upper Green River Form.	GreenRiver
222	Ralph Simpson state lease	--	--	--
223	Reese Jenson state lease	--	Upper Green River Form.	GreenRiver
224	Bryce Haas state lease-1	Light brown	Green River Formation (Eocene)	GreenRiver
225	Bryce Haas state lease-2	Light brown	Green River Formation (Eocene)	GreenRiver
226	Rocky Mountain Supply (retail)	--	--	--
227	Squires Brick (retail)	--	--	--
228	April Garden Center (retail)	--	--	--
229	Northern Stone Supply (yard)	--	--	--
230	Oakley Stone (yard)	--	--	--
231	Cedar Landscape Supply (retail)	--	--	--
232	3-H Landscaping Products (retail)	--	--	--
233	Feller Stone (yard)	--	--	--
234	Wal-Mart (retail)	--	--	--
235	Rowland Stone (retail)	--	--	--
236	Rocanville Stone (yard)	--	--	--
237	Gold Star Stone (yard)	--	--	--
238	American Stone (yard)	--	--	--
239	Ace Hardware/Spring Creek Stone (retail)	--	--	--
240	Park Valley (yard)	--	--	--
241	Brown's Canyon (D. Wurth)	Light brown	Nugget Sandstone	Nugget
242	State Stone saw plant	--	--	--

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Lithologic_Description	Generalized_Lithology
214	R & W project	--	--
215	Kingston Canyon Rock	Rhyolite	Rhyolite
216	Michaud #1-#4	Sandstone	Sandstone
217	Lilim Claims	Limestone	Limestone
218	Haas Limestone - Gunnison	Limestone	Limestone
219	Jon Young quarry (state lease ML48973)	Sandstone	Sandstone
220	United Stone (State lease ML 48322)	--	Sandstone
221	Lanny Jensen state lease	Limestone	Limestone
222	Ralph Simpson state lease	--	--
223	Reese Jenson state lease	--	Sandstone
224	Bryce Haas state lease-1	Sandstone, flaggy, light brown to buff in color	Sandstone
225	Bryce Haas state lease-2	Sandstone, flaggy, light brown to buff in color	Sandstone
226	Rocky Mountain Supply (retail)	Photographs taken of all varieties of stone in inventory	--
227	Squires Brick (retail)	Photographs taken of all varieties of stone in inventory	--
228	April Garden Center (retail)	--	--
229	Northern Stone Supply (yard)	--	--
230	Oakley Stone (yard)	--	--
231	Cedar Landscape Supply (retail)	--	--
232	3-H Landscaping Products (retail)	--	--
233	Feller Stone (yard)	--	--
234	Wal-Mart (retail)	--	--
235	Rowland Stone (retail)	--	--
236	Rocanville Stone (yard)	--	--
237	Gold Star Stone (yard)	--	--
238	American Stone (yard)	--	--
239	Ace Hardware/Spring Creek Stone (retail)	--	--
240	Park Valley (yard)	--	--
241	Brown's Canyon (D. Wurth)	Sandstone, light tan to buff, splits into thin sheets with flat surfaces for rectangular pieces, pavers, and ashlar	Sandstone
242	State Stone saw plant	--	--

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Other_characteristics	Extraction_Fractures_Cleavability	Product_Dimension_Fractures_Cleavability
214	R & W project	--	--	--
215	Kingston Canyon Rock	--	--	--
216	Michaud #1-#4	--	--	--
217	Lilim Claims	--	--	--
218	Haas Limestone - Gunnison	--	--	--
219	Jon Young quarry (state lease ML48973)	--	--	--
220	United Stone (State lease ML 48322)	--	--	--
221	Lanny Jensen state lease	--	--	--
222	Ralph Simpson state lease	--	--	--
223	Reese Jenson state lease	--	--	--
224	Bryce Haas state lease-1	--	--	--
225	Bryce Haas state lease-2	--	--	--
226	Rocky Mountain Supply (retail)	--	--	--
227	Squires Brick (retail)	--	--	--
228	April Garden Center (retail)	--	--	--
229	Northern Stone Supply (yard)	--	--	--
230	Oakley Stone (yard)	--	Favorable with respect to extraction	Favorable with respect to product dimensions.
231	Cedar Landscape Supply (retail)	--	--	--
232	3-H Landscaping Products (retail)	--	--	--
233	Feller Stone (yard)	--	--	--
234	Wal-Mart (retail)	--	--	--
235	Rowland Stone (retail)	--	--	--
236	Rocanville Stone (yard)	--	--	--
237	Gold Star Stone (yard)	--	--	--
238	American Stone (yard)	--	--	--
239	Ace Hardware/Spring Creek Stone (retail)	--	--	--
240	Park Valley (yard)	--	--	--
241	Brown's Canyon (D. Wurth)	--	--	--
242	State Stone saw plant	--	--	--

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Influence_of_Texture	Uniform_Thickness	Lithology_Hardness_Durability	Rock_Quality_Suitability
214	R & W project	--	--	--	--
215	Kingston Canyon Rock	--	--	--	--
216	Michaud #1-#4	--	--	--	--
217	Lilim Claims	--	--	--	--
218	Haas Limestone - Gunnison	--	--	--	--
219	Jon Young quarry (state lease ML48973)	--	--	--	--
220	United Stone (State lease ML 48322)	--	--	--	--
221	Lanny Jensen state lease	--	--	--	--
222	Ralph Simpson state lease	--	--	--	--
223	Reese Jenson state lease	--	--	--	--
224	Bryce Haas state lease-1	--	--	--	--
225	Bryce Haas state lease-2	--	--	--	--
226	Rocky Mountain Supply (retail)	--	--	--	--
227	Squires Brick (retail)	--	--	--	--
228	April Garden Center (retail)	--	--	--	--
229	Northern Stone Supply (yard)	--	--	--	--
230	Oakley Stone (yard)	No Influence	--	Advantageous	Readily cleaves into hard, durable aggregate
231	Cedar Landscape Supply (retail)	--	--	--	--
232	3-H Landscaping Products (retail)	--	--	--	--
233	Feller Stone (yard)	--	--	--	--
234	Wal-Mart (retail)	--	--	--	--
235	Rowland Stone (retail)	--	--	--	--
236	Rocanville Stone (yard)	--	--	--	--
237	Gold Star Stone (yard)	--	--	--	--
238	American Stone (yard)	--	--	--	--
239	Ace Hardware/Spring Creek Stone (retail)	--	--	--	--
240	Park Valley (yard)	--	--	--	--
241	Brown's Canyon (D. Wurth)	--	--	--	--
242	State Stone saw plant	--	--	--	--

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Size	Ease_of_Extraction	Extent_of_Deposit	Reserve_Limits_Overburden
214	R & W project	Small	--	--	--
215	Kingston Canyon Rock	Small	--	--	--
216	Michaud #1-#4	Small	--	--	--
217	Lilim Claims	Small	--	--	--
218	Haas Limestone - Gunnison	Small	--	--	--
219	Jon Young quarry (state lease ML48973)	Small	--	--	--
220	United Stone (State lease ML 48322)	Medium	--	--	--
221	Lanny Jensen state lease	Medium	--	--	--
222	Ralph Simpson state lease	Small	--	--	--
223	Reese Jenson state lease	Medium	--	--	--
224	Bryce Haas state lease-1	Large	--	--	--
225	Bryce Haas state lease-2	Large	--	--	--
226	Rocky Mountain Supply (retail)	Yard-retail	--	--	--
227	Squires Brick (retail)	Yard-retail	--	--	--
228	April Garden Center (retail)	Yard-retail	--	--	--
229	Northern Stone Supply (yard)	Yard-wholesale	--	--	--
230	Oakley Stone (yard)	Yard-wholesale	Moderately easy (extraction by ripping)	Extended	Extensive reserves > 10 years
231	Cedar Landscape Supply (retail)	Yard-retail	--	--	--
232	3-H Landscaping Products (retail)	Yard-retail	--	--	--
233	Feller Stone (yard)	Yard-wholesale	--	--	--
234	Wal-Mart (retail)	Yard-retail	--	--	--
235	Rowland Stone (retail)	Yard-retail	--	--	--
236	Rocanville Stone (yard)	Yard-wholesale	--	--	--
237	Gold Star Stone (yard)	Yard-operations	--	--	--
238	American Stone (yard)	Yard-operations	--	--	--
239	Ace Hardware/Spring Creek Stone (retail)	Yard-retail	--	--	--
240	Park Valley (yard)	Yard-operations	--	--	--
241	Brown's Canyon (D. Wurth)	Large	--	--	Extensive > 10 year reserve
242	State Stone saw plant	Yard, plant	--	--	--

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Number_Products	Known_Products	Acres	Mining_Method	Hand_Methods
214	R & W project	--	Sand and gravel for landscape rock	--	--	--
215	Kingston Canyon Rock	--	--	--	--	--
216	Michaud #1-#4	--	--	--	--	--
217	Lilim Claims	--	--	--	--	--
218	Haas Limestone - Gunnison	--	Building stone, palleted block	--	--	--
219	Jon Young quarry (state lease ML48973)	--	--	--	--	--
220	United Stone (State lease ML 48322)	--	--	--	Hand only	Surface collection
221	Lanny Jensen state lease	--	--	--	Hand only	Surface collection
222	Ralph Simpson state lease	--	--	--		
223	Reese Jenson state lease	--	Curbstone-like product	--	Hand only	Surface collection
224	Bryce Haas state lease-1	--	Saw block, stand-up flagstone, premium flagstone, snap ledger, boulders, ground cover, dry stack, guillotined flagstone, 3/4-inch minus, tumbled flagstone, wall rock	--	Hand only	Surface collection
225	Bryce Haas state lease-2	--		--	Hand only	Surface collection
226	Rocky Mountain Supply (retail)	--	--	--	--	--
227	Squires Brick (retail)	--	--	--	--	--
228	April Garden Center (retail)	--	--	--	--	--
229	Northern Stone Supply (yard)	--	--	--	--	--
230	Oakley Stone (yard)	Probable (3-5 Products)	Flagstone, large landscape rocks	--	--	--
231	Cedar Landscape Supply (retail)	--	--	--	--	--
232	3-H Landscaping Products (retail)	--	--	--	--	--
233	Feller Stone (yard)	--	--	--	--	--
234	Wal-Mart (retail)	--	--	--	--	--
235	Rowland Stone (retail)	--	--	--	--	--
236	Rocanville Stone (yard)	--	--	--	--	--
237	Gold Star Stone (yard)	--	--	--	--	--
238	American Stone (yard)	--	--	--	--	--
239	Ace Hardware/Spring Creek Stone (retail)	--	--	--	--	--
240	Park Valley (yard)	--	--	--	--	--
241	Brown's Canyon (D. Wurth)	--	Flagstone, building stone, landscape rock	5+	Hand-mechanized combined	Hand split, sort
242	State Stone saw plant	--	--	--	--	--

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Mining_Description	Production_rate
214	R & W project	--	--
215	Kingston Canyon Rock	--	--
216	Michaud #1-#4	--	--
217	Lilim Claims	--	--
218	Haas Limestone - Gunnison	--	--
219	Jon Young quarry (state lease ML48973)	--	--
220	United Stone (State lease ML 48322)	--	--
221	Lanny Jensen state lease	--	--
222	Ralph Simpson state lease	--	--
223	Reese Jenson state lease	--	--
224	Bryce Haas state lease-1	Quarrying operation	--
225	Bryce Haas state lease-2	Quarrying operation	--
226	Rocky Mountain Supply (retail)	--	--
227	Squires Brick (retail)	--	--
228	April Garden Center (retail)	--	--
229	Northern Stone Supply (yard)	--	40,000 tons per year, all pits combined (SubTerra, 2002)
230	Oakley Stone (yard)	--	--
231	Cedar Landscape Supply (retail)	--	--
232	3-H Landscaping Products (retail)	--	--
233	Feller Stone (yard)	--	--
234	Wal-Mart (retail)	--	--
235	Rowland Stone (retail)	--	--
236	Rocanville Stone (yard)	--	--
237	Gold Star Stone (yard)	--	Ship 1 to 5 semi loads/day from yard of 16 pallets each which come from all operations; two quarries are operating at time: Chocolate Charcoal and Lone Pine
238	American Stone (yard)	--	--
239	Ace Hardware/Spring Creek Stone (retail)	--	--
240	Park Valley (yard)	--	--
241	Brown's Canyon (D. Wurth)	Drills, blasts from outcrop, uses excavator and wheel loaders to move material to yard area where material is split by hand labor, then stacked on pallets where wrapped and banded for retail sale	2000 tons per year
242	State Stone saw plant	--	--

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Processing_onsite	Work_schedule	Personnel	Buildings
214	R & W project	--	--	--	--
215	Kingston Canyon Rock	--	--	--	--
216	Michaud #1-#4	--	--	--	--
217	Lilim Claims	--	--	--	--
218	Haas Limestone - Gunnison	--	--	--	--
219	Jon Young quarry (state lease ML48973)	--	--	--	--
220	United Stone (State lease ML 48322)	--	--	--	--
221	Lanny Jensen state lease	--	--	--	--
222	Ralph Simpson state lease	--	--	--	--
223	Reese Jenson state lease	--	--	--	--
224	Bryce Haas state lease-1	--	--	--	--
225	Bryce Haas state lease-2	--	--	--	--
226	Rocky Mountain Supply (retail)	--	--	--	--
227	Squires Brick (retail)	--	--	--	--
228	April Garden Center (retail)	--	--	--	--
229	Northern Stone Supply (yard)	--	--	--	--
230	Oakley Stone (yard)	--	--	--	--
231	Cedar Landscape Supply (retail)	--	--	--	--
232	3-H Landscaping Products (retail)	--	--	--	--
233	Feller Stone (yard)	--	--	--	--
234	Wal-Mart (retail)	--	--	--	--
235	Rowland Stone (retail)	--	--	--	--
236	Rocanville Stone (yard)	--	--	--	--
237	Gold Star Stone (yard)	--	--	--	--
238	American Stone (yard)	--	--	--	--
239	Ace Hardware/Spring Creek Stone (retail)	--	--	--	--
240	Park Valley (yard)	--	--	--	--
241	Brown's Canyon (D. Wurth)	Haul to yard split by hand labor	5d/wk, 6 mos./yr	6	--
242	State Stone saw plant			1 lead man; two laborers	3 buildings

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Equipment	Product_inventory
214	R & W project	--	--
215	Kingston Canyon Rock	--	--
216	Michaud #1-#4	--	--
217	Lilim Claims	--	--
218	Haas Limestone - Gunnison	--	--
219	Jon Young quarry (state lease ML48973)	--	--
220	United Stone (State lease ML 48322)	--	--
221	Lanny Jensen state lease	--	--
222	Ralph Simpson state lease	--	--
223	Reese Jenson state lease	--	--
224	Bryce Haas state lease-1	--	--
225	Bryce Haas state lease-2	--	--
226	Rocky Mountain Supply (retail)	--	--
227	Squires Brick (retail)	--	--
228	April Garden Center (retail)	--	--
229	Northern Stone Supply (yard)	--	--
230	Oakley Stone (yard)	--	--
231	Cedar Landscape Supply (retail)	--	--
232	3-H Landscaping Products (retail)	--	--
233	Feller Stone (yard)	--	--
234	Wal-Mart (retail)	--	--
235	Rowland Stone (retail)	--	--
236	Rocanville Stone (yard)	--	--
237	Gold Star Stone (yard)	--	--
238	American Stone (yard)	--	--
239	Ace Hardware/Spring Creek Stone (retail)	--	--
240	Park Valley (yard)	--	--
241	Brown's Canyon (D. Wurth)	Drill, excavator, wheel loader, 3 track hoe, haul truck, forklift, 2 skidsteers, 2 guillotines, 1 tumbler	--
242	State Stone saw plant	Circular saw, polishing table, band saw, chain saw, cris cutter, front end loader; haul trucks	--

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Sales_price	Market_description	Destination
214	R & W project	--	--	--
215	Kingston Canyon Rock	--	--	--
216	Michaud #1-#4	--	--	--
217	Lilim Claims	--	--	--
218	Haas Limestone - Gunnison	--	--	--
219	Jon Young quarry (state lease ML48973)	--	--	--
220	United Stone (State lease ML 48322)	--	--	--
221	Lanny Jensen state lease	--	--	--
222	Ralph Simpson state lease	--	--	--
223	Reese Jenson state lease	--	--	--
224	Bryce Haas state lease-1	--	--	--
225	Bryce Haas state lease-2	--	--	--
226	Rocky Mountain Supply (retail)	--	--	--
227	Squires Brick (retail)	--	--	--
228	April Garden Center (retail)	--	--	--
229	Northern Stone Supply (yard)	--	--	--
230	Oakley Stone (yard)	--	Markets in Japan, Virgin Is., NJ, HI, CA, AZ, but most rock shipped to CA; loaded 3 semi loads today and average 12 to 14 per week.	--
231	Cedar Landscape Supply (retail)	--	--	--
232	3-H Landscaping Products (retail)	--	--	--
233	Feller Stone (yard)	--	--	--
234	Wal-Mart (retail)	--	--	--
235	Rowland Stone (retail)	--	--	--
236	Rocanville Stone (yard)	--	--	--
237	Gold Star Stone (yard)	--	--	--
238	American Stone (yard)	--	--	--
239	Ace Hardware/Spring Creek Stone (retail)	--	--	--
240	Park Valley (yard)	--	--	--
241	Brown's Canyon (D. Wurth)	$160/ton, flagstone; $35/ton, boulders	Park City and Heber City, UT areas	Local Heber area
242	State Stone saw plant	--	--	--

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Prod_1995	Prod_1996	Prod_1997	Prod_1998	Prod_1999	Prod_2000	Prod_2001	Prod_2002	Prod_2003	Prod_2004	Max_prod
214	R & W project									0	300	300
215	Kingston Canyon Rock										1155	1155
216	Michaud #1-#4										10	10
217	Lilim Claims				0	NR	0	0	NR	NR	NR	
218	Haas Limestone - Gunnison				0	NR	NR	NR	NR	NR	NR	
219	Jon Young quarry (state lease ML48973)							Confid.	Confid.			Confid.
220	United Stone (State lease ML 48322)					Confid.	Confid.	Confid.	Confid.			Confid.
221	Lanny Jensen state lease			NR	Confid.	Confid.	944	Confid.	NR	NR	NR	Confid.
222	Ralph Simpson state lease									0	73	73
223	Reese Jenson state lease						Confid.	Confid.	Confid.	Confid.	Confid.	Confid.
224	Bryce Haas state lease-1								Confid.	Confid.	Confid.	Confid.
225	Bryce Haas state lease-2							Confid.				Confid.
226	Rocky Mountain Supply (retail)											
227	Squires Brick (retail)											
228	April Garden Center (retail)											
229	Northern Stone Supply (yard)											
230	Oakley Stone (yard)											
231	Cedar Landscape Supply (retail)											
232	3-H Landscaping Products (retail)											
233	Feller Stone (yard)											
234	Wal-Mart (retail)											
235	Rowland Stone (retail)											
236	Rocanville Stone (yard)											
237	Gold Star Stone (yard)											
238	American Stone (yard)											
239	Ace Hardware/Spring Creek Stone (retail)											
240	Park Valley (yard)											
241	Brown's Canyon (D. Wurth)											
242	State Stone saw plant											

Listing of landscape stone and building stone quarries, mill sites, and yards, Utah, and parts of Arizona, Idaho, Montana, Washington, and Wyoming (STONE_SITES.XLS) Sorted by 1-Location_state, 2-Surface_mgmt, 3-Name.

IDNo	Name	Comments
214	R & W project	Opened in 2003
215	Kingston Canyon Rock	Opened in 2004
216	Michaud #1-#4	Opened in 2004
217	Lilim Claims	Opened in 1997
218	Haas Limestone - Gunnison	Opened in 2000 ID Nos. 191 and 218 appear as same property.
219	Jon Young quarry (state lease ML48973)	SITLA production data here is CONFIDENTIAL
220	United Stone (State lease ML 48322)	SITLA production data here is CONFIDENTIAL
221	Lanny Jensen state lease	SITLA production data here is CONFIDENTIAL
222	Ralph Simpson state lease	SITLA production data here is CONFIDENTIAL
223	Reese Jenson state lease	SITLA production data here is CONFIDENTIAL
224	Bryce Haas state lease-1	SITLA production data here is CONFIDENTIAL
225	Bryce Haas state lease-2	SITLA production data here is CONFIDENTIAL
226	Rocky Mountain Supply (retail)	--
227	Squires Brick (retail)	--
228	April Garden Center (retail)	--
229	Northern Stone Supply (yard)	--
230	Oakley Stone (yard)	--
231	Cedar Landscape Supply (retail)	--
232	3-H Landscaping Products (retail)	--
233	Feller Stone (yard)	--
234	Wal-Mart (retail)	--
235	Rowland Stone (retail)	--
236	Rocanville Stone (yard)	--
237	Gold Star Stone (yard)	--
238	American Stone (yard)	--
239	Ace Hardware/Spring Creek Stone (retail)	--
240	Park Valley (yard)	--
241	Brown's Canyon (D. Wurth)	--
242	State Stone saw plant	--

CHAPTER 2

EVALUATION OF DEPOSIT CHARACTERISTICS AND QUARRYING PRACTICES

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ABSTRACT

Building stone quarries and yards were inventoried during 2004. A total of 216 quarries and 26 yards are included in the study area of Utah, Arizona, Idaho, Montana, Washington, and Wyoming. This chapter presents an analysis of the deposit characteristics, stone production, and quarrying practices of the sites compiled from that inventory (Chapter 1). Deposit characteristics may include operating status, BLM case type, rock type, and geologic age. Stone production was viewed by size, rank, and annual basis. Quarrying practices can include hand-only or mechanized collection, or some combination of both, while processing varies widely to suit customer needs.

This study reveals that stone is removed from numerous geologic formations ranging in age from Precambrian to Recent. Quarried rock includes gneiss, marble, amphibolite, quartzite, slate, argillite, schist, sandstone, limestone, dolomite, basalt, rhyolite, tuff, and granite. Quartzite, sandstone, and limestone are the units most frequently quarried, and are responsible for most of the quantity produced.

Total stone production from quarries studied in 2004 was 165,861 tons from 68 quarries (31 percent) of all quarries studied in all states. Ninety-nine percent of 2004 stone production came from 42 quarries producing 200 or more tons annually. The largest five producing quarries in 2004, or those that produced 5000 or more tons annually, had a combined production of 97,555 tons, or 58.8 percent of all quarry production in 2004. Utah's top ranked stone producing counties in 2004 were Summit County, Box Elder County, Beaver County, and Iron County. In Idaho, the top producing counties in 2004 were Custer County and Cassia County. The combined production of stone in 2004 from state and private lands about equals the combined production of stone from federal lands. Sites on federal lands include unpatented mining claims, material sales, common use and community pit sites.

Utah's recorded production of quarried stone increased more than eight-fold from 11,589 tons in 1995 to a high of 102,202 tons in 2001, and then decreased to 91,489 tons in 2004. Only 53 percent of the quarries produced stone during the 1995-2004 period. The other quarries were either insignificant in size or the quantities were not reported.

The array of common quarrying and processing practices include hand-splitting and sorting, hand collection where mechanized equipment is prohibited, and the use of varied assortments of mechanized equipment such as hydraulic excavators, haul trucks, front end loaders, dozers, and forklifts. Less common quarry practices include drilling and blasting to assist the hand labor, crushing and sorting for sizing of landscape aggregate, use of hydraulic splitter and/or a rock tumbler to create consistent size or paver blocks, gang saws, and large-scale wire and bar saws to create slabs, tiles, and other stone of exact dimension.

INTRODUCTION

Chapter 1 surveyed quarries and yards to gather relevant descriptive information of building stone in Utah and selected sites in nearby states of Arizona, Idaho, Montana, Washington, and Wyoming. The inventory report contains information from 242 quarries and yards. Of these, 168 quarries and 26 yards were visited by the author. Field work consisted of visiting and collecting quarry and deposit data in 2004 for quarries and yards from which building stone is produced in the study area (figure 1).

The purpose of chapter 2 is to summarize and interpret data about deposit characteristics and the diverse quarrying and processing practices of stone introduced in the inventory in Chapter 1. This chapter also documents the location, geology, operations, products, and amount of stone removed from quarries. Although this investigation focuses on Utah where the majority of sites are found, it is limited by the inventory data. The wide geographic area of investigation enables the examination of the wide variation in geologic formations and lithologic units that are host to the resources of building stone across the region. Quarries produce rough and processed stone used for building, ornamental, and landscape purposes that include granite, quartzite, slate, shale, sandstone, limestone, and volcanic rock.

This chapter is divided into two sections. The first section, Site and Deposit Characteristics analyzes the operating status, annual production, size of operations, case type, and types of materials quarried. Case type refers to the method of administration of the lands and how stone is sold by the federal government. Types of quarried materials include rock type (lithology), geologic formation unit, and availability of materials examined.

The methods used to extract stone for building purposes are reported in the second section on Quarrying Practices which addresses the current methods used to remove and ready the stone for market. Important processing methods are hand sorting, crushing, or dressing (tumbling, splitting, fashioning, or sawing) of rock that may produce a number of different products and exhibit a variety of physical characteristics that directly affect the marketing and sales of the final products. In addition, these processing practices often add value to the stone which may result in development of new niches in the market.

SITE AND DEPOSIT CHARACTERISTICS

Inventory

The field work conducted in 2004 produced an inventory of locations and attributes of stone and mining operations from quarries in Utah and several other states that produce building stone. The 242 active or inactive quarries (tables 5-19 in chapter 1) and yards (table 4 in chapter 1) included in the inventory are the basis for this analysis. The details of this inventory are contained in the spreadsheet, stone_sites.xls. The operations yards are often an integral part of the quarry operation and may be used for a variety of purposes such as equipment maintenance, field offices, a storage site of palletized stone product, a site for further processing of the stone, a shipping point for wholesale products to customers or dealers, or some combination of these. The yards identified as retail in this table, on the other hand, are operated by retail dealers where the only business is the retail sale of rock to building or landscape contractors or to retail customers. Such selling is unrelated to the quarry operation and not conducted by the quarry owner, with two exceptions. At least

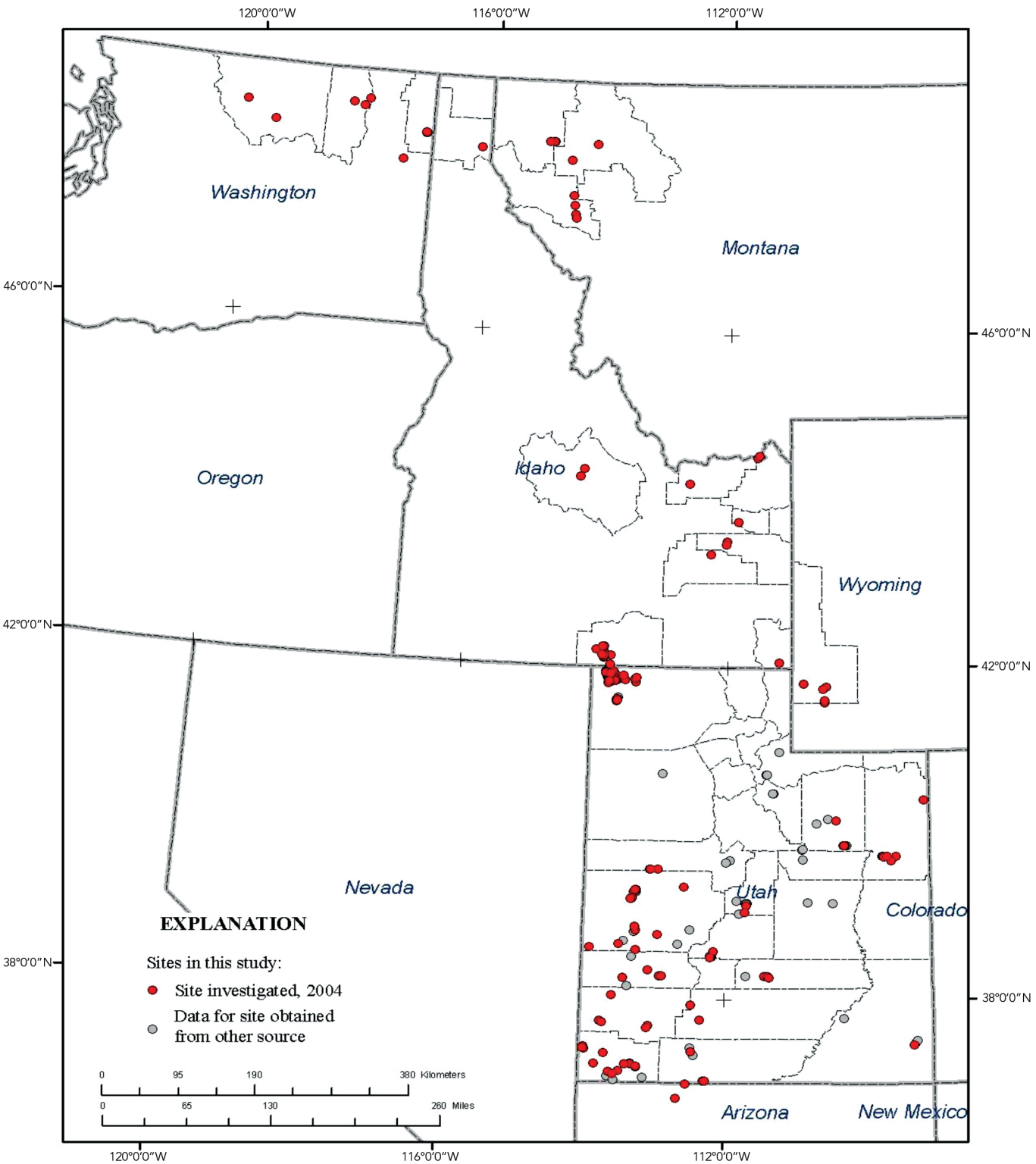


Figure 1 *Location map of sites.*

two quarry businesses are vertically integrated because they conduct quarrying, wholesale distribution, and retail selling.

Operating Status of Quarries and Yards

The categories of operating status of quarries, based on data from this inventory or data from DOGM, are as follows: proposed, explored (or raw), active (or intermittently active), inactive, or past producers (see table 2 in chapter 1). Little or no disturbance has occurred at proposed prospects where mine permitting may be underway. Explored or raw prospects have little to no disturbance, but the sites are likely permitted. Active or intermittently active quarries are permitted mining operations and represent the largest group. Inactive quarries are those that have not seen recent activity, although they have a current State of Utah mining permit and bond. Past producers are inactive sites where the mine permit case file has been closed and the sites may be reclaimed. The geographic distributions of the operating status of quarries are shown for Washington, Idaho, and Montana (figure 2) and for Utah (figure 3).

Stone Production

The production of stone is examined in two ways: (1) annual production during the 1995-2004 period with a focus on production in 2004; and (2) a ranking of quarries by size based on peak (maximum) production during 1995-2004.

Annual Production, 1995-2004

The quantity of building stone produced by Utah operations shows a period of rapid growth that peaks in 2001, followed by a production decline in 2002-2003 and increased production again in 2004 (figure 4) (SITLA, 2005). The BLM's recorded production (Legacy Rehost 2000 data base [LR2000]) is not included. The peak in 2001 and subsequent two-year decline, are echoed by two rock operators who state that their production declined by at least one-half due to lack of orders in the post-September 2001 period.

Production information for quarries outside of Utah in 2004 was provided by the operators and is based on only five operators investigated—the Three Rivers quarry, (Idaho), Cumberland Gap Hearth Stone (Wyoming), Bead Lake quarry, (Washington), Scrivanich Stone (Idaho) and Fish Creek (Idaho), so a study-area-wide comparison of quarries is not possible. Three Rivers Stone in Custer County, Idaho, the largest producer included in the study, with reported production of 34,000 tons in 2003 and 36,000 tons in 2004, represents about one-half of all non-Utah stone production in this evaluation.

Annual Production in 2004

The total production reported for operations investigated in 2004 is 159,860 tons. The five largest producers in 2004 (figure 5), or those producing more than 5,000 tons in 2004, were Three Rivers Stone, Custer County, Idaho (36,000 tons), Scrivanich Natural Stone, Cassia County, Utah (20,000 tons), Bright quarry, Iron County, Utah (18,500 tons), Browns Canyon #1 Mine (Mountain Valley Stone), Summit County, Utah (17,295 tons), and Bead Lake quarry, Pend Oreille County, Washington (5760 tons). Together, these quarries accounted for more than 58 percent of all production reported in the study. Seventeen other operations located in Utah, Idaho, Washington, or Wyoming, produced between 2000 tons and 5000 tons in 2004, and twenty other operations produced between 200 tons and 2000 tons in 2004 (table 1). Operations producing more than 2000 tons annually accounted for about 90 percent of production of stone in 2004.

Ranking and Size

Size or ranking is measured as the peak production (or maximum) for any year during 1995-2004. By this measure, quarries are first ranked by their production, and then the ranking is used to define their size, whether small, medium, or large size quarries. Rank is determined, differently than above, as the peak year of production of stone during the ten-year period 1995-2004. This peak production quantity is a better a measure than size because of the irregular production volumes that are common for most quarries and because the rank method includes a larger number of quarries. Summit County ranks highest for all Utah counties based on ranked production of building stone (figure 6). Custer County has the highest ranking for all Idaho counties in stone production. Five quarries operate in Summit County in Utah and two quarries operate in Custer County in Idaho. Utah's Box Elder, Sanpete, and Washington counties rank third, fourth, and fifth, respectively.

Building stone operations are divided into four categories based on size of production: unknown, small, medium, or large. The advantage in using the peak production method is that 126 quarries can be evaluated for size using their peak production whereas only 68 quarries reported production in 2004. Ninety-one quarries either had no production (or failed to report production) during 1995-2004. Table 2 shows the number of quarries by ownership category and divided by size ranking according to their peak production. A small operation is less than 200 tons of annual production, a medium size operation is 200 to 2000 tons, and a large operation exceeds 2000 tons annually. The largest number of operations in each of the four categories is found on state lands or private lands in Utah. The median production quantity for the small, medium, and large size categories is 90 tons, 770 tons, and 4000 tons, respectively.

A chart of quarry operations using the categories of small, medium, large, and no production, is shown in figure 7, and the locations shown on a map in figure 8.

Type of Operation

The right to quarry stone on federal lands is procured under existing federal law and according to rules set by the managing agency. These methods for removal of stone are identified by the case type for sites on federal lands. For example, lands may be claimed by locating mining claims on BLM or National Forest (NF) lands, or federal land managers may establish non-exclusive or exclusive material sales, or common use areas or community pits may be established for sale of materials to governments and to the public. The various categories are listed by case type and other ownership categories in table 5 of chapter 1 for sites investigated

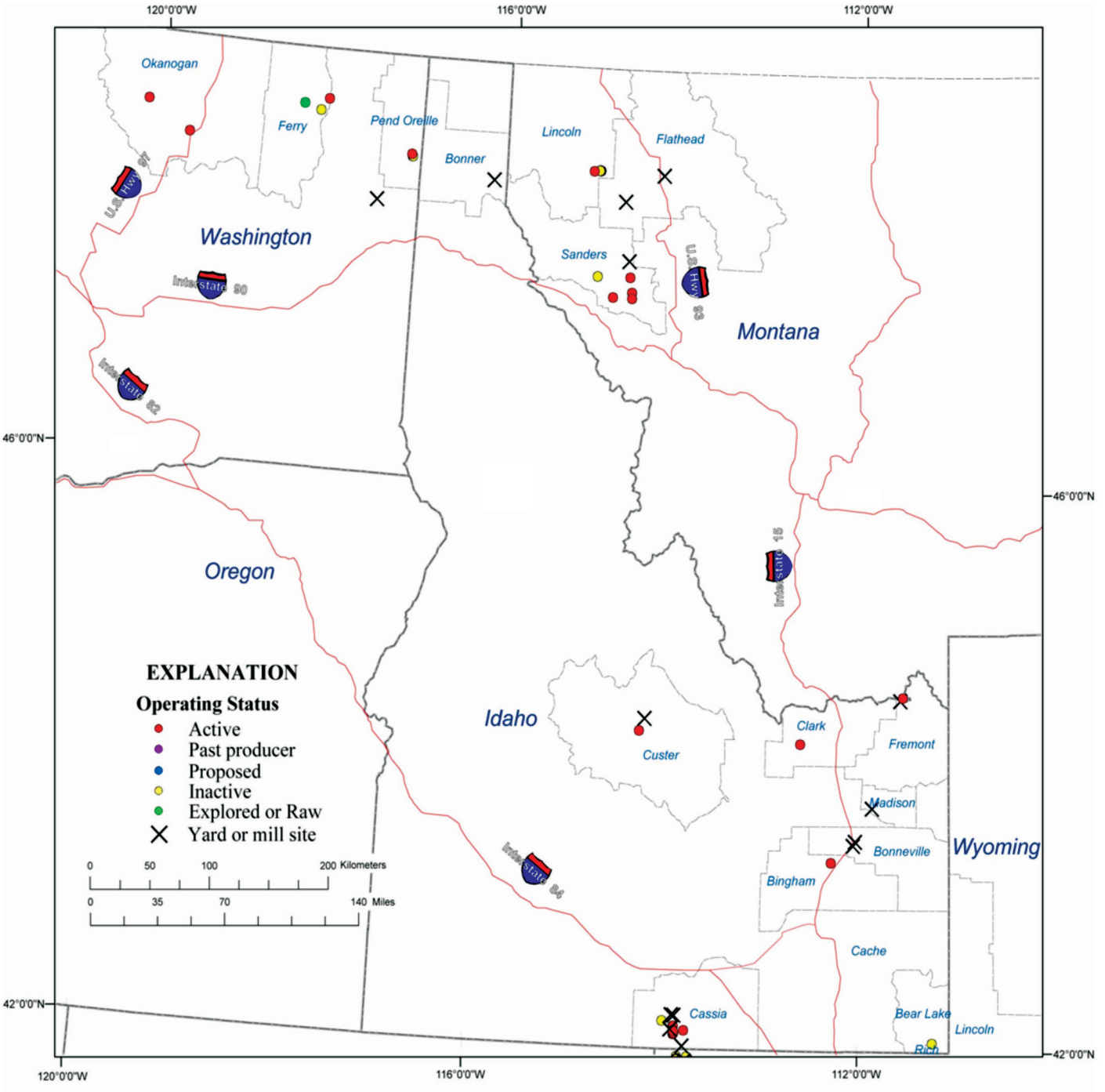


Figure 2. *Operating status of sites in Washington, Idaho, and Montana.*

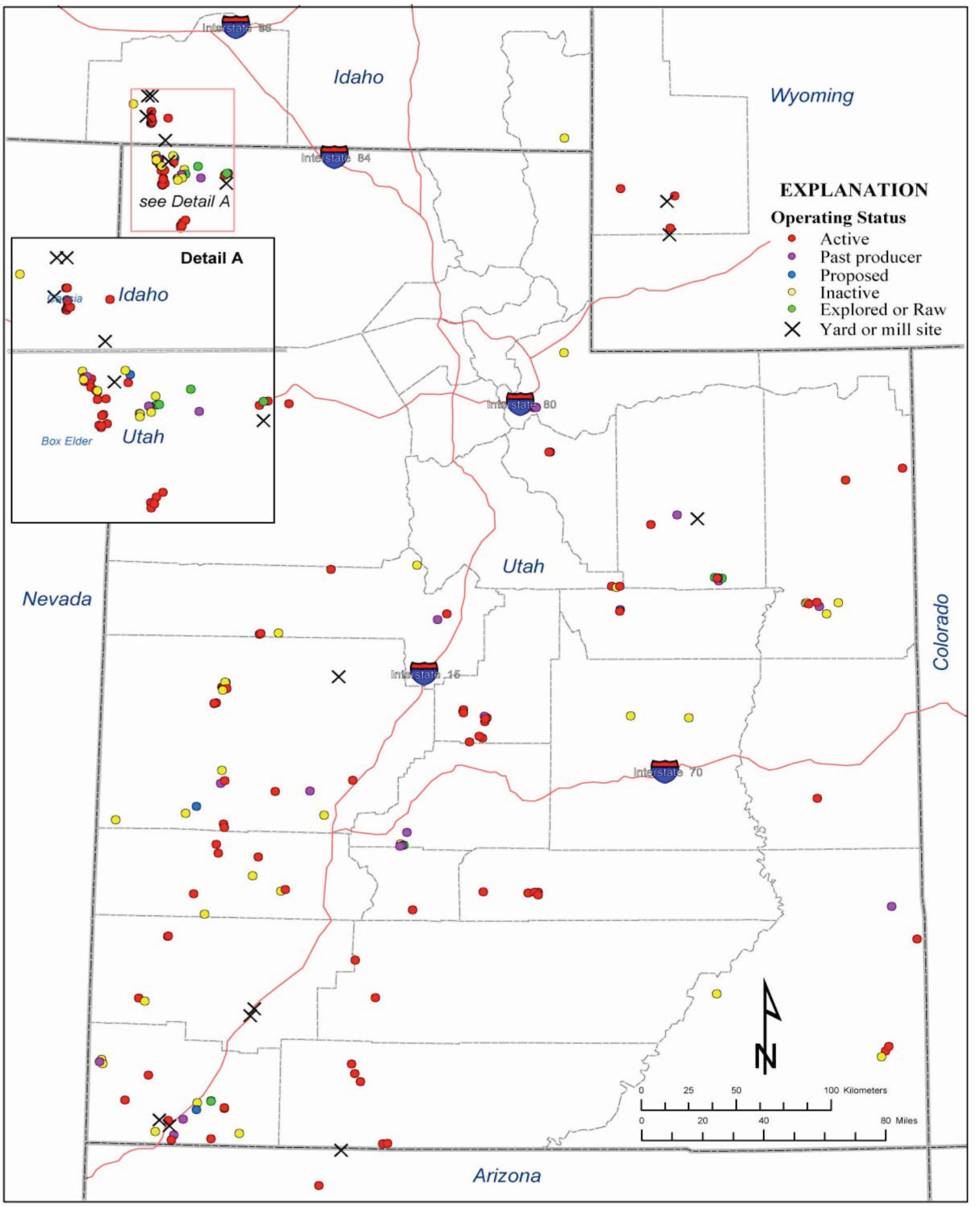


Figure 3. *Operating status for sites in Utah, southwestern Wyoming, and southern Idaho.*

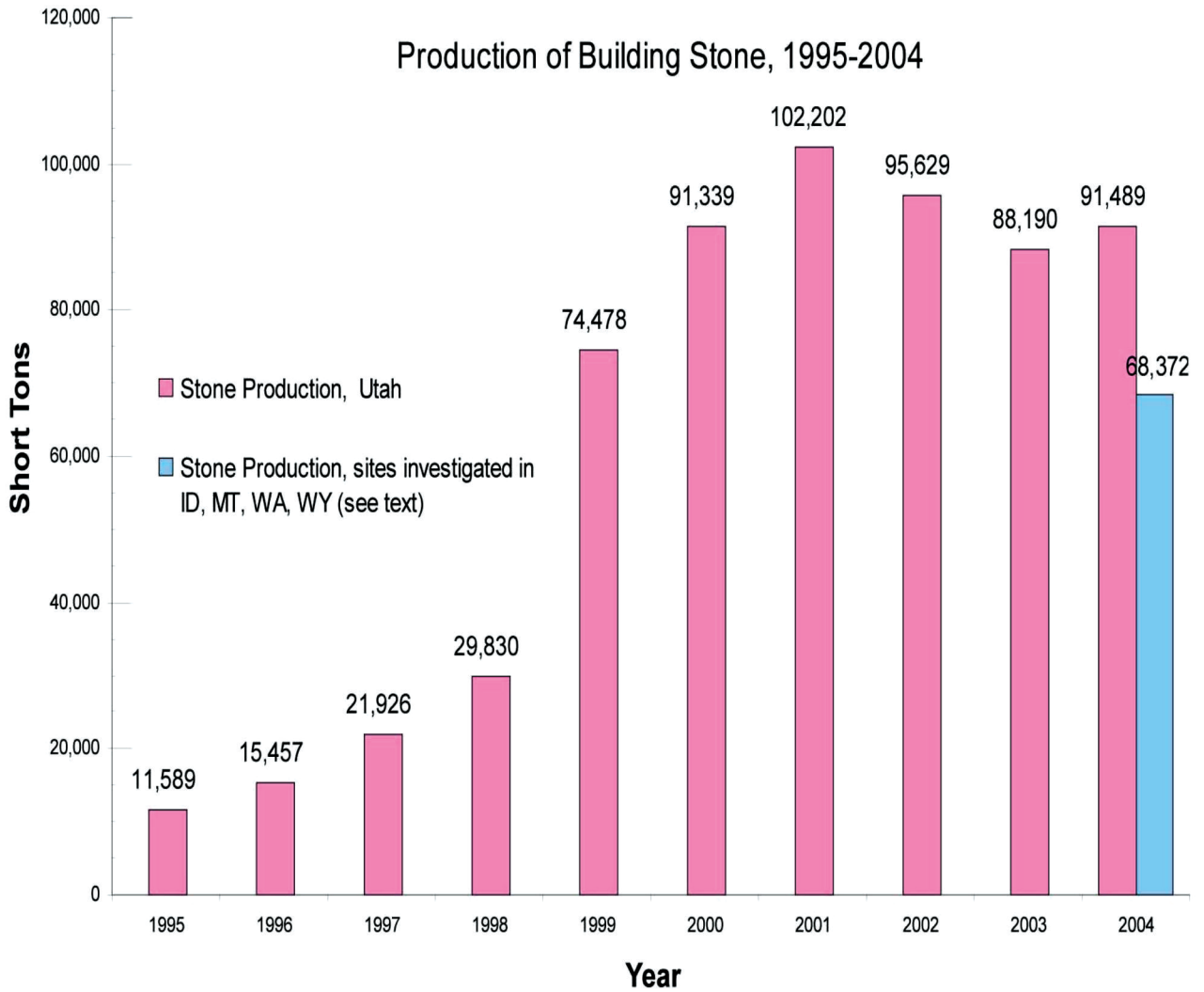


Figure 4. *Graph showing annual production of building stone, 1995-2004, for operations investigated. Data reported for Utah is considered the best available data at this time. Data reported for other states is presented only for comparison purposes; it represents production from only the quarries investigated and does not represent the total production for any of those states. The sources of data include: DOGM, SITLA, and quarry operators. Production data for 2004 for states outside Utah (68,472 tons) is incomplete because it represents data for only those sites investigated during this study. See text for additional comments.*

Table 1. *Quarried stone production in 2004 for study area.*

Size (in tons)	Number of quarries	Tons produced, 2004	Production, percent of total*	Cumulative percent
>5,000	5	97,555	58.8	58.8
2,000 - 5,000	17	52,060	31.4	90.2
200 - 2,000	20	14,692	8.9	99.1
<200	26	1,554	0.9	100.0
	68	165,861	100.0	

*Numbers may not add to 100.0 percent due to independent rounding

Table 2. *List of quarries by ranked size and ownership.*

(FO BLM field office; NF National Forest; FS BLM field station; entries in italics explained in text)

State	Boundary	County	Size (Peak Production) in tons				
				Small	Medium	Large	Total
			No Production or Unknown	<200	200-2,000	>2,000	
AZ	Kanab FO-Ariz. Strip FO	Mohave	1				1
ID	*Burley FO*	*Cassia*	*4*	*1*	*9*	*1*	*15*
ID	Challis FO	Custer				1	1
ID	Idaho Falls FO	Bingham	1				1
ID	Idaho Falls FO	Clark	1				1
ID	Pocatello FO	Bear Lake	1				1
ID	Targhee NF	Clark	1		1		2
ID-UT	*Sawtooth NF*	*Cassia*				*1*	*1*
ID-UT	*Sawtooth NF*	*Box Elder*	*6*	*1*	*1*	*1*	*9*
MT	Kootenai NF	Lincoln	4				4
MT	Kootenai NF	Sanders	5				5
UT	Cedar City FO	Beaver	4	2	1	2	9
UT	Cedar City FO	Iron		1	1	1	3
UT	Fillmore FO	Juab		5	1		6
UT	Fillmore FO	Millard	11	9	1	1	22
UT	Kanab FO	Garfield	2				2
UT	Kanab FO	Kane	3			2	5
UT	Moab FO	Grand	1	1			2
UT	Monticello FO	San Juan	1	1	2	1	5
UT	Price FO	Carbon	1		1		2
UT	Price FO	Emery		1	1		2
UT	Richfield FO	Sanpete	2	2	4	3	11
UT	Richfield FO	Sevier	4		1		5
UT	Richfield FO	Piute			1		1
UT	Richfield FO Hanksville FS	Wayne	2	2	1		5
UT	*Salt Lake FO*	*Box Elder*	*20*	*1*	*7*	*8*	*36*
UT	Salt Lake FO	Summit	1	1		4	6
UT	Salt Lake FO	Toole		1			1
UT	Salt Lake FO	Utah	1	1	1		3
UT	Salt Lake FO	Wasatch		1	1	1	3
UT	St George	Washington	3	4	8	2	17
UT	Vernal FO	Duchesne	1	2	2	1	6
UT	Vernal FO	Uintah	3	3	2	1	9
WA	Okanogan-Colville NF	Ferry	3	1			4
WA	Okanogan-Colville NF	Okanogan	1	1			2
WA	Okanogan-Colville NF	Pend Oreille	2		1	1	4
WY	Kemmerer FO	Lincoln	1		1	1	3
	Total		91	42	49	33	215

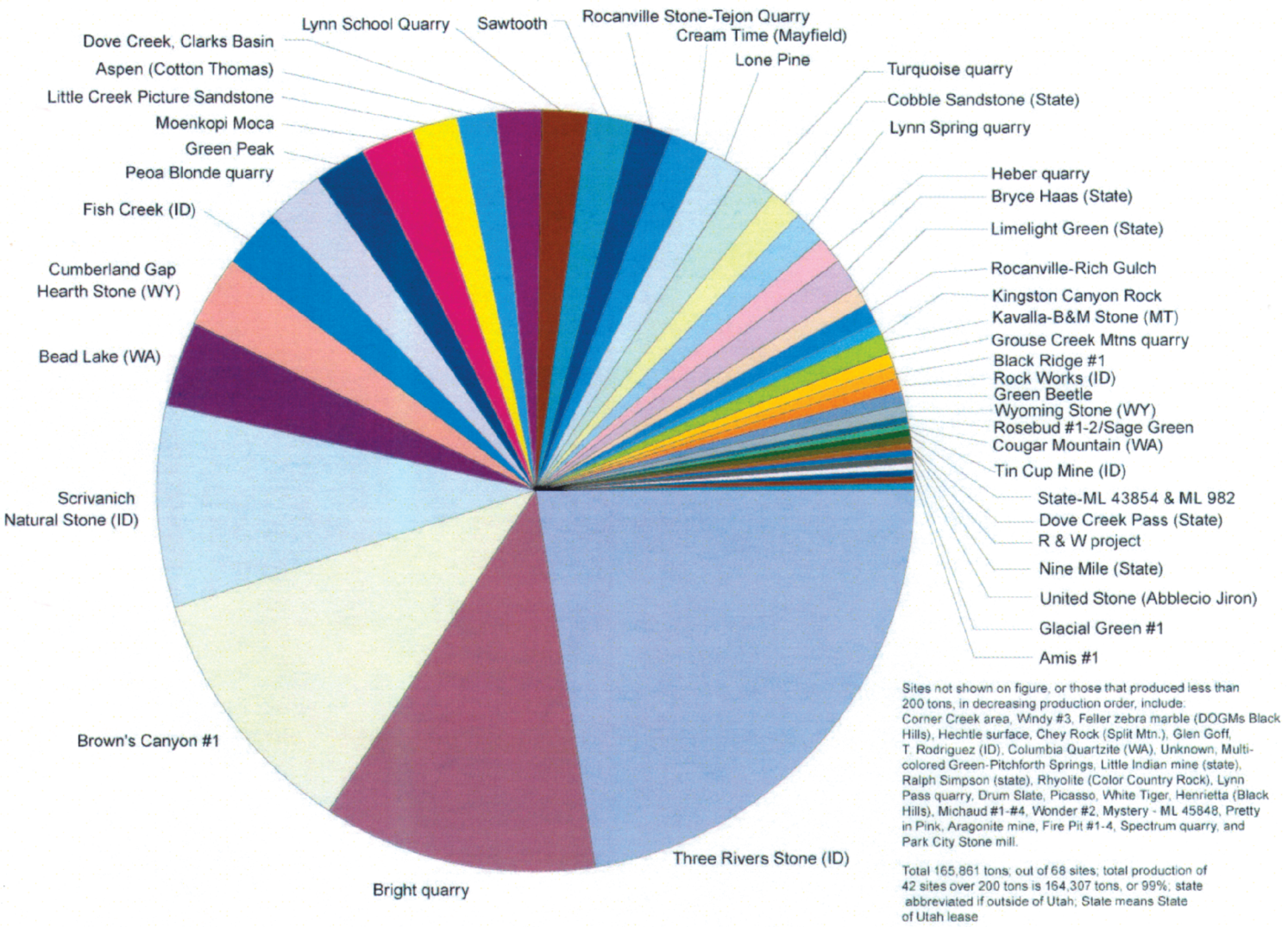


Figure 5. *Graph showing production of building stone quarries producing 200 tons or more in 2004.*

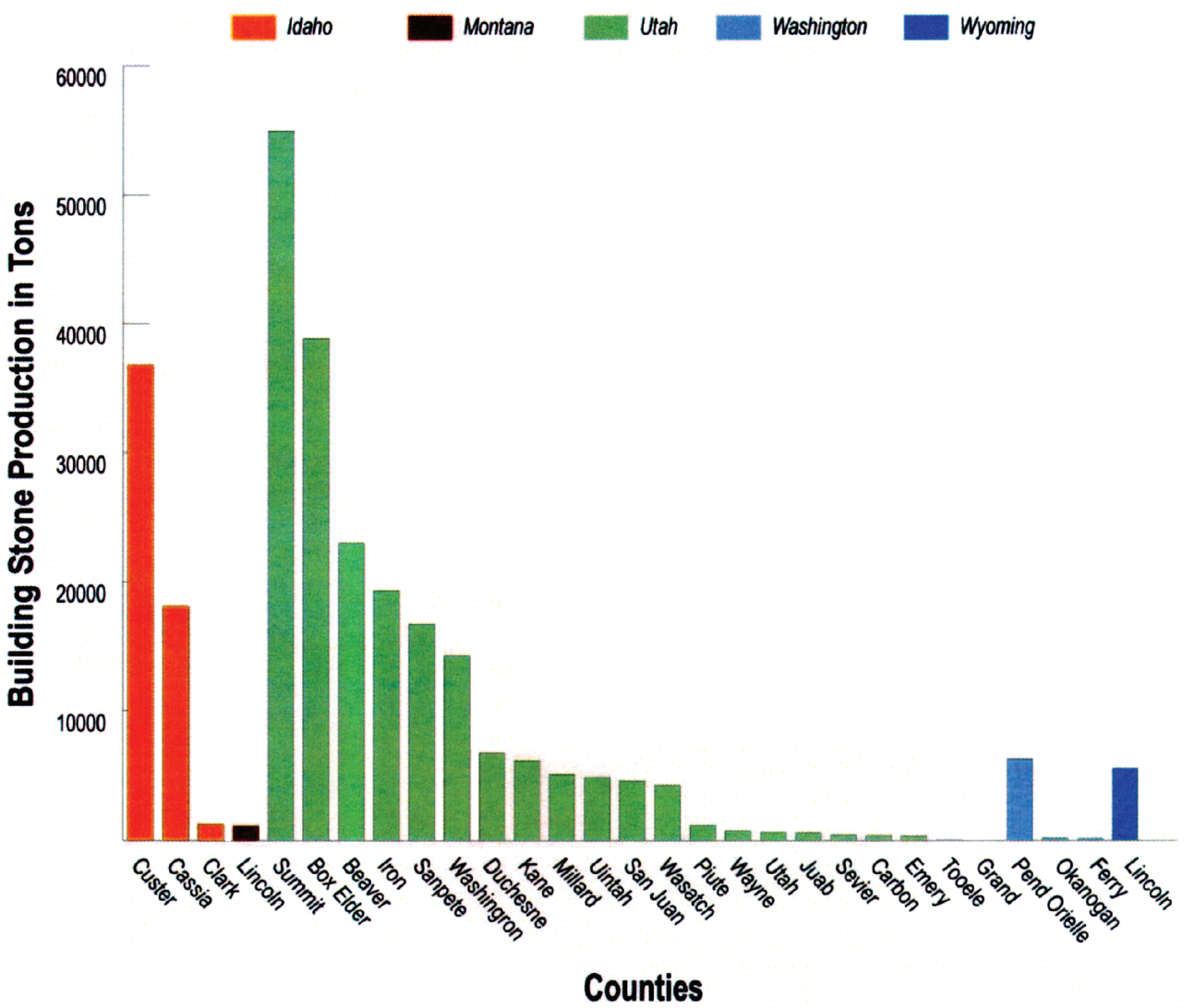


Figure 6. *Graph showing rank of peak production of building stone by state and county for the study area. Based on maximum production, in tons, for any year from 1995 to 2004. Maximum production equals 272,000 tons. Data presented is incomplete outside of Utah.*

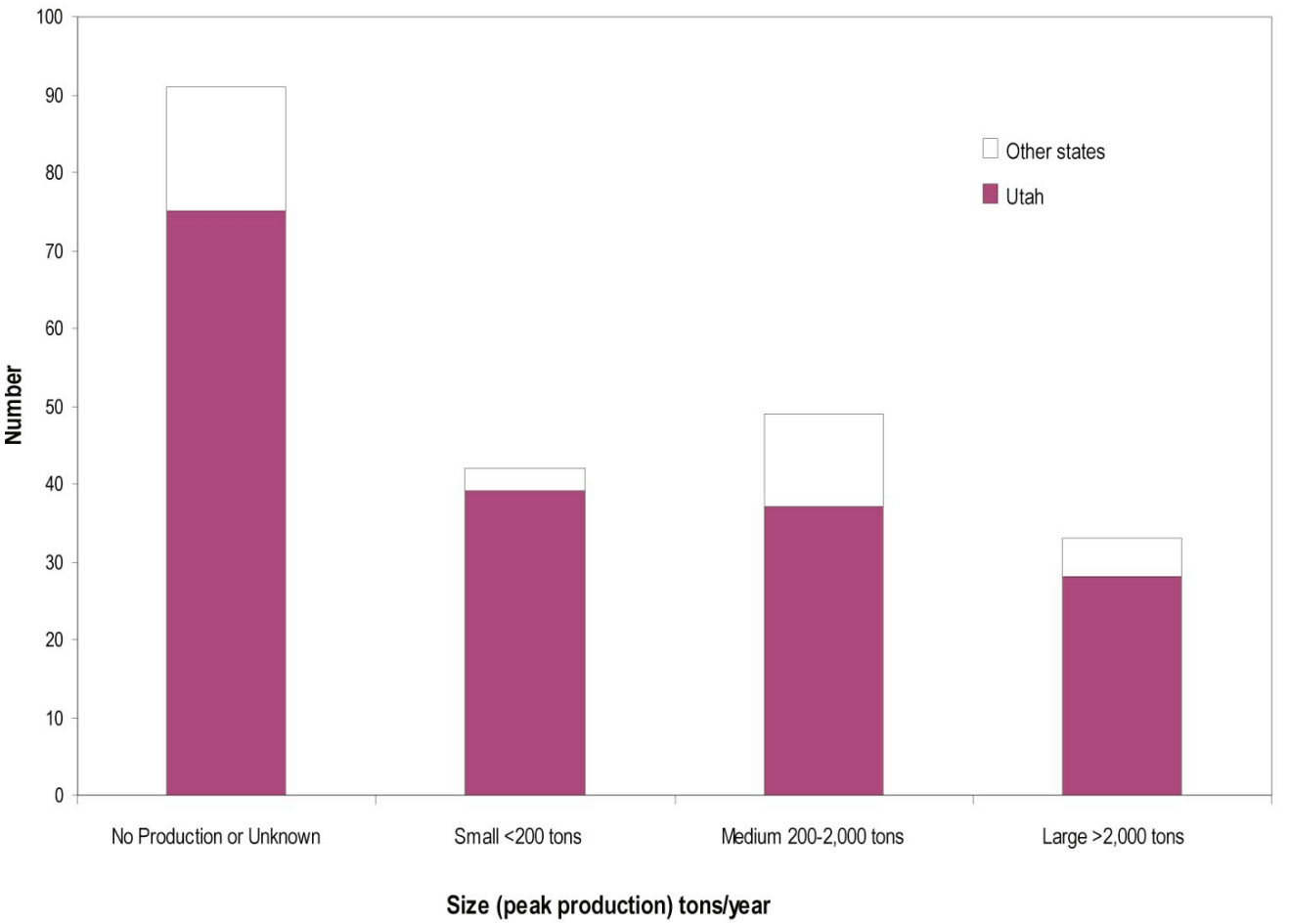


Figure 7. *Number of building stone operations by peak production. Size is based on maximum (peak) production year during 1995-2004. Also shown on map (figure 8).*

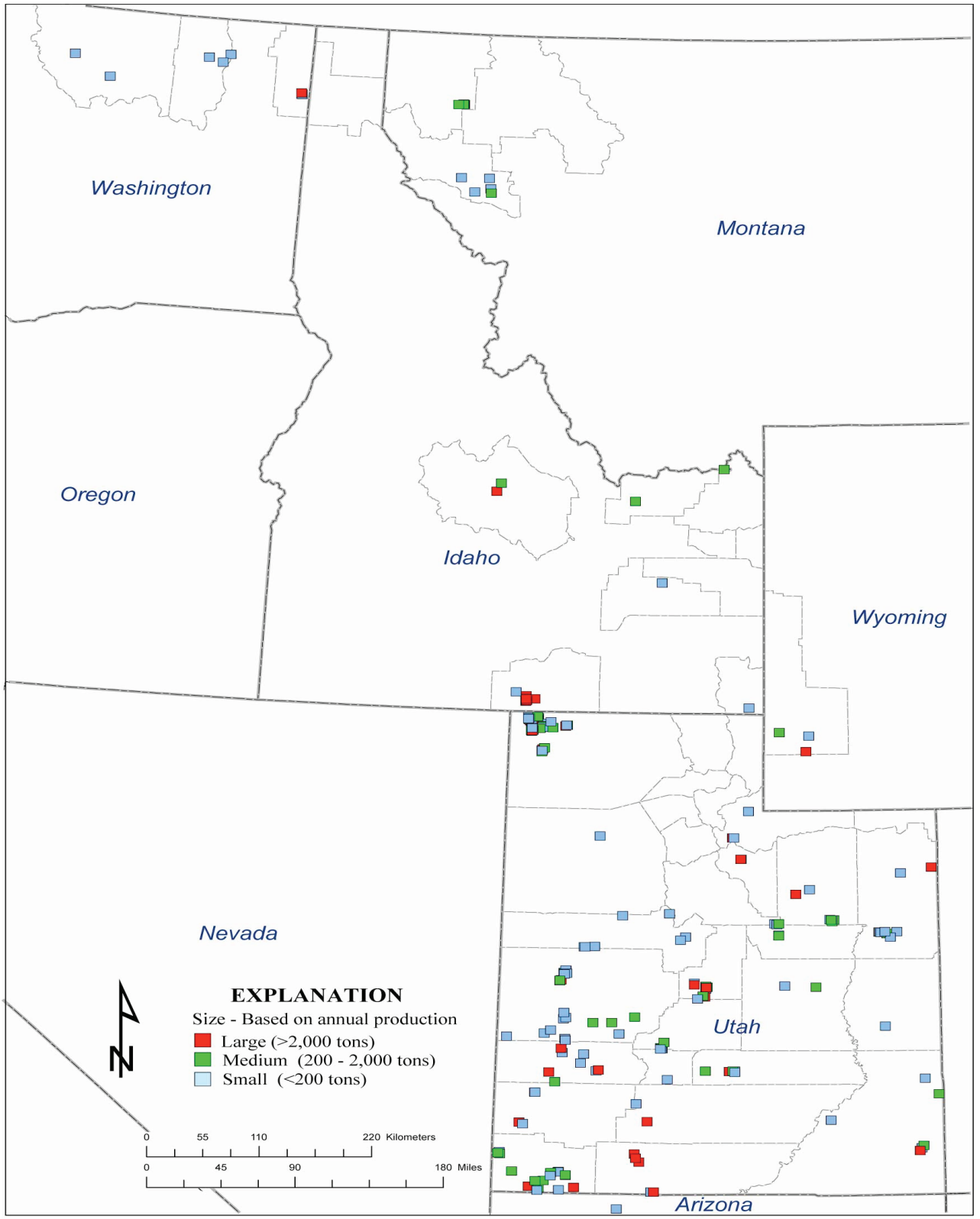


Figure 8. *Map showing size of operations by production.*

in this study. These categories of case type are (1) common use area, community pit, or material site; (2) mining claims, and (3) private and state lands. These categories are charted by size and case type in figure 9, and again located on a map for Utah in figure 10. Those operations with no production (or no data) are the largest category. Operations found on state or privately-held lands contain the largest number of quarries in each size group, followed by operations found on mining claims, while the fewest sites are located at material sale, common use, and community pits.

In examining operations by case type and ownership, the largest producers on privately-held lands are from four operations located in Browns Canyon, a few miles east of Park City in Summit County, Utah. Other large operations on State of Utah leases are Bruce Haas' operations, located south of Vernal, and the Moenkopi Moca pit, operated by Hansen Stone Quarries 15 mi east of Kanab. The Vernal BLM FO areas has the largest number of operations listed as material sites, while the Salt Lake and Fillmore BLM FO areas manage the largest number of quarry operations held by mining claims. The largest material site is the Bright quarry, east of Cedar City, which mines and crushes multi-colored rhyolite for landscape aggregate.

Geology and Availability of Stone Materials

Rock Type

Materials identified in quarries are divided by rock type and geologic unit (or formation) in the inventory. The most commonly quarried rock types by number of sites are, in decreasing order, quartzite, sandstone, limestone (including travertine), argillite, rhyolite, shale, granite (includes gneiss and granodiorite), marble, and others (figure 11a). Quartzite and sandstone are the two most common rock types quarried in Utah. Sandstone quarries are located mainly in eastern and southern Utah (figure 11b, map), and quartzite is quarried in northwestern Box Elder County, Utah, and Cassia County, Idaho. The other quarried rock types include limestone, marble, shale, and various volcanic rocks that are most commonly found in western Utah.

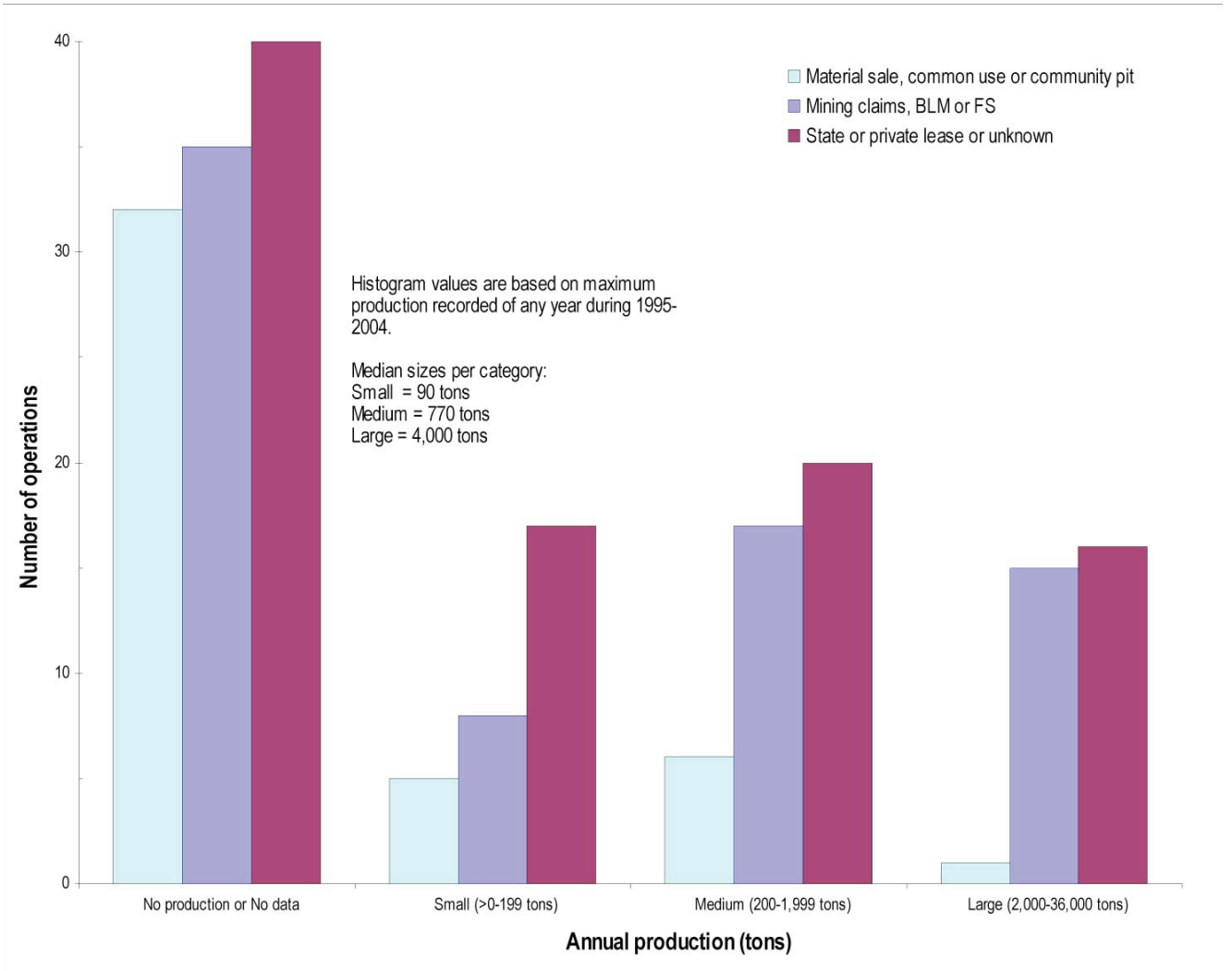


Figure 9. *Number of building stone operations by size and case type.*

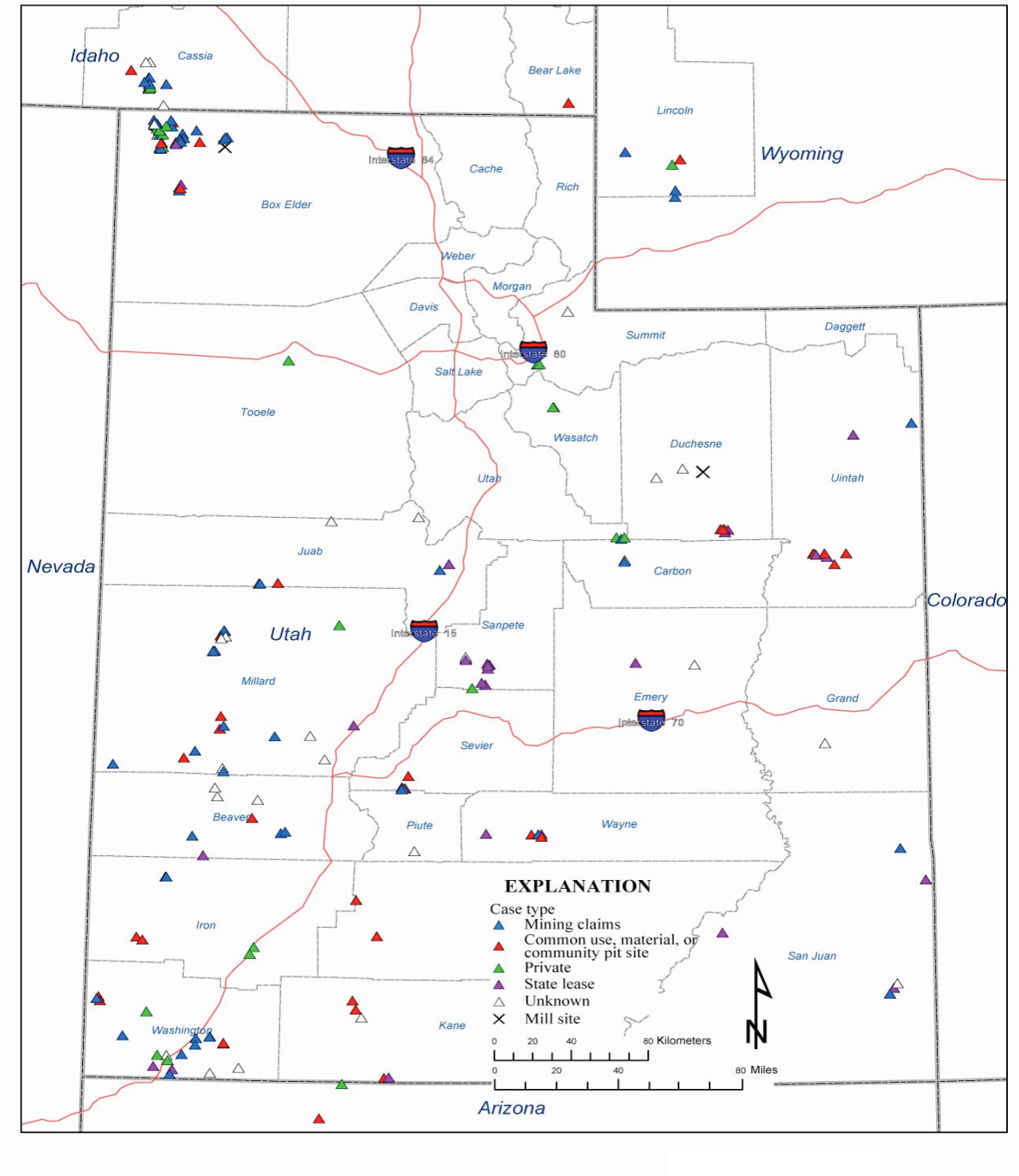


Figure 10. *Map showing case types for operations.*

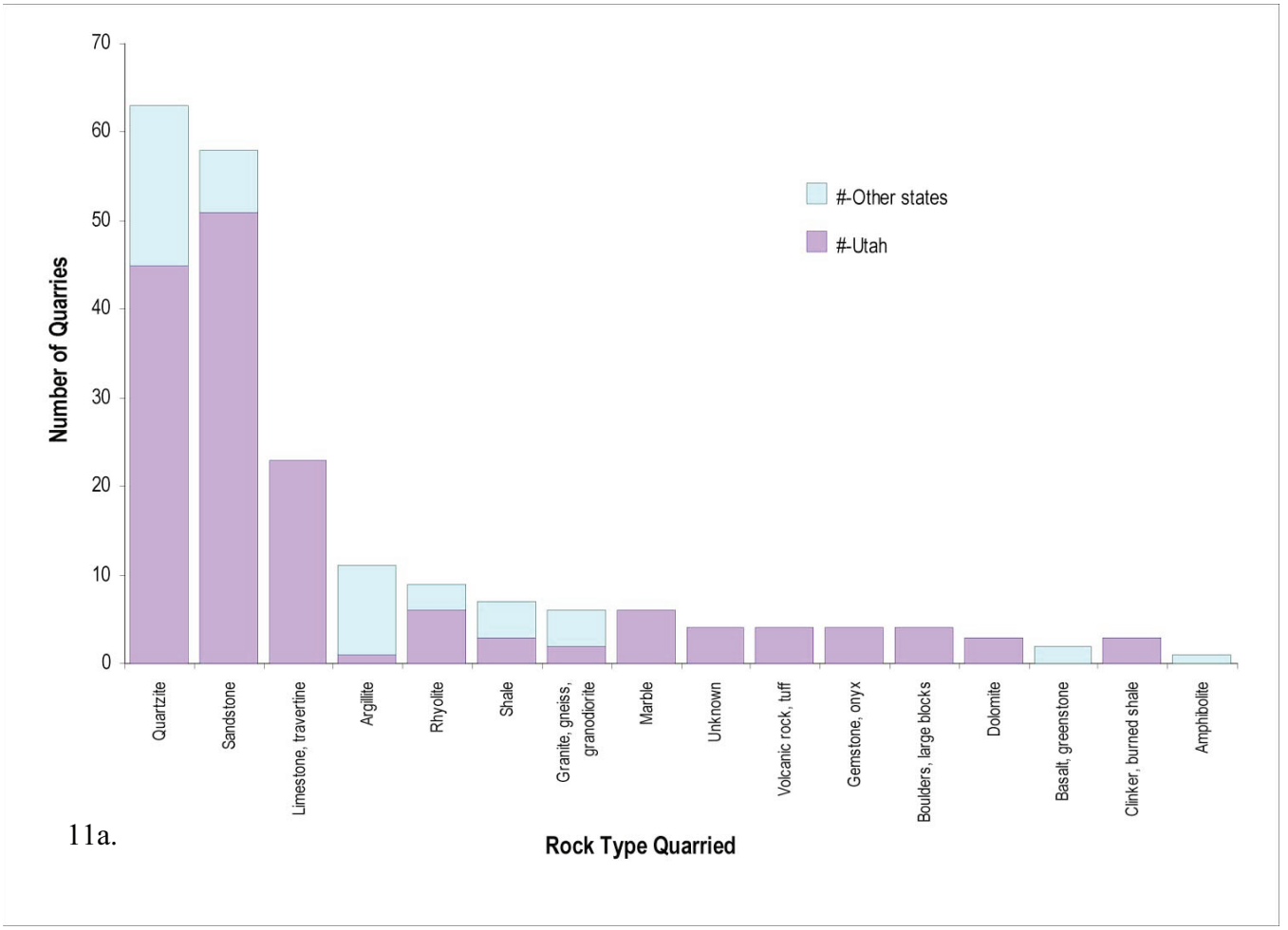


Figure 11a. *Histogram shows the relative abundance of rock type quarried in Utah and in other states.*

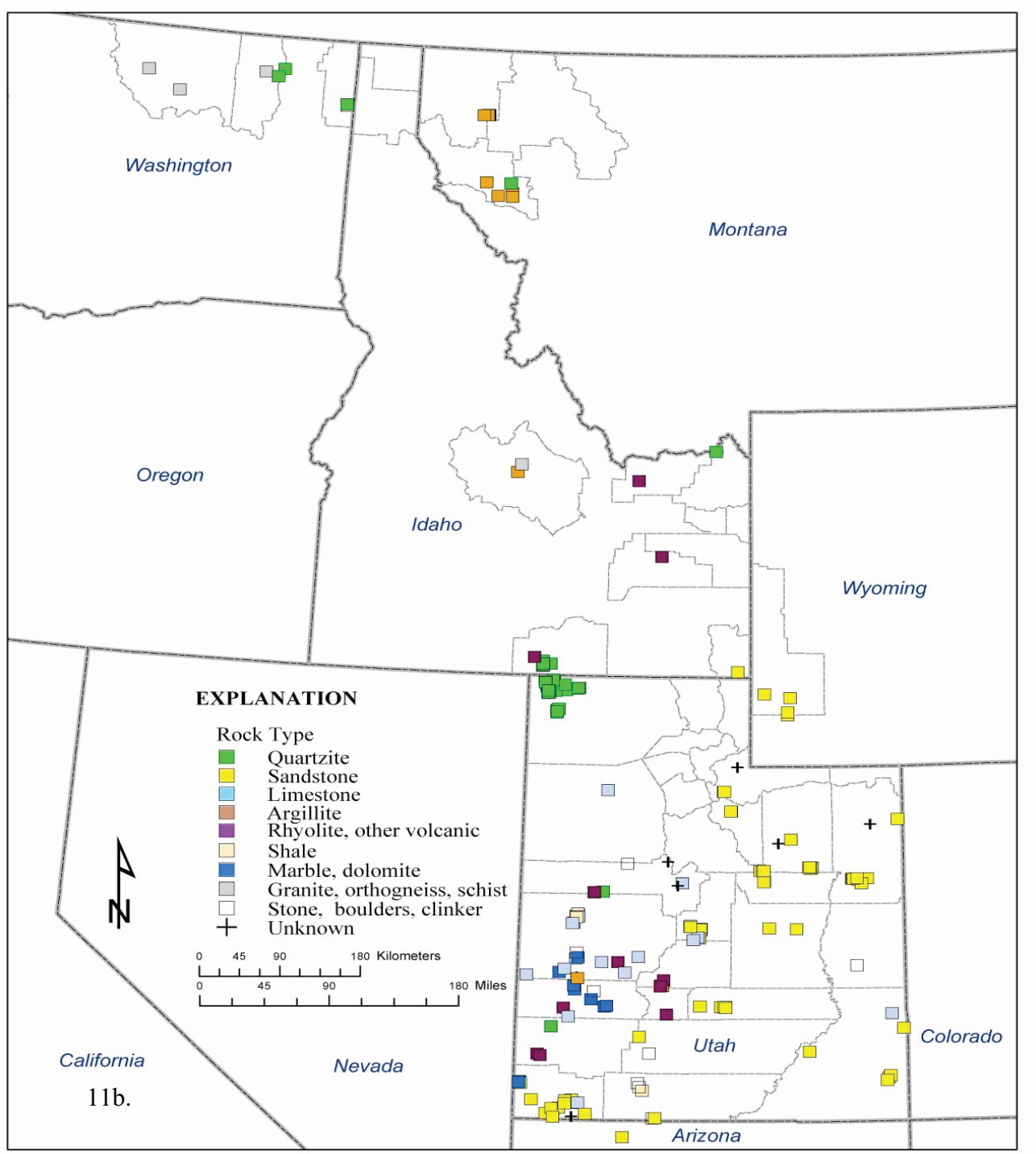
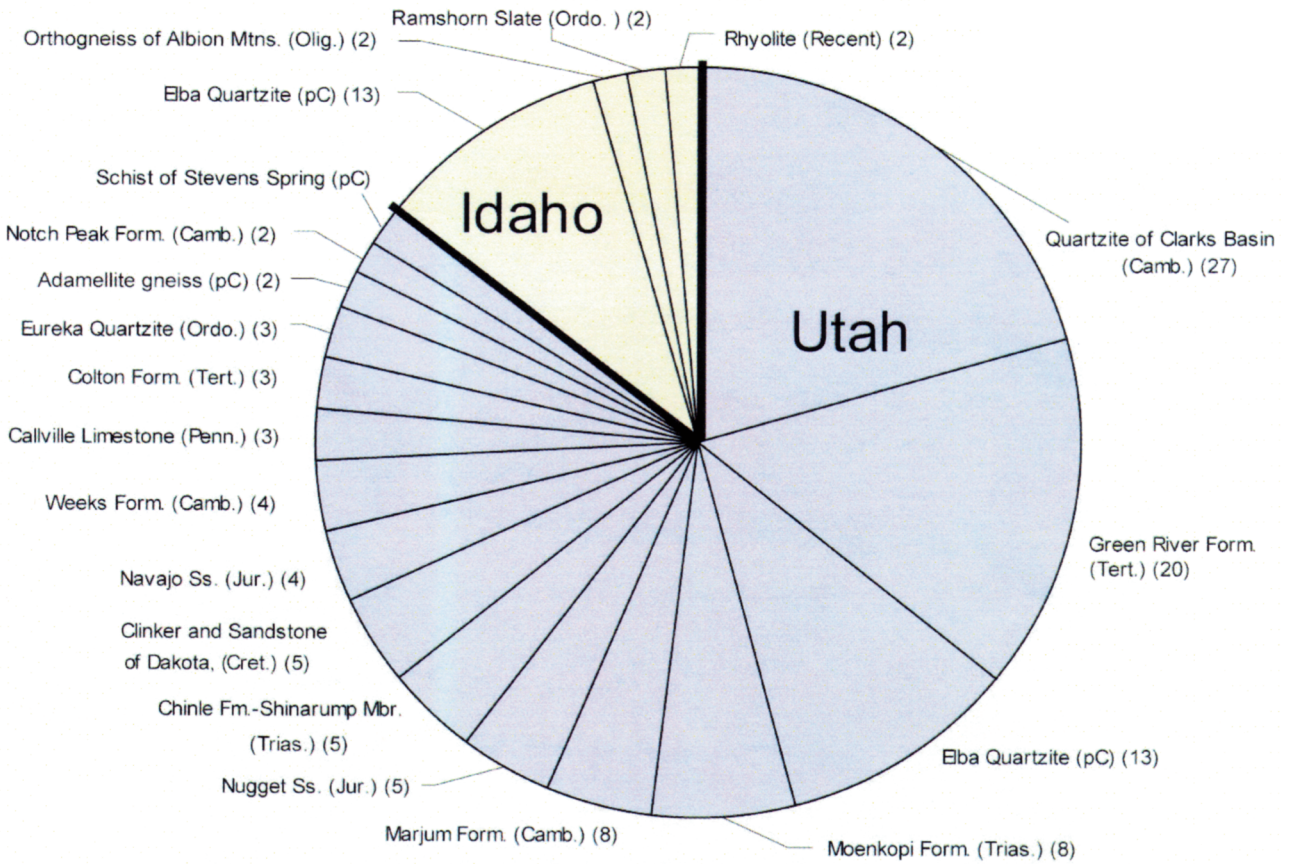


Figure 11b. *Map shows the distribution of the most common rock types quarried. "Stone" means rock type is unknown.*

Formation

The Quartzite of Clarks Basin, Elba Quartzite, Green River Formation, and Nugget/Navajo Sandstones are the most common geologic units (formation) quarried in Utah and Idaho (figure 12a). Quartzite of Clarks Basin is found at 27 quarries, the Elba Quartzite is present at 23 quarries, the Green River Formation, either from a sandstone or limestone member, is present at 20 quarries and the Nugget/Navajo is present at ten quarries. Quarries containing the Quartzite of Clarks Basin and Elba Quartzite are concentrated in the northwestern part of Utah and adjacent Cassia County of southern Idaho; the Green River Formation is the main host rock at quarries located in the eastern and central parts of Utah. The Moenkopi Formation is present in eight quarries which are distributed across southwestern Utah and northern Arizona (figure 12b).

Two Utah regions containing extensive quarried stone are examined more closely to emphasize the widespread extent of the resource and the variety of stone present. The two areas are: (1) Northwestern Box Elder County, and adjacent Cassia County, Idaho that contain Precambrian-Cambrian quartzite flagstone, schist, and gneissic strata and (2) southern Utah area that contains sandstone or limestone strata quarried from the Triassic Moenkopi Formation.



Geologic Unit	#
Quartzite of Clarks Basin	27
Elba Quartzite	26
Green River Fm.	20
Nugget / Navajo Sandstone	10
Moenkopi Fm.	8
Marjum Fm.	6
Shinarump Mbr. of Chinle Fm.	5

Figure 12a. *The pie chart shows those geologic units found at quarries in Idaho and Utah in decreasing order of abundance. The table tallies the seven most common geologic units.*

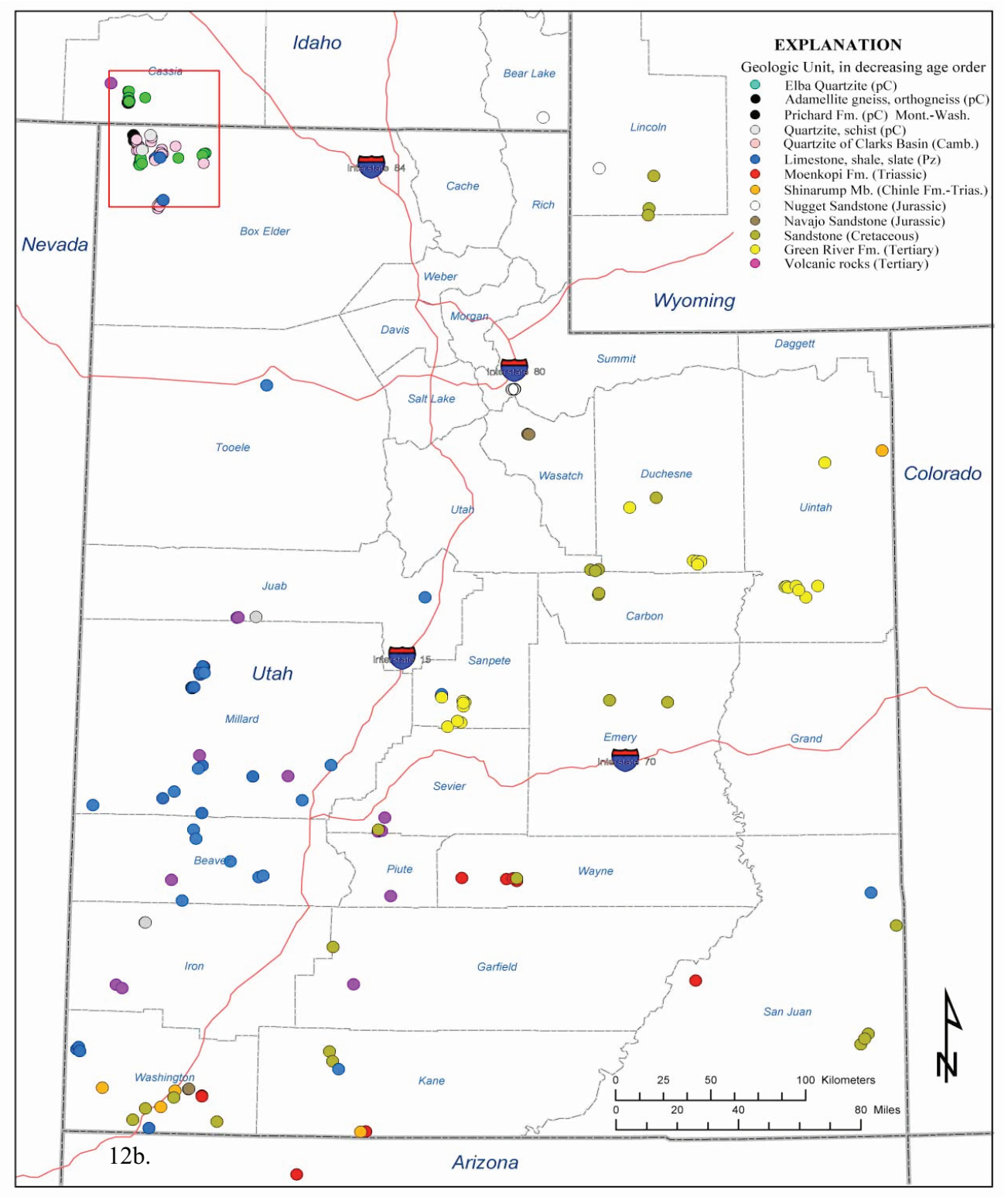


Figure 12b. *Map showing the distribution of geologic units found in quarries in Utah and part of Idaho. Detail area (red rectangle) is shown in figure 13a, b.*

Elba Quartzite

The area containing a high concentration of quarries is in northwestern Box Elder County, Utah and southern Cassia County in Idaho. Fifty-five quarries and six yards are located in this area (identified by italized typeface on table 2). Quartzite is the predominant rock type quarried throughout the area quarries. Granite (orthogneiss) is quarried at four quarries and rhyolite at one quarry (figure 13a). This area is shown on plate 2.

The general geological map (Doelling, 1980; Hintze and others, 2000) shows the relative distribution of geologic map units on figure 13b of the Quartzite of Clarks Basin and the Elba Quartzite, the most important geologic units present at quarries. Units of lesser importance include Quartzite of Yost, Eureka Quartzite, gneisses, rhyolite, and unnamed Precambrian quartzite. The Elba Quartzite is a sub-unit within the Precambrian Z3 (PCz3) sedimentary map unit, and its areal extent is shown by the heavy red outline on figure 13b.

Quarrying operations in Box Elder-Cassia Counties include four at community pits, two at material sites, 31 at mining claims, two on state lands, 18 on private lands, and four lands of unknown ownerships. This number includes four wholesale yards and two retail yards that carry product for several enterprises, including Bonneville Quarries, Sawtooth Stone, Northern Stone Supply, Scrivanich Natural Stone, and Oakley Valley Stone. Production of stone from this area in 2004 was 51,466 short tons based upon actual and estimated production from 20 of 55 operations.

This discussion focuses on the Elba Quartzite for two reasons. The Elba is one of the two most important rock units quarried in the State of Utah. Evidence is also presented to show that the Elba-like pale green coloration is widespread. Quarry operators claim that the pale green color is highly unique and limited to the square mile between the Turquoise and Fisher Creek quarries on the south side of the Raft River Range of Box Elder County, Utah. Both structural geology and stratigraphic evidence are reviewed.

The Elba Quartzite, a brown, white, or pale green micaceous quartzite, is desirable due to its pale green coloration or its occasional flaggy nature, or both features, when present. It is one of the most widespread units in the Cassia County, Idaho-Box Elder County, Utah area (Doelling, 1980; Compton, 1975) (figure 13b) and exhibits a distinctive pale green coloration imparted by the presence of a chromium-bearing mica mineral called fuchsite .

Three quarries in the area containing green coloration are the Turquoise quarry (figure 14a, b), Glacial Green quarry (figure 14c, d) and Fisher Creek prospect (figure 15a). These quarries develop only a small segment of the overall thickness of the Elba Quartzite containing the green coloration shown by the strata bracketed in figure 15a. Flaggy quartzite strata are exploited for their laminated or schistose characteristic which makes them amenable to splitting into layers of one to six inches in thickness and for their coloration. Quartzite that readily splits into thin flagstone sheets along micaceous partings and the presence of the pale-green coloration are not areally coincident but somewhat favored characteristics and finding these characteristics together requires some exploration. However, thin flagstone sheets usually do not coincide at the quarries containing the pale green coloration; instead the stone having the pale green coloration consists of blocks and slabs, some of random thicknesses and sizes that are four inches or more in thickness.

The Elba Quartzite is within a sequence of several Precambrian and Lowermost Cambrian quartzite and gneissic units present throughout the Raft River and Grouse Creek Mountains of northwestern Utah (table 3). Elba strata are thought to extend northward into mountain ranges of Middle Mountain and Albion Mountains of Cassia County, Idaho, where they are also exploited as flagstone resources. Detail geologic mapping has been completed in Box Elder County, Utah (Doelling, 1980; Compton, 1972, 1975), but reconnaissance mapping completed in adjacent Cassia County, Idaho, shows that not all strata present in the Raft River Range extend northward into the nearby Albion Mountains. Similar rocks also extend from the Grouse Creek Mountains of Utah northward into Middle Mountain of Cassia County (Armstrong and others, 1978).

The pale green coloration within the Elba Quartzite occupies a 400 ft-thick portion of the Elba Quartzite formation. The Elba has an overall thickness of 1220-1500 ft in the Raft River Range. The Raft River Range has formed as a broad, east-west-elongated structural uplifted arch and the Elba strata are exposed along the top of this arch as shown in figure 15a. The arching shape of the outcropping Elba Quartzite is responsible for exposures of the strata containing the pale green coloration at the Turquoise, Fisher Creek, and Glacial Green quarries, where the stone is exploited. One only need follow the arching outcrop pattern of the pale green strata to the north, east, or west along the top of the south and central parts of the range to discover many other untapped deposits like those at Turquoise, Glacial Green, and Fisher Creek quarries.

Pale green, mica-bearing quartzite also occurs in units other than the Elba Quartzite (Doelling, 1980). Doelling (1980) lists at least two formations elsewhere in northern Utah where the pale green coloration is also found, including the Quartzite of Yost and the Maple Canyon Formation found in the West Hills and Wasatch Range of the hinge line zone. Anderson (1931) notes that Precambrian quartzite or schist strata of Cassia County also contain green micas that resemble the green coloration of the Elba Quartzite of Box Elder County. A pale green coloration is also found at locations within the western Raft River Range within a quartzite of the Schist of Stevens Spring at the Johnson Creek quarry (figure 15b, c) and in the Quartzite of Clarks Basin at Pine Spring quarry, located (not pictured) north of the crest of the Raft River Range.

Elba strata containing the pale green coloration has not been found in quarries located to the west in the southern Grouse Creek Mountains or south of Dove Creek Pass, although other units of the Elba Quartzite are found there. Strata of the Elba Quartzite outside of the Raft River Range at the Kimbell Creek area in the southern Grouse Creek Mountains also lack the pale green coloring and consist entirely of medium- or light-brown colored quartzite (figure 16).

Moenkopi Formation

The Moenkopi Formation is present throughout southern Utah. It is underlain by the Permian Kaibab Limestone in central Utah or Plympton Formation in southwestern Utah, and overlain by the Triassic Chinle Formation. It reaches an

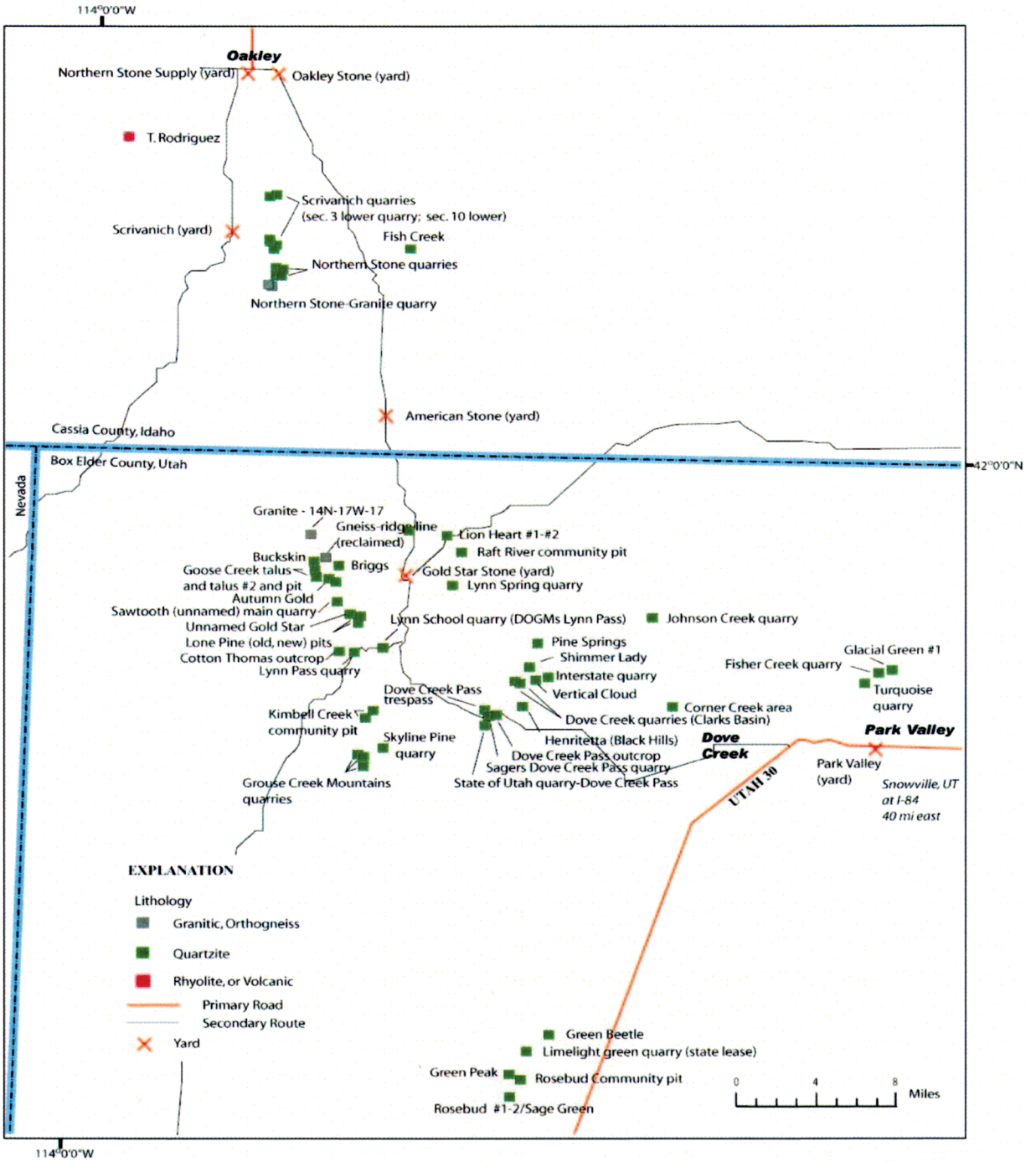


Figure 13a. *Map showing rock types and geologic units found in rock quarries of Cassia County, Idaho and Box Elder County, Utah. See location on figure 12a (red outline).*

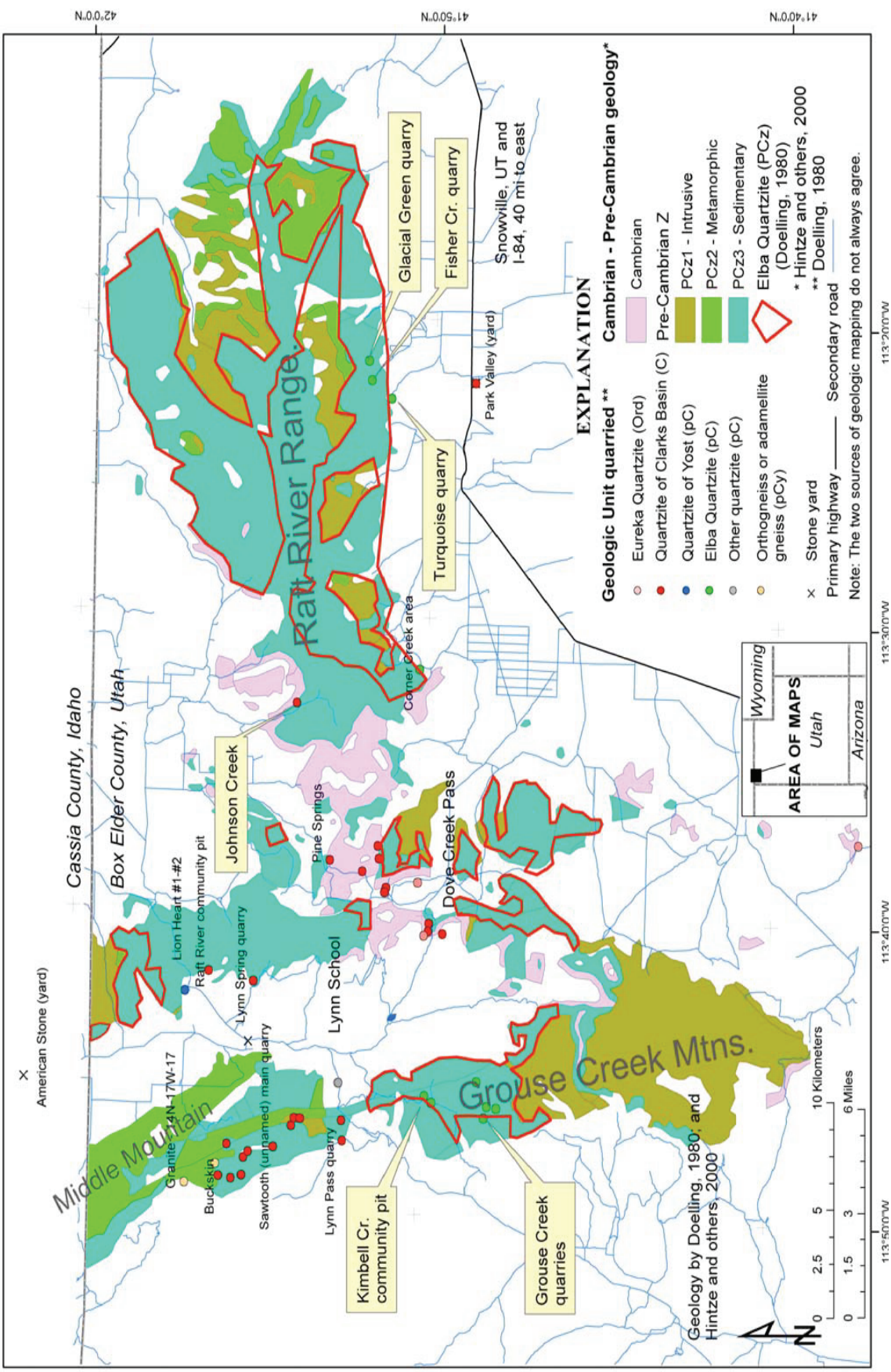


Figure 13b. Map showing area geology and geologic units identified in quarries in part of Box Elder County, Utah.

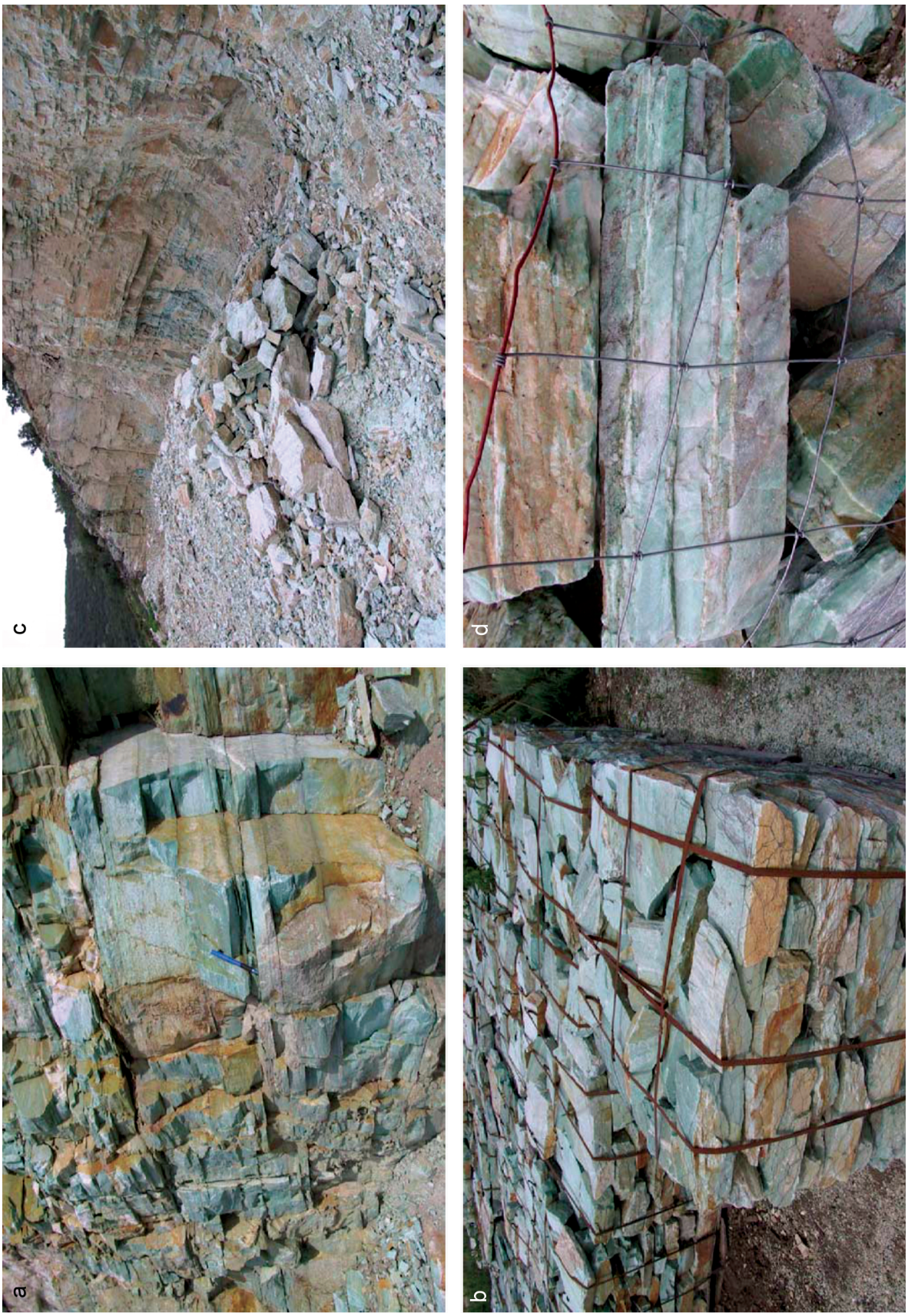


Figure 14. *Elba Quartzite in the Turquoise (a, b) and Glacial Green (c, d) quarries, Box Elder County, Utah. Photos courtesy of Northern Stone Supply County, and Feller Stone Inc.*

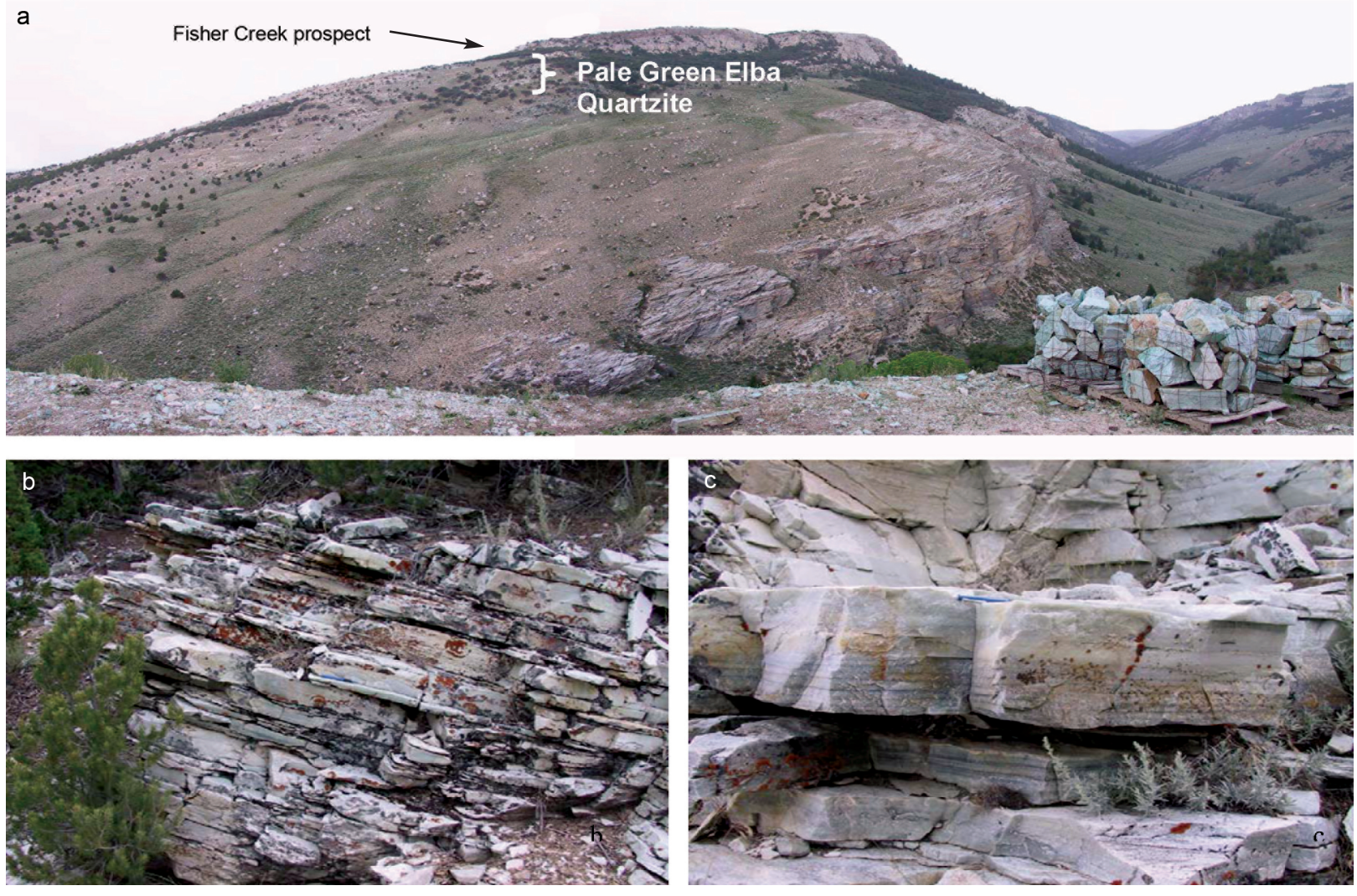


Figure 15. *Fisher Creek prospect (a, as viewed from the Glacial Green Quarry) in the Elba Quartzite is in distance. Johnson Creek Quarry in Schist of Stevens Spring (b, c) in Box Elder County, Utah. Bracketed strata in (a) show a part of the strata containing pale green coloration. The Stevens Spring in (b,c) shows the same distinctive light green coloration as the Elba Quartzite due to presence of chromium mica. Pencil for scale. Photos courtesy of Feller Stone Co.*

Table 3. *Stratigraphy of Lower Cambrian and Precambrian rocks of northwest Box Elder County.*

Eon or Period		N. Grouse Creek Mtns.; Raft River Range¥ (thickness)		S. Grouse Creek Mtns.¥ (thickness)	
Lower Cambrian		*Faulted, not deposited, or not exposed*			
		Schist of Mahogany Peaks	(50-300 ft)	Schist of Mahogany Peaks	(0-100 ft)
		Quartzite of Clarks Basin	(400 ft)*	Quartzite of Clarks Basin	(600 ft)
Proterozoic	Late	Schist of Stevens Spring	(500-600 ft)	Schist of Stevens Srping	(525 ft)
		Quartzite of Yost	(400 ft)* †		
		Schist of Upper Narrows	(600-1500 ft)		
		Elba Quartzite (600-1500 ft)* †	Green quartzite	Elba Quartzite	(100 ft)*
			Mica-feldspar schist		
	Early-Middle	*Faulted, not deposited, or not exposed*			
		Older schist	(300 ft)	Older schist	(1500 ft)
		Adamellite*		Adamellite	

* indicates unit is exploited for flagstone resource
† indicates a part of unit is pale green quartzite due to presence of chromium-bearing mica
¥ Geology by Doelling (1980), Hintze (1988), and Compton (1975)
Dashed line indicates an unconformity between rock units

average thickness of 1000 ft (Hintze, 1988) along its eroded western edge at the Utah Hingeline. It consists of four members in central Utah and five members in southwestern Utah (Stokes, 1986) (table 4). The members consist mainly of sandy shale with minor limestone throughout and with its sand content increasing to the north and west. The formation is missing in northern Utah with exception of scattered outcrops. Figure 17 shows the outcrop pattern of the Moenkopi and the locations of stone quarries discussed here.

Stone from the Moenkopi Formation is seeing increasing demand as an important source of stone because of its reddish brown color and strength (e.g. at the Gateway shopping mall in Salt Lake City). It provides a source of large sandstone blocks for landscape use and as raw material source for fashioning of dimension stone, and as source of thin flagstone slabs. Several quarrying operations in the Moenkopi Formation are developed at material sites, community pits, and located claims. American Stone extracts flagstone blocks and patio stone from claims located near Torrey, Utah (figure 18a, b). Blocks of mainly sandstone are removed from BLM community pits located at Capitol Reef near Torrey (figure 18c, d), and the Bitter Seep community pit quarry located south of Kanab in Mohave County, Arizona (figure 19c, d). Stone from the Moenkopi is removed as large blocks of massive sandstone at the Quality Stone material site (figure 19a, b) near Torrey, Utah, and as a flaggy limestone at Limestone Mesa material site (figure 20a, b) and Virgin community pit (figure 20c, d) northeast of St. George. The Virgin Limestone Member, of a light brown color, is quarried at the Limestone Mesa pit and Virgin community pit. The Moenkopi is also exploited at the Moenkopi Hite, Moenkopi Moca, and the Torrey Buff quarries.

Stone and Quarry Characteristics

Wide variations are noted in the characteristics of both the stone available from and the mining operations conducted at quarries. Dealers, current and potential operators, and other readers want a more detailed description of the stone to properly evaluate the available choices of stone. The characteristics assembled below provide a subjective estimation method that addresses variations in quality of stone and the setting of the quarry site. These factors do not include physical data that may be available through American Society for Testing Materials (ASTM International) standard testing, which is beyond the scope of this report. These factors have not been placed on any map as in previous sections of this report. As applied by SubTerra (2004), the characteristics listed for each site and tabulated in the spreadsheet, Stone_sites.xls, evaluate: (1) the rock at the site, (2) the geologic and topographic setting, (3) the manner in which the quarry is operated, and (4) a combination of these related factors. The purpose is to compile the relative predominance of these factors that permit comparison across the study area between stone extracted from quarries and the mining practices at quarries. Five characteristics (list below) are recorded about the stone removed from the site, and six characteristics are recorded about the quarry operations. Due to the inherent interrelationships, these characteristics are not independent of one another. For example, size of the deposit is related to the extent of the deposit and may be related to the ease of extraction; in turn, ease of extraction may be related to the presence and orientation of fracture and cleavage. All characteristics may not be applicable to every quarry, and characteristics were not compiled for quarries not visited.

Figure 16. *South Grouse Creek Mountains quarry (a, b) and Kimbell Creek community pit in Elba Quartzite (c, d). Both are developed in the Elba Quartzite located in the southern Grouse Creek Mountains.*

Table 4. *Stratigraphic column of Moenkopi Formation in Utah.*

San Rafael Swell area of Central Utah			St. George area of southwest Utah		
Formation	**Member**	**(thickness)**	**Formation**	**Member**	**(thickness)**
Moenkopi (Triassic)	Moody Canyon	(320 ft)	Moenkopi (Triassic)	Upper Red	(404 ft)
	Torrey	(255 ft)		Shnabkaib	(727 ft)
	Sinbad Ls.			Middle Red	(333 ft)
	Black Dragon	(180 ft)		Virgin Ls.	
				Lower Red	(229 ft)

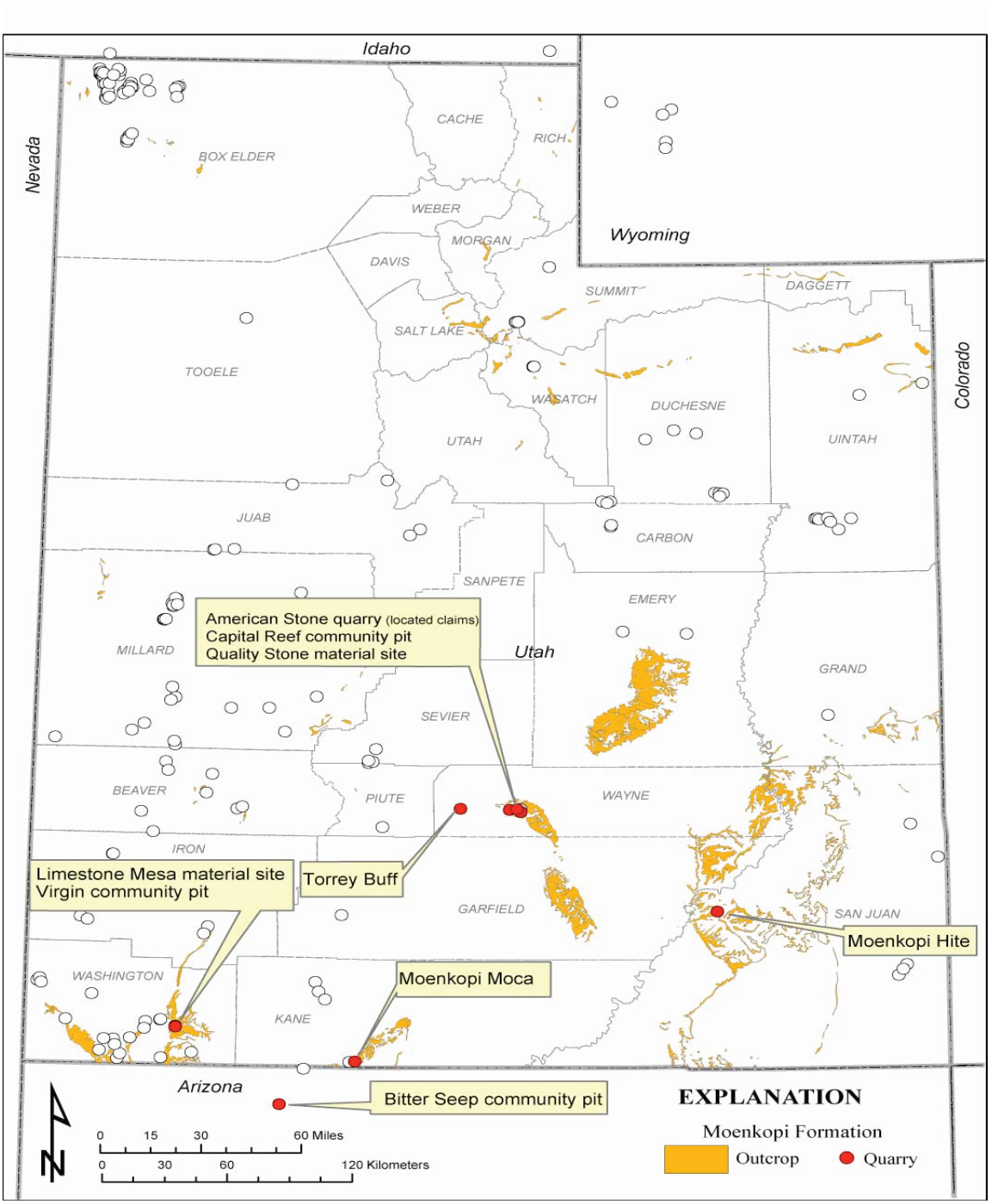


Figure 17. *Map showing distribution of some quarries in southern Utah and northern Arizona where stone is removed from the Moenkopi Formation. Geology of the Moenkopi Formation is after Hintze and others (2000).*

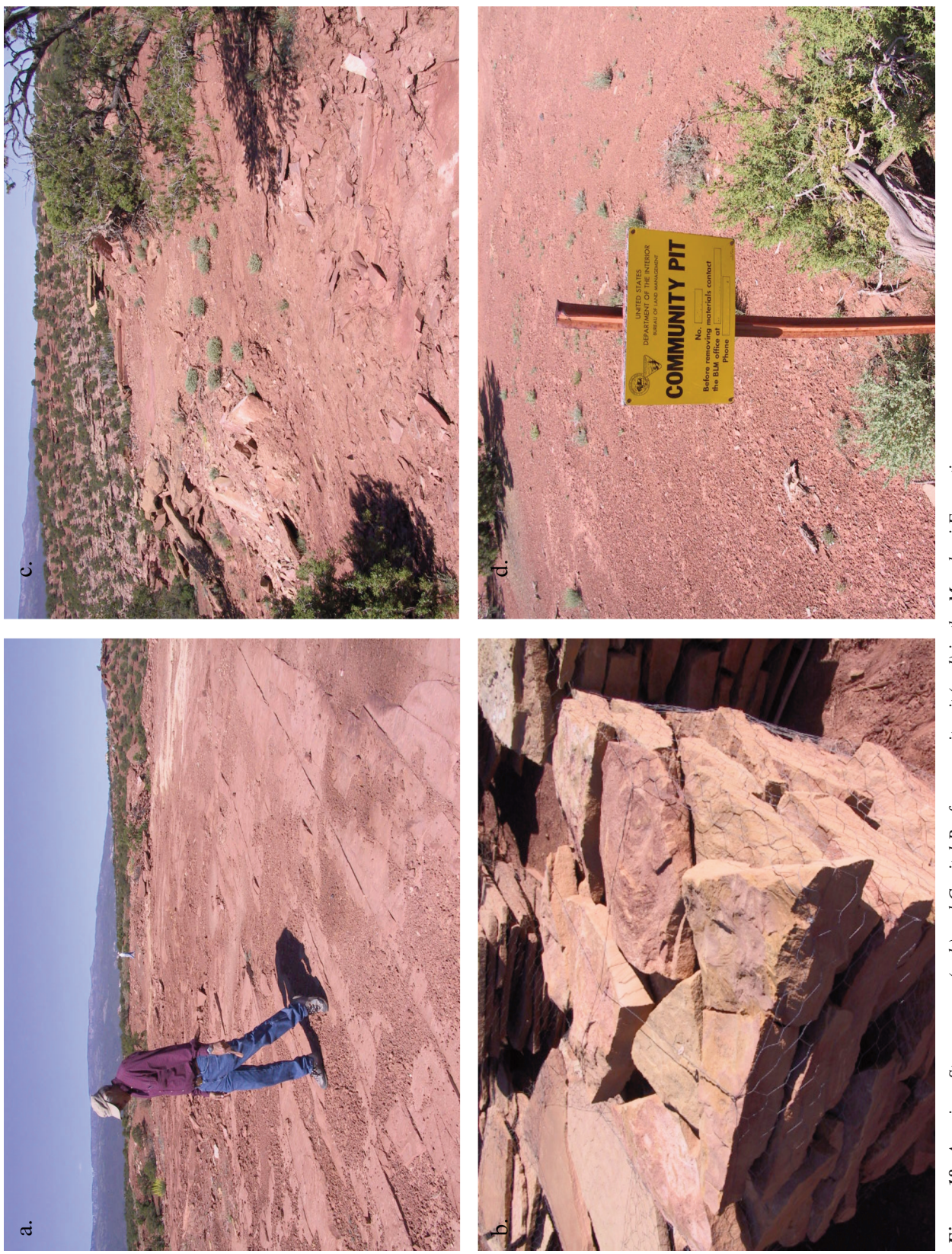


Figure 18. *American Stone quarry (a, b) and Capitol Reef community pit (c, d) in the Moenkopi Formation.*

Figure 19. *Quality Stone material site (a, b) in Torrey, Utah area and Bitter Seep community pit (c, d) south of Kanab, Utah in Mohave County, Arizona. Stone is removed from the Moenkopi Formation. Photos courtesy of Quality Stone.*

Figure 20. *Limestone Mesa material site (a, b) and Virgin community pit (c, d) located northeast of St. George in Washington County, Utah, where stone is quarried from the Moenkopi Formation.*

Stone characteristics:

1. Color
2. Geology
3. Rock type (Lithologic Description and Other Characteristics in spreadsheet)
4. Effect of fractures and cleavability upon (a) extraction and (b) product dimensions
5. Influence of texture on marketable product
6. Uniform product thickness
7. Lithology, hardness, and durability
8. Rock quality and suitability

Quarry characteristics:

9. Size
10. Ease of extraction
11. Extent of deposit
12. Reserve limits and overburden
13. Number of products
14. Known products

Categorical definitions for each of the characteristics are provided in the following paragraphs, along with comments that may be specific to different quarries. Color (1) is self-explanatory. Geology (2), rock type (3) lithologic description, and size (9) were discussed earlier in this report. Other columns in the spreadsheet, Generalized_Geology, and Generalized_Lithology, are geologic in nature and used for geographic information systems (GIS) purposes.

Effect of Fractures and Rock Cleavage Upon (a) Extraction and (b) Product Dimensions

This characteristic was sub-divided into sub-categories of Extraction and Product Dimension to account for the distinctly different contributions that rock fracture and cleavage impart upon mining conditions and the dimensions of the product. Sub-categories were assigned, and the number of quarries, with respect to extraction under these conditions includes:

Category	Number
Favorable	14
Unfavorable	12
Not applicable	33

Sub-categories with respect to product dimensions and the number of quarries under these conditions include:

Category	Number
Favorable	101
Unfavorable	35
Not applicable	16

Viewed from quarrying considerations, rock fracture and cleavage habits directly influence the ease of extraction. The nature of the rock fracture and cleavage may also indirectly or directly affect the production capacity (size) of the operation.

Viewed from the standpoint of product dimensions, fracture and cleavage of rock can have a strong influence on the type, number, and the thickness uniformity of products. These, in turn, can have an effect on the production capacity (size) of the operation. Quarry operations at which fracture and cleavage conditions were determined to be favorable include American Stone, Bead Lake, Cumberland Gap Hearth Stone, and others. Usually, these two characteristics are coincident, that is, both are either favorable or unfavorable. In some instances, these two characteristics can be competing, that is, favorable relative to extraction but unfavorable with respect to product dimensions. Examples of this are found at Drum Slate, Glacial Green, Green Peak, Granite Quarry, and Pine Springs quarries. Whether these factors are competing or coincident has a direct impact on the market considerations. Where a favorable rating is present for both considerations, the fracture and cleavage habits have the most positive impact on potential profits, and operations are most viable; where a negative rating applies to both, the opposite is true.

Influence of Texture on Marketable Product

Textural influence of marketable products provides a basis for judging whether or not certain textural features enhance a product's desirability in the marketplace. The following three categories were used:

Category	Number
Influence	0
Likely influence	84
No influence	78

Texture includes a variety of considerations including: secondary coatings, such as caliche; waviness (or uneven surfaces) associated with cleavage and composition; surface habit of certain minerals, such as micas; small surficial sedimentary structures; and differential weathering or alteration characteristics. This characteristic directly reflects the primary use of the product. Quarries where texture enhances the desirability of stone in the marketplace are Kavalla Ridge, Rocanville-Wing, Rock Works, Maad Mountain community pit, Grouse Creek Mountains quarries, Moenkopi Moca, Cumberland Gap Hearth Stone and many other quarries.

Uniform Product Thickness

This characteristic groups geologic features of bedding thickness and jointing patterns with human considerations of market needs and operator preferences. Two categories were established:

Category	Number
Yes, uniform thickness products are produced	99
No, products are generally of random thickness	62

This characteristic is self-explanatory. The two categories reflect products as quarried and do not account for any secondary processing, such a sawing or chopping. Uniformity of thickness can apply to products of any thickness, from very thin to very massive slabs. No specific product thickness is implied.

Operations where products of uniform thickness are produced include Quality Stone material site, Raft River community pit, Lynn Spring quarry, Vertical Cloud proposed quarry, Virgin community pit, and many others. Operations

where products of random thickness are found include Turquoise quarry, Bear Lake community pit, Rhyolite quarry, Bright quarry, Drum Slate quarry, and many others.

Lithology, Hardness, and Durability

Three characteristics, lithology, durability, and hardness, are combined in this category as a qualifier of the product. Lithology is characterized as metamorphic, igneous, and sedimentary rocks and may again be further subdivided (for example, gneiss, sandstone, basalt, or quartzite). Durability is characterized on the basis of the most likely use of the rock and does not imply hardness or durability in geologic terms; hardness is determined whether or not durability supports or detracts from the intended use of the product. Durability, for example, would indicate the tendency of the rock to withstand use, installer abuse, and weathering or whether a rock might disintegrate or pulverize with time. The following categories are established:

Category	Number
Advantageous	105
Moderately advantageous	47
Disadvantageous	10

Quarries in Utah categorized as advantageous for lithology, hardness, and durability include Grouse Creek Mountains quarries, Interstate, Lynn School, Peoa Blonde, Turquoise, and Reese Jenson, among others. Quarries categorized as disadvantageous include Bear Lake community pit, Spectrum, Lion Heart, Seep Ridge community pit, and others.

Rock Quality and Suitability

This category is probably the poorest defined field. It represents the author's subjective judgment--as fair, moderate, good, or excellent--based on the relative quality and suitability of the rock for its intended purpose in the marketplace.

Ease of Extraction

The following groupings were selected to describe the ease of extraction:

Category	Number
Very easy (no mechanized equipment was required, although it may be used)	42
Moderately easy (extraction was by ripping or use of hydraulic excavator)	68
Moderately difficult (blasting was likely required, or extraction was made difficult due to extensive overburden, unfavorable structure and so on)	34
Difficult (blasting was required, or extraction was carried out under confined or otherwise diffiicult conditions)	15

Variables that may be implicitly or explicitly considered within this characteristic:

- Mechanical and structural properties of the deposit (such as fractures and cleavage),
- Mechanical and structural properties of overlying and/or surrounding deposits,
- Depth of deposit,
- Stress history of deposit, or
- Physical access to deposit

Sites that present the most difficult extraction conditions include the Granite, Dove Creek, and Three Rivers quarries because blasting is required; and the Drum Slate quarry, Zebra marble, Bear Lake community pit, and others because access is limited. Sites with very easy extraction conditions included Reese Jensen operation, Cory Robinson quarry, Goose Creek talus and pit, Hechtle material site, Rocanville-Wing Tejon pit, Wyoming Stone, and others. Easy extraction conditions prevail at sites where stone is collected from talus or surface sites where excavations are not permitted. Difficult extraction conditions at Zebra Marble may be caused by abundant waste material and difficulty to remove waste.

Extent of Deposit

The purpose of this characteristic was to group those geologic attributes that relate to the spatial nature of the deposit. The following categories, along with the number of quarries in each category, used were:

Category	Number
Surficial	7
Limited or confined	50
Extended	102
Not applicable	2

A surficial deposit occurs where the material of interest was lying on the ground surface or buried within the upper few feet of surface soils with little or no overburden. Sites where stone is collected from the surface include Hechtle material site, Wyoming Stone, and Grouse Mountain quarry, along with several other sites. Limited or confined describes those deposits that are physically restricted due to topography, actual deposit size, or physical constraints such as the presence of pervasive cap rock or overburden. A number of factors influence this characteristic, including origin of the deposit (for example, a spatially limited dike or formation), structure (for example, a portion of the deposit is faulted and is not representative of the surrounding lithology), unconformities, and significant thicknesses of overlying soil deposits that require stripping prior to mining. Extended describes those deposits that have fairly substantial lateral and vertical extent, with non-limiting overlying soils.

This characteristic directly influences other characteristics, such as extraction and size of operation. It also bears directly on marketing and economic considerations. Examples of surficial operations are Skyline Pine, United Stone, and others mentioned above. Deposits considered as both surficial and limited or confined were placed in the latter category. Examples of limited or confined deposits are Wyoming Stone, Pretty in Pink, Picasso, Zebra marble, and others. Included within the category of extended deposits are many of the quarries located in Box Elder County, Utah, and Cassia County, Idaho, in addition to Limestone Mesa, Moenkopi Moca, Red Canyon basalt, Bacon Rock, Peoa Blonde, Cougar Mountain, Kavalla Ridge, and others.

Reserve Limits and Overburden

This is a subjective field to indicate author's judgment of the two site factors, mining reserves and overburden. Reserves may be extensive, large, limited, little, or unknown. Overburden ranges from a few feet to over 100 ft.

Number of Products

This characteristic is based on the number of quarry-run products, including hand-split products, but does not include secondary processing, such as sawing, tumbling, or chopping. Categories established for a number of products include:

Category	Number
Small (1 to 2 products)	107
Medium (3 to 5 products)	40, and 3 probable
Large (>5 products)	9

Small operations are not known to have a large number of products; however, the opposite is not always true. A few examples of quarries producing 3 to 5 products are Kavalla, Dove Creek quarry, Chew rock, Browns Canyon, Three Rivers, and Heber City area quarries along with many others. Examples of quarries producing >5 products are Limelight Green, Rocanville-Wing, Bright, and Turquoise, among other quarries.

Known Products

Known products category is self-explanatory and somewhat subjective. It lists the common products removed from a quarry, including those documented during examination of the site.

Physical Testing

A number of physical tests are occasionally conducted on building stone and dimension stone for the purpose of determining the quality of these materials for certain applications or uses. Standard testing methods used for stone are established by ASTM International (2006). ASTM International is a volunteer organization that sets technical standards for testing of materials, products, systems, and services. A few retailers and quarry owners conduct ASTM testing so they may properly represent their products to knowledgeable customers (for example, www.rollrock.com).

Standardized testing methods that are most commonly conducted on stone include (appendix I):

- Flexure testing of slate (modulus of rupture)
- Water absorption
- Compressive strength
- Bulk specific gravity

Other, less commonly used tests include:

- Taber abraser for abrasion resistance; or abrasion resistance of stone subject to foot traffic
- Flexure testing (breaking load, modulus of elasticity)
- Static coefficient of friction of ceramic tile and other like surfaces by the horizontal dynamometer pull-meter method
- Weather resistance

The scope of these tests, the ASTM test number identifier, and some test results collected by the author are given in appendix I. Other testing methods are listed on the websites of the Marble Institute of America (2006) and StoneInfo.com (2006).

QUARRYING PRACTICES

Stone quarrying and processing methods vary widely from hand-selecting of rock from surface rock and from talus piles, to hand splitting and sorting of rock, to the use of mechanized equipment at pit excavations, or a combination of all of these methods. Surface collection operations at sites where rock is removed from talus or rock piles, or from outcroppings by hand methods, is common and less costly. Such operations are present on private or state lands, or on BLM lands as mining claims, material sites or common use areas.

Surface-Collection Sites

Sites where stone is collected from the surface but where no surface disturbance exists are operated on mining claims, community pits, and materials sites on federal lands at several locations including, in the Grouse Creek Mountains and Uinta Basin of Utah, the Bitterroot Mountains of western Montana, and the western part of the Green River Basin of Wyoming. Talus deposits of the Elba Quartzite are scattered as thin veneers across wide areas of the Grouse Creek Mountains where the very hard, durable quartzite exhibits a moderate to strong yellowish-brown coloration (figure 21a, b). Rock is not easily amenable to mechanized mining so it must be hand-sorted at the site, and loaded by hand onto pallets. Pallets are loaded directly onto lightweight trailers or medium-duty haul trucks using a forklift, and then moved to a shipping point. Durable blocks and slabs of the Jurassic Nugget Sandstone are also removed from talus piles in southwest Wyoming's Green River Basin by the same method (figure 21c, d). Hand collection of surface rock from talus slopes of the Prichard Formation is also widely employed in western Montana.

The surface collection of stone is allowed at designated Common Use or Community Pit Sites where rock may be removed by hand-only or mechanized methods by the general public at a nominal cost. Flaggy sandstone from the Frontier Formation is removed from a common use site near Kemmerer in western Wyoming (figure 22a, b). Platy, rhyolitic, ash-flow tuffs of Miocene age that resemble flagstones are removed from sites located northwest of Idaho Falls (figure 22c, d) in eastern Idaho, and southwest of Oakley in southern Idaho, in addition to other sites included in this report.

Material Sites that only permit the collection of stone at the surface are designated at selected locations on federal land. Mechanized equipment is prohibited at certain sites, such as at the Jensen and Hechtle material sale sites in the Uinta Basin, to minimize surface disturbance. Rock scattered about at the surface, where use of mechanized equipment may be prohibited, (figure 23a-c) is sorted and loaded by

Figure 21. *Surface collection site of building stone from talus on mining claims. No excavations are present at these sites. Stone is sorted and loaded directly onto pallets. Precambrian Elba Quartzite in central part of Grouse Creek Mountains, Box Elder County, Utah (a, b). Nugget Sandstone (Jurassic) in western Green River Basin, 18 mi west of Kemmerer, Lincoln County, Wyoming (c, d). The similarity of these flagstones is remarkable considering their widely differing locations and ages.*

Figure 22. *Sites of surface collection of outcropping rock from BLM common use areas. Sandy flagstone of Frontier Formation located on Oyster Ridge, 1 mi south of Kemmerer, Lincoln County, Wyoming (a, b). Maad Mountain rhyolite "Desert Varnish" (Tertiary age) located 60 mi northwest of Idaho Falls, Clark County, Idaho (c, d). Note the vehicle tracks leading uphill in c.*

hand onto lightweight trailers and transported to a shipping site. At a State of Utah surface collection site, the operator collects stone from outcrops then sorts and loads it onto pallets by hand; pallets are loaded onto haul trucks with a forklift (figure 23d). At other material sale sites, mechanized equipment is allowed for both mining and loading (for example, Limestone Mesa in St. George FO area).

Excavations

Hand Methods

Although heavy equipment is used at excavations to dislodge, uncover, or transport the rock to a separate work site, hand methods are the primary method used to split, sort, and stack rock onto pallets at flagstone excavations. Mechanized equipment offers advantages where building stone is removed at non-flagstone operations. For example, at the Quality Stone Torrey operation just discussed, hand-mechanized excavations are operated in two ways. By the first method, rock is excavated with hand tools, then hand-split, -sorted, and -palletized at the excavation site (figure 24d). Sorting takes place by the worker segregating two, three, or more products onto separate pallets that exhibit differing thicknesses and overall dimensions. For the second method, rock is excavated with heavy equipment and is either split and sorted at the excavation site, or pit-run rock may be transported to a remote work site a few hundred feet or several miles away where the rock is hand-split, -sorted, and -stacked onto pallets (figure 24a, b). The latter process is sometimes more efficient because it facilitates sorting and easier removal of waste rock, and the remote site can serve multiple purposes as a temporary camp, maintenance yard, field office, and shipping point for products. However, excavating and hauling product to the remote site results in a larger percentage of waste at both the quarry and the remote sites that requires disposal.

Mechanized Removal of Rock

Operators remove rock from pits by a number of mechanical methods, including use of hand-pneumatic (figure 25a, c) or excavator-mounted chisel, skid-steer or articulated front-end loaders (FEL) (figure 25b, c), hydraulic (track or wheel) excavators (HE) (figure 25d), and crawler tractors equipped with dozer or ripping attachments. The method of extraction varies with the product desired and the nature of the product's occurrence. The two most common operating methods employ HEs working in a pit (figure 25d) to either (1) load rock for removal by truck to a remote site for hand-splitting, sorting, and palletizing (figure 24a, b), or (2) facilitate the hand-splitting, -sorting, and -palletizing at the working face (figure 24d; figure 26b). A FEL or HE may remove waste and overburden. The larger sized, articulated FEL more efficiently removes, loads, or transports rock to a nearby hand work site, up to 10 miles away, because it may eliminate the need for short haul by truck resulting in reduced breakage of rock compared to the HE.

Major problems that must be addressed differently at each quarry site include: (1) how to efficiently reach the marketable rock; (2) how to remove waste that impedes the hand work or sorting of marketable product, and (3) how to reduce unnecessary breakage of rock that causes a larger percentage of waste than normally produced at the working pit or face. The larger flagstone quarrying operations (for example, Limelight Green quarry in Box Elder County) use an HE to loosen rock at the working face, where the hand splitting takes place on a leveled pad. Blasting is used at this stage but is employed very infrequently. After splitting and removal of desirable rock is complete, an FEL regularly removes waste to clear the site for another cycle.

The very large Three Rivers quarry near Challis, Idaho uses only a slightly different approach to achieve a high rate of production patterned after large-scale open-pit gold mines in Nevada (figure 26). Twelve-foot benches are drilled using small track-mounted, air-rotary drills (figure 27a-c), and then broken with a non-pulverizing, light explosive charge used to only heave and loosen the rock. An HE then pulls the rock (figure 26a, far left) to within reach of splitting crews to form a loosened pile where hand work takes place (figure 26b). This is followed by regular site leveling and disposal of waste with an FEL and 40-ton haul trucks. This operation had the highest producing rate of any quarry at 22.5 tons per splitter per week because the mechanization facilitates the hand work by creating a neat work area with abundant splittable rock.

Blasting is used in a number of ways to suit varying objectives from pulverizing, to breaking into small- or large-sized blocks, or to loosen the rock. Objectives vary from shattering for overburden removal (figure 27b), to breaking rock to a desired size, to loosening and heaving rock for later hand splitting (figure 27d), or to produce rock for building stone blocks or for crusher feed (figure 29a). The cost of drilling and blasting can average less than a dollar per ton, but this cost varies with rock strength, drill depth, and volume blasted.

Forklifts load palletted flagstone onto lightweight trailers, 6x4 haul trucks, or 18-wheel tractor-trailers (figure 28a-d). Often, rock is loaded directly into haul or dump trucks (figure 29b) for transport to remote sites for hand-processing or crushing and sizing (figure 30 a, b).

The proportion of mining methods used in quarrying operations is compiled in table 5 for sites investigated by the author in the study area. Data are reported in two ways. Tons reported in this table are maximum tons produced (peak production) in any year during the 1995-2004 reporting period. The first column shows the type of mining method, whether hand or mechanized or a combination. If hand methods were used, the type of hand method is compiled in the second column, whether hand-splitting, -sorting, or surface collection. Table 5 shows that mining is entirely by hand methods for 11 percent of quarry production (lines 1-2 in column f), and involves some form of hand operation in 90 percent of quarry production (lines 4-5 in column f). By the second reporting method, the percentage of quarries (column d) may provide an equal or better comparison between mining methods because tons produced is reported for only 80 quarries in column (e) whereas percentages in column (d) provides data from 161 quarries. Data by these two reporting methods are in general agreement. It was not possible to analyze the proportion of additional processing applied to some products, such as chopping, tile and band sawing, or tumbling, when this processing sometimes takes place off-site and was not measured.

Figure 23. *Surface collection sites from material sites in Green River Formation, Uinta Basin, Uintah County, Utah. Buff sandstone located on Jensen (76162) material sale, 50 mi south of Vernal, Utah (a, b). Buff sandstone at Hechtle material sale (76177), 55 mi south of Vernal, Utah (c). Palleted sandstone blocks on State of Utah lease, 50 mi south of Vernal, Utah (d).*

Figure 24. *Hand-splitting of landscape rock with a hammer and chisel, and then followed by hand-sorting by size prior to loading rock onto pallets. Rock is removed from a nearby pit to an area for splitting and palletizing, Lynn Spring quartzite quarry, Box Elder County, Utah (a, b). Large blocks of argillite stone removed by hand tools, Kavalla Ridge quarry, Lincoln County, Montana (c). Hand excavation and tools with pallets of rock at excavation, Rocanville Tejon Stone quarry, Millard County, Utah (d). Photos courtesy of Bonneville Quarries, Kavalla Ridge quarry, and Rocanville Stone.*

Figure 25. *Equipment used at various levels of mechanized mining at building stone quarries. Pneumatic chisel (red pneumatic hose) used for separating rock layers at the working face and a track loader used for removing waste rock at Multi-colored Green/Pitchfork Springs quarry, Millard County, Utah (a, c). Front-end wheel loader used for removing waste (b). Track hydraulic excavator used to loosen and load flaggy quartzite onto haul truck at Green Peak quarry, Box Elder County, Utah (d). A mill site where hand-splitting, -sorting, and -palletizing occurs, is located on a level pad site 1.5 mi away. Photos courtesy of Heritage Stone & Pitchforth Springs quarry.*

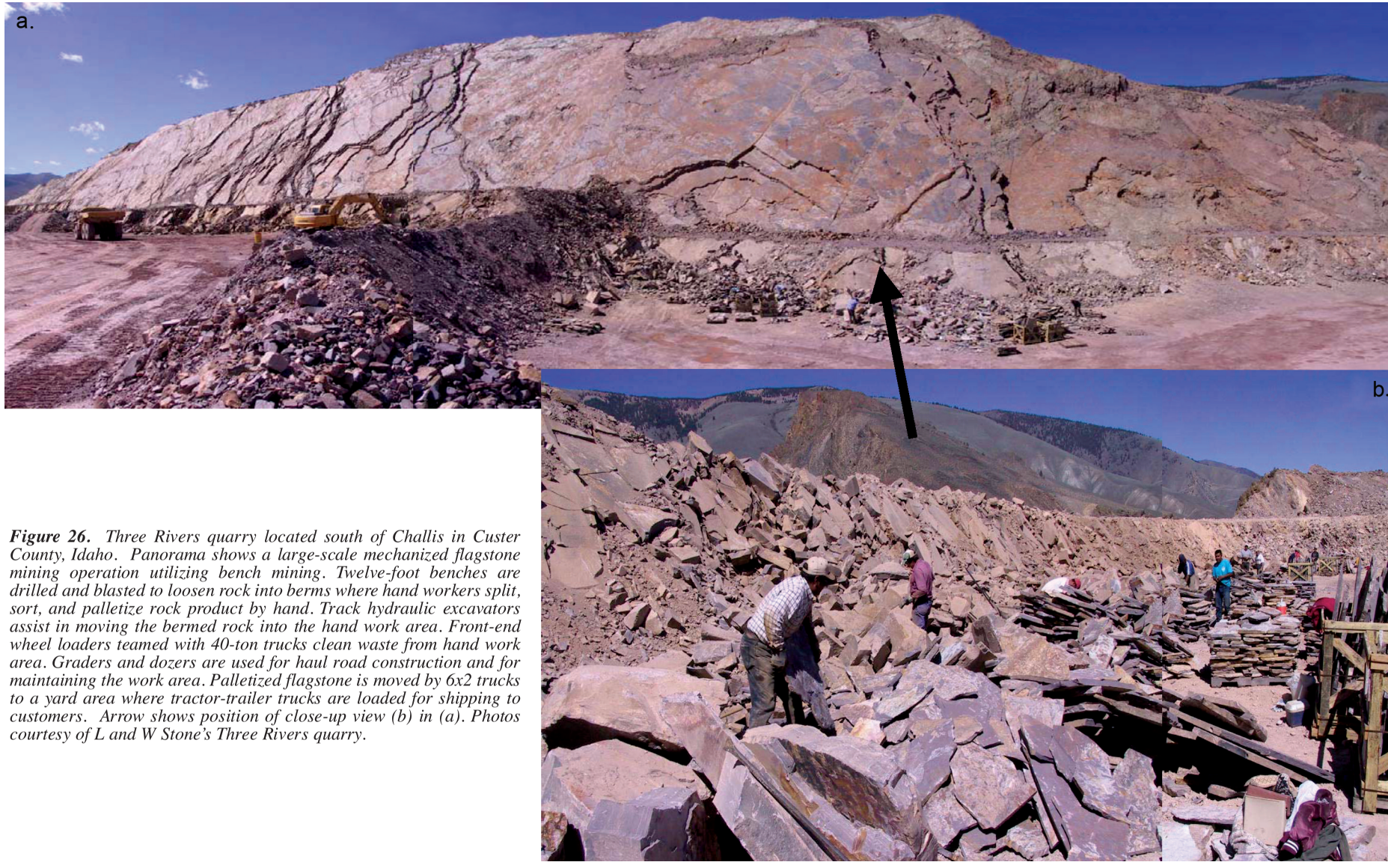


Figure 26. *Three Rivers quarry located south of Challis in Custer County, Idaho. Panorama shows a large-scale mechanized flagstone mining operation utilizing bench mining. Twelve-foot benches are drilled and blasted to loosen rock into berms where hand workers split, sort, and palletize rock product by hand. Track hydraulic excavators assist in moving the bermed rock into the hand work area. Front-end wheel loaders teamed with 40-ton trucks clean waste from hand work area. Graders and dozers are used for haul road construction and for maintaining the work area. Palletized flagstone is moved by 6x2 trucks to a yard area where tractor-trailer trucks are loaded for shipping to customers. Arrow shows position of close-up view (b) in (a). Photos courtesy of L and W Stone's Three Rivers quarry.*

Figure 27. *Track air-rotary blast-hole drills at stone quarries. Air drills at Rocanville mine in Millard County, left, and Red Beryl mine, right, Beaver County, Utah (a, c). Blast-hole drilling at Clarks Basin flagstone quarry, Box Elder County, Utah (b). Drill is located atop six ft of waste rock ready for blasting and removal (left of solid line). Quartzite of Clarks Basin is drilled, blasted and thrown to the right (right of dashed line) for later hand-splitting, -sorting, and -palletizing. Blasting of orthogneiss to create rubble product (right of arrow and dashed line) for hand-splitting and -sorting at Northern Stone Supply Granite quarry south of Oakley in Cassia County, Idaho (d). Photographs courtesy of Bonneville Quarries, Red Beryl mine, Rocanville Stone, and Northern Stone Supply.*

Figure 28. *Use of forklifts and haul trucks. Front end wheel loader (a) used for lifting pallets also used with bucket attachment for cleaning of hand work area, Rocanville's Tejon quarry, Millard County, and smaller forklift (c) at Lone Pine, Box Elder County, Utah. Pallets of flagstone loaded on trucks in Box Elder County, Utah (b) and Custer County, Idaho (d). Photographs courtesy of Rocanville Stone, Rock Works, and Bonneville Quarries.*

Figure 29. *Haul trucks used in stone mining operations, Bright quarry, Iron County, Utah. Rock is hauled to crusher site about a mile to south (a). Twelve-ton dump truck used to move rock of Prichard Formation and Bead Lake quarry to hand splitting and sorting yard area nearby, Pend Oreille County, Washington (b). Rock at Bead Lake quarry is blasted and loaded onto truck with a hydraulic track excavator. Photos courtesy of Bright quarry and Bead Lake quarry.*

Figure 30. *Crusher and screening operations at stone quarries. Bright landscape aggregate quarry, Iron County, Utah (top). Note the several piles of products of differing size. Crusher, screen, and storage bin at Rocanville-Wing Rich Gulch-Black Rock limestone quarry, Millard County, Utah (bottom). Photos courtesy of Rocanville Stone and Bright quarry.*

Table 5. *Proportion of mining and processing methods used at quarrying operations.*

(a) Mining (and processing) Method	(b) Hand Methods	(c) Number of quarries	(d) Percent of quarries	(e) Tons produced**	(f) Percent of tons produced*
Hand only	Hand-split, -sort	7	3%	4,100	2%
Hand only	Surface collection	33	15	20,682	9
Blasting, hand	Hand-split, -sort	2	<1	0	0
Hand-mechanized combined	Hand-split, -sort	103	48	190,564	80
Mechanized	None	16	7	24,040	10
Not determined	Not determined	54	25	--	--
		215	100%	239,386	100%

* Does not sum to 100% due to independent rounding
** Tons are tons of peak production during any of the 1995-2004 period; based on production from 80 quarries

An estimate of the quantity of waste generated by a hand-mechanized combined, and hand-split and -sort operation of medium size (category 4 in table) was provided by one quarry operator. This operator uses an HE to load the rough rubble product into a 12-ton dump truck for transport to a nearby level site for hand-splitting, -sorting, and -loading of stone onto pallets. A medium-duty flat-bed truck transported the finished pallets to a shipping point accessible by large flat-bed tractor-trailer trucks. Waste produced at the quarry was estimated at 50 percent and additional waste produced at the splitting-sorting site was 15 percent. This means that for every 100 tons of rubble product a total of 235.3 tons was disturbed at the quarry, from which 117.6 tons was transported to the splitting and sorting site. In this example, the total quantity of waste produced is 58 percent while the product derived is 42 percent. If a flagstone product of reduced thickness or higher quality is desired, the percentage of waste would be larger.

Processing

A variety of methods of stone processing allow operators to create the largest number of products to meet widening customer demand. Crushing, sorting, splitting, cutting, sawing, tumbling, polishing, hand-fashioning, or some combination of these processes provide a range of value-added products from quarry-run rock. Processes can be varied to create products to fit the variety of architectural, masonry, or landscape needs. Hand-splitting and -sorting have already been mentioned. Large boulders are collected or sorted at quarries and often marketed in the raw form for building stone purposes including for creating water features, fountains and ponds. Crushing is a common process applied to many stone products sold as building stone products used for landscape purposes.

Dimension stone is an important value-added product of Utah stone mining operations, yet the quantity of production of stone for non-dimension products far exceeds that for dimension stone products. Dimension stone processing operations most commonly used include sizing with a hydraulic cutter machine and tumbling. For example, irregularly-sized sandstone slabs are cut to consistent brick-like (or paver) size using hydraulically-driven splitter devices (figure 31b, c). A gang tile saw (figure 32a) is used to simultaneously cut several exact-sized rock tiles. Slab product from Three Rivers Stone, for example, is hand split, cut in a gang tile saw, and tumbled an hour in cement-mixer-like tumbler (figure 31a, d) to round edges and corners to create paver blocks (figure 31d). At least three quarries operate gang tile saws: Rocanville Stone, Three Rivers, and Oakley Stone. Several quarries operate hydraulic splitters, including the Three Rivers, Cumberland Gap Hearth Stone, Bacon Rock, State Stone, Cream Time (Mayfield), Brown's Canyon, Hot Springs, Chew Rock and Montana Rock Works' quarries. At least four quarries or operators use tumblers (Cumberland Gap Hearth Stone, Brown's Canyon, Cream Time-Mayfield, and Northern Stone).

Large wire and bar (band) saws are used to create thick sheets or slabs of rock measuring one inch or more in thickness (figure 32b-d). Smaller radial saws and polisher tables are used for second stage work, followed by hand fashioning of sawed stone to create some products (figure 33). Hansen Stone near Kanab, State Stone near Torrey, and Browns Canyon #1 near Heber operate stone sawing plants for production of dimension stone products in Utah. Dimension stone use has been prominent through Utah's history (Tripp, 1993). Hansen Stone and State Stone operate sophisticated chain, band, and circular saw tools to create marketable products from massive (non-flaggy) sandstone blocks. Some production from Chew Rock is specialty dimension stone. Other dimension stone sources not compiled in the database include a quartz monzonite quarry in Cottonwood Canyon, a sandstone quarry near Kyune in Utah County, and two limestone quarries near Ephraim and Manti (SubTerra, 2004).

Figure 31. *Rock tumbler, hydraulic rock cutter (chopper) and sample rock products. Tumbler (a), hydraulic cutter (b), chopped sandstone block using hydraulic cutter, Cumberland Gap Hearth Stone, Kemmerer, Wyo (c). Tumbled tile product created from chopped sandstone at Three Rivers quarry, Custer County, Idaho (d). Photos courtesy of Cumberland Gap Hearth Stone and L and W Stone.*

Figure 32. *Gang tile, wire, and bar saws. Gang tile saw used to cut rock into 12-in x 12-in size tiles, Oakley Valley Stone, Idaho (a). Wire and cable bar saws used to cut blocks into slabs 2-in thick or more, State Stone, Torrey, Utah (c, d). The cable bar saw (d) is capable of a penetration rate of 16 in/min in sandstone (b). Bar saw uses 200 gal/min of water for cooling and lubrication. Photos courtesy of State Stone and Oakley Valley Stone.*

Figure 33. *Radial slab saw, rock polishing table, and hand-fashioning of slabbed rock into a curbstone product. Radial slab saw (a), rock polishing table (b), and hand rock for curbstone (c). Photos courtesy of State Stone and Hansen Stone.*

CONCLUSIONS

Building stone in the study area is extracted from widely varying geologic units ranging in age from Precambrian to Recent. In Utah, stone is extracted from rock representing nearly every geologic time period. The two most important sources in Utah are the Cambrian Quartzite of Clarks Basin and Precambrian Elba Quartzite located in Box Elder County, an important quarrying area which extends into adjacent Cassia County of Idaho. The Tertiary Green River Formation in the Uintah Basin is also important. Stone from these sources is mined from quarries or collected from the surface at 73 sites across the study area. Other important sources of stone are, in order of decreasing importance, the Triassic Moenkopi and Chinle Formations, the Cambrian Marjum Formation, and the Jurassic Nugget and Navajo Sandstones. Rock types removed from quarries include: (1) metamorphic rocks consisting of gneiss, marble, amphibolite, quartzite, slate, argillite, or schist; (2) sedimentary rocks consisting of sandstone, limestone, dolomite, or shale; and (3) igneous rocks consisting of basalt, rhyolite, tuff, and granite. Quartzite, sandstone, and limestone rock types are the most important sources of building stone.

Fifty-three percent of the 215 quarries investigated during the study recorded production of stone during the 1995-2004 period. The recorded production from Utah stone quarries increased more than eight-fold from 11,589 tons in 1995 to high of 102,202 tons in 2001, then decreased slightly to 91,489 tons in 2004. The top ranking counties in Utah in terms of maximum production over the 1995-2004 period are Summit County (54,955 tons), Box Elder County (38,856 tons), Beaver County (22,985 tons), and Iron County (19,350 tons). In Idaho, the top producers examined include Custer County (36,784 tons) and Cassia County (24,100 tons). Total stone production in the study area in 2004 was 165,861 tons from 68 quarries. Ninety-nine percent of total stone production in 2004 came from 42 quarries that produced 200 or more tons annually (medium and large categories), while ninety percent of 2004 production came from 23 quarries that produced 2000 or more tons annually (large category). The largest five producing quarries in 2004, those that produced 5000 or more tons, combined to produce 59 percent of all stone mined in the area of study. The five quarries are: Three Rivers quarry, Custer County, Idaho (36,000 tons), Bright quarry, Iron County, Utah (18,500 tons), Browns Canyon #1-Mountain Valley Stone, Summit County, Utah (17,295 tons), Scrivanich Natural Stone, Cassia County, Idaho (14,000 tons), and Bead Lake quarry, Pend Oreille County, Washington (5760 tons). The combined production of stone in 2004 from state and private lands is about equal to the combined production from federal lands (including mining claims, material sales, common use and community pit sites).

Several characteristics recorded in the inventory and the spreadsheet, Stone_sites.xls, permit a subjective evaluation of mining conditions at the quarry and of rock produced. Characteristics that reflect the nature of the stone removed include: color; geology; rock type (lithologic description and other characteristics); effect of fractures and cleavability upon extraction and product dimensions; influence of texture on marketable product; uniform product thickness; lithology, hardness, and durability; and rock quality and suitability. Characteristics used for evaluation of the site include: size; ease of extraction; extent of deposit; reserve limits and overburden; number of products; and known products. Favorable, less favorable, or unfavorable ratings for these characteristics reflect upon the quality, minability, and marketability of the product.

Flagstone, used for walls, ledges, patios, and similar applications, is the most important stone product. Random and rubble stone, boulders, and crushed rock are products of secondary importance. Most flagstone is removed from quarry excavations involving a combination of mechanized and hand methods, but a significant proportion is hand-collected from surface outcrops, or talus piles where mechanized equipment is prohibited or the equipment is used only for loading pallets onto trucks.

A survey of quarrying practices reveals that most stone produced at quarries is flagstone that typically requires hand-splitting, -sorting, and -stacking on pallets. Mechanized equipment, usually hydraulic excavators, front-end loaders, trucks, and forklifts, are commonly used in conjunction with significant hand labor. Ninety percent of stone produced at quarries involves some sort of hand processing; about 11 percent is processed only by hand methods; and 10 percent of stone is produced by mechanized-only methods; while the remainder is produced using combination of these methods. Other practices include the infrequent used of drilling and blasting to facilitate hand labor or for overburden removal, or for crushing and sorting to create a range of sizes for landscape aggregate. Hydraulic splitters and/or rock tumblers are used to create paver blocks, gang saws are used to create tiles of exact dimension, or a combination of this equipment may be employed in tandem. Large-scale wire and bar saws are used by a few operators to reduce large (4 ft x 5 ft x 5 ft) quarried blocks to smaller blocks or slabs of specific dimensions.

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APPENDIX

ASTM physical tests and selected results for dimension stone

This appendix lists the most common ASTM Intenational physical tests used to determine the nature, characteristics, or quality of dimension stone. The ASTM International establishes test standards for materials testing in engineering, manufacturing, and trade.

Several examples of test results are given. Test results were obtained from retail distributors of stone and from unpublished technical reports of the U.S. Bureau of Land Management.

The list of common ASTM tests and example test results given are for information purposes only. No tests were completed during preparation or writing of this report.

Headers:	
ASTM No.	Test number
ASTM Test Name	Test name
Scope	Explanation
HyDesert stone	Sample name-test analysis given
Micaceous sandstone (Auburn Mist)	Sample name-test analysis given
Dolomitic limestone (Alverson Limestone)	Sample name-test analysis given
Mica schist(Crystal Lake Ashlar)	Sample name-test analysis given
Quartzitic sandstone (Split ledge fieldstone)	Sample name-test analysis given
Gneiss (Ironstone dark splitface)	Sample name-test analysis given
Dolomite limestone (Seneca ashlar)	Sample name-test analysis given
Idaho quartzite	Sample name-test analysis given
Sandstone	Sample name-test analysis given
Flathead quartzite (Fishtrap quarry)	Sample name-test analysis given
Grinnell Fm. Quartzite (Stryker)	Sample name-test analysis given
Prichard Fm argillite (Plains)	Sample name-test analysis given
Shaley limestone (Spectrum)	Sample name-test analysis given

Appendix 1 - Physical tests and selected results for dimension stone

ASTM No.	ASTM Test Name	Scope
Source	www.astm.org	
C120-05e1	Standard Test Methods of Flexure Testing of Slate (Breaking Load, Modulus of Rupture, Modulus of Elasticity)	These test methods cover determination of the modulus of rupture and modulus of elasticity of slate by means of flexure tests.
C121-90	Standard Test Method for Water Absorption of Slate (1999)	This test method covers the determination of the water absorption of slate.
C1352-96	Standard Test Method for Flexural Modulus of Elasticity of Dimension Stone (2002)	This test method covers the procedure for determining the flexural modulus of elasticity of stone by using a simple beam with quarter-point loading.
C1353-98e1	Standard Test Method Using the Taber Abraser for Abrasion Resistance of Dimension Stone Subjected to Foot Traffic	This test method covers the establishment of an index of abrasion resistance by determination of loss of weight resulting from abrasion of dimension stone as described in Terminology C 119 and is modeled after Test Method C 501.
C1528-02	Standard Guide for Selection of Dimension Stone for Exterior Use	This guide is intended to be used by architects, engineers, specifiers, contractors, and material suppliers who design, select, specify, install, purchase, fabricate, or supply natural stone products for construction applications.
C170-90	Standard Test Method for Compressive Strength of Dimension Stone (1999)	This test method covers the sampling, preparation of specimens, and determination of the compressive strength of dimension stone.
C217-94	Standard Test Method for Weather Resistance of Slate (2004)	This test method covers two procedures for weather resistance of slate in all outdoor installations by determining the depth of softening by an abraser or by hand scraping. The test is based on the fact that slates containing pyrite, calcite, and carbon undergo a chemical weathering which results in the conversion of the calcite particles to gypsum. The swelling action that results causes disintegration of the slate. The extent of this action on various slates in the test has been found to correlate with the durability of the materials in actual weathering.
C241-90	Standard Test Method for Abrasion Resistance of Stone Subjected to Foot Traffic (2005)	This test method covers the determination of the abrasion resistance of all types of stone for floors, steps, and similar uses where the wear is caused by the abrasion of foot traffic.
C880-98	Standard Test Method for Flexural Strength of Dimension Stone	This test method covers the procedure for determining the flexural strength of stone by use of a simple beam using quarter-point loading.
C97-02	Standard Test Methods for Absorption and Bulk Specific Gravity of Dimension Stone	These test methods cover the tests for determining the absorption and bulk specific gravity of all types of dimension stone, except slate.
C99-87	Standard Test Method for Modulus of Rupture of Dimension Stone (2000)	This test method covers the determination of the modulus of rupture of all types of dimension stone except slate.

Appendix 1 - Physical tests and selected results for dimension stone

ASTM No.	Results for Selected Samples of Dimension Stone					
	Hy Desert stone	Micaceous sandstone (Auburn Mist)	Dolomitic limestone (Alverson Limestone)	Mica schist (Crystal Lake ashlar)	Quartzitic sandstone (Split ledge fieldstone)	Gneiss (Ironstone dark splitface)
Source	Sandfordstone.com	Rolling Rock Building stone www.rollrock.com	Rolling Rock Building stone www.rollrock.com	Rolling Rock Building stone www.rollrock.com	Rolling Rock Building stone www.rollrock.com	Rolling Rock Building stone www.rollrock.com
C120-05e1	Modulus of rupture 3236 psi					
C121-90	0.67 (no units given)					
C1352-96						
C1353-98e1						
C1528-02						
C170-90		Perpendicular to rift-wet 6990 psi, -dry 7260 psi; parallel to rift-wet 4390 psi, -dry 10,970 psi	23,815 psi	Perpendicular to rift-wet 20,320 psi, -dry26,740 psi; parallel to rift-wet 18,940 psi, -dry27,790 psi	21,500 psi	21,500 psi
C217-94	0.001 in					
C241-90	15.82 (no units given)					
C880-98		Parallel to rift 690 psi				
C97-02	2.661 g/cc	0.57%, 164.3 lb/cu.ft	0.34%, 170 lb./cu.ft	0.38%, 167.7 lb./cu.ft.	0.79%, 156 lb./cu.ft	0.79%, 156 lb./cu.ft.
C99-87		1350 psi	2990 psi	Perpendicular to rift-wet 2700 psi, -dry 3710 psi	5975 psi	5975 psi

ASTM No.		Results for Selected Samples of Dimension Stone (continued)					
	Dolomitic limestone (Seneca ashlar)	Idaho quartzite	Sandstone	Flathead quartzite (Fishtrap quarry)	Grinnell Fm. quartzite (Stryker)	Prichard Fm argillite (Plains)	Shaley limestone (Spectrum)
Source	Rolling Rock Building stone www.rollrock.com	Northern stone Supply, Middle Mountain	Jeff Garett, LaMadre stone Validity examination	Berg (1974)	Berg (1974)	Berg (1974)	Tesener (2004)
C120-05e1							
C121-90							1.72% (8 analyses)
C1352-96							
C1353-98e1							
C1528-02							
C170-90	14,900 psi	30,000-50,000 psi	Perpendicular to rift-wet 4480 psi, -dry4650 psi; parallel to rift-wet 4390 psi, -dry 5580 psi				
C217-94		Does not deteriorate or weather in most extreme circumstances					Deteriorates under normal weather conditions in a few years
C241-90							
C880-98							
C97-02	1.42%, 164 lb./cu.ft.	0.2%, 160-170 lb./cu.ft.	4.8%, 2.32 g/cc	0.94%, 2.95 g/cc	0.4%, 2.56 cc	0.06%, 2.75 g/cc	
C99-87	3350 psi	3500 psi (3/4 in and 2 in thickness)	Perpendicular to rift 1760 psi; parallel to rift 1450 psi				

Appendix 1 - Physical tests and selected results for dimension stone

ASTM No.	ASTM Test Name	Scope
C1526-03	Standard Specification for Serpentine Dimension Stone	This specification covers the material characteristics, physical requirements, and sampling appropriate for the selection of serpentine (serpentine marble) for general building and structural purposes.
C1527-03	Standard Specification for Travertine Dimension Stone	This specification covers the material characteristics, physical requirements, and sampling appropriate to the selection of travertine for general building and structural purposes.
C503-05	Standard Specification for Marble Dimension Stone	This specification covers the material characteristics, physical requirements, and sampling appropriate to the selection of marble for general building and structural purposes.
C568-03	Standard Specification for LimeStone Dimension Stone	This specification covers the material characteristics, physical requirements, and sampling appropriate to the selection of limestone for general building and structural purposes.
C615-03	Standard Specification for Granite Dimension Stone	This specification covers the material characteristics, physical requirements, and sampling appropriate to the selection of granite for general building and structural purposes.
C616-03	Standard Specification for Quartz-Based Dimension Stone	This specification covers the material characteristics, physical requirements, and sampling appropriate to the selection of quartz-based dimension stone for general building and structural purposes.
C629-03	Standard Specification for Slate Dimension Stone	This specification covers the material characteristics, physical requirements, and sampling appropriate to the selection of slate for general building and structural purposes.
C1028-96	Standard Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull-Meter Method (Withdrawn 2005)	This test method covers the measurement of static coefficient of friction of ceramic tile or other surfaces under both wet and dry conditions while utilizing Neolite heel assemblies.

Appendix 1 - Physical tests and selected results for dimension stone

ASTM No.	Results for Selected Samples of Dimension Stone					
	Hy Desert stone	Micaceous sandstone (Auburn Mist)	Dolomitic limestone (Alverson Limestone)	Mica schist (Crystal Lake ashlar)	Quartzitic sandstone (Split ledge fieldstone)	Gneiss (Ironstone dark splitface)
C1526-03						
C1527-03						
C503-05						
C568-03						
C615-03						
C616-03						
C629-03						
C1028-96						

ASTM No.		Results for Selected Samples of Dimension Stone (continued)					
	Dolomitic limestone (Seneca ashlar)	Idaho quartzite	Sandstone	Flathead quartzite (Fishtrap quarry)	Grinnell Fm. quartzite (Stryker)	Prichard Fm argillite (Plains)	Shaley limestone (Spectrum)
C1526-03							
C1527-03							
C503-05							
C568-03							
C615-03							
C616-03							
C629-03							
C1028-96							

CHAPTER 3

PRELIMINARY MARKET ANALYSIS

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ABSTRACT

This preliminary market analysis examines the building stone industry in Utah and parts of nearby Arizona, Idaho, Montana, Washington, and Wyoming. Two previous chapters addressed the inventory of quarries and yards and evaluated deposit characteristics and mining practices at quarries. This chapter briefly examines employment, transportation, distribution, costs, and prices at the quarry, wholesale, and retail level of Utah's building stone market. This analysis summarizes the market data of stone obtained during the investigation, consisting of an inventory of quarries in the region, data from State of Utah government agencies, employment data from the U.S. Department of Labor, interviews with retailers that distribute Utah stone, and market data obtained by others.

Utah building stone quarries employed 203 persons during 2004, which ranked third behind Montana's employment of 254 and Idaho's 224. Workers in Utah were employed an average of 34.6 weeks annually, or 281,605 hours in 2004, an increase of 53 percent over employee hours in 2002. A ton of stone required the input of 3.1 employee hours, on average, to mine, sort, and prepare the product for shipment.

Purchasing practices, quantities of stone purchased, and customer preferences for Utah stone were obtained from interviews of 121 retail stone distributors. These results account for purchase and reselling of 28,291 tons of flagstone, ledgestone, and related rubble products equal to 31 percent of Utah's 2004 stone production. Most retail stone distributors, or 76 percent, are within 400 to 1000 miles of Utah; this stone is shipped to: California (52 percent), Oregon (18 percent), Montana (10 percent), Washington (7 percent), Colorado (5 percent), Nevada (3 percent), Idaho (3 percent), and Arizona (2 percent). At most, hand-split thin flagstone is shipped up to 2,900 mi to Hawaii, in addition to destinations in Florida, Maine, and Guam. The average distributor purchase in 2004 was 197 tons while the largest was 3300 tons from California. Ninety percent of this amount consisted of flagstone of two-inches in thickness or less. Tractor-trailer rigs used to transport stone from the quarry transport 24 tons per load, or 12 pallets of stone, at a cost of $0.059 per ton per mile in 2004.

Wholesale prices show a linear relationship with retail prices; the wholesale prices range from $40 to $50 per ton for aggregate or crushed stone, $50-$175 per ton for boulders and ledge stones, and $175-$325 per ton for flagstone. For quarries, the operating cost averages about 44.8 percent of the wholesale price. On average, there is a 1-to-1.02 ratio the average wholesale price and the average retail price, except for the difference of $179.72 per ton between two prices. This difference represents the average markup set by the retailer.

A number of groups of stone products can be identified by their unique interrelationships with respect to wholesale price, production rate, and operating cost. These products consist of dimension stone (or stone with additional processing), hand-split flagstone, stone collected from the surface, crushed stone, and other specialty stone products. These interrelationships suggest a reliable method to differentiate between the unique marketabilities of these stone products.

INTRODUCTION

This preliminary market analysis provides a useful introduction to the various aspects of the stone market of Utah and nearby states. It examines employment, transportation, origin and destinations of products, and demand factors of products in the building stone quarrying business. Demand factors include the analyses of wholesale price, retail price, operating cost, and rate of production of stone. Data analyzed were collected during field and other investigations carried out during 2004 and 2005.

The nature, composition, and geographic extent of the data collected during 2004 are described in the first chapter of this report; a second chapter analyzes the quarrying practices and characteristics of stone deposits. The spreadsheet and maps that locate the quarries and yards described in the first chapter also remain useful throughout this chapter.

The first section of this chapter examines employment and productivity of employees in the building stone industry in Utah, Montana, Idaho, and Washington. Then the distribution network of stone is also examined. Utah's port-of-entry records sketch out the extent of the overall distribution of stone but a complete picture of this distribution is not possible. Another part of Utah distributor market is investigated by interviewing retail distributors of Utah stone.

A cost-revenue-production model is used to analyze the interrelationships of operating cost, wholesale price, retail price, and production rate for the region's stone operations. These interrelationships are used to differentiate between five types of stone products that result from the various quarry practices.

METHODS AND SOURCES OF DATA

Field work completed in 2004 documents the location of rock quarries and rock yards, and includes information on geology, operations, cost, production, and price data in a spreadsheet form, stone_sites.txt, introduced earlier. Figure 1 in chapter 1 portrays the location of quarries investigated and documented in this spreadsheet.

During 2005, the BLM interviewed 121 retail distributors of Utah stone in 14 states. Information was gathered about their purchases of building stone from three quarries in Utah. These quarries produced mainly flagstone, in addition to lesser amounts of boulders and aggregate. The retail distributors provided information about their buying habits, transportation cost and distance, reselling (retail) price, wholesale prices paid to quarries, market preferences, and the total quantity of rock purchased in 2004 from the three quarries. Individual retail distributor and quarry data are confidential and so are presented in aggregated form.

Other price and cost data were obtained during investigation of the market of stone in Arizona, Idaho, Nevada, and Utah in 2004. These data were collected, or studies were conducted, by the BLM Phoenix Field Office (Rentmeister, 2004; and Jeff Garrett, written communication, 2004) and the BLM Challis Field Office (Lewis, Detar, and Gardner, 2004; Ken Gardner, verbal and written communication, 2004), and the author and Larry Garahana. The third and fourth sections of this chapter analyze these aggregated data.

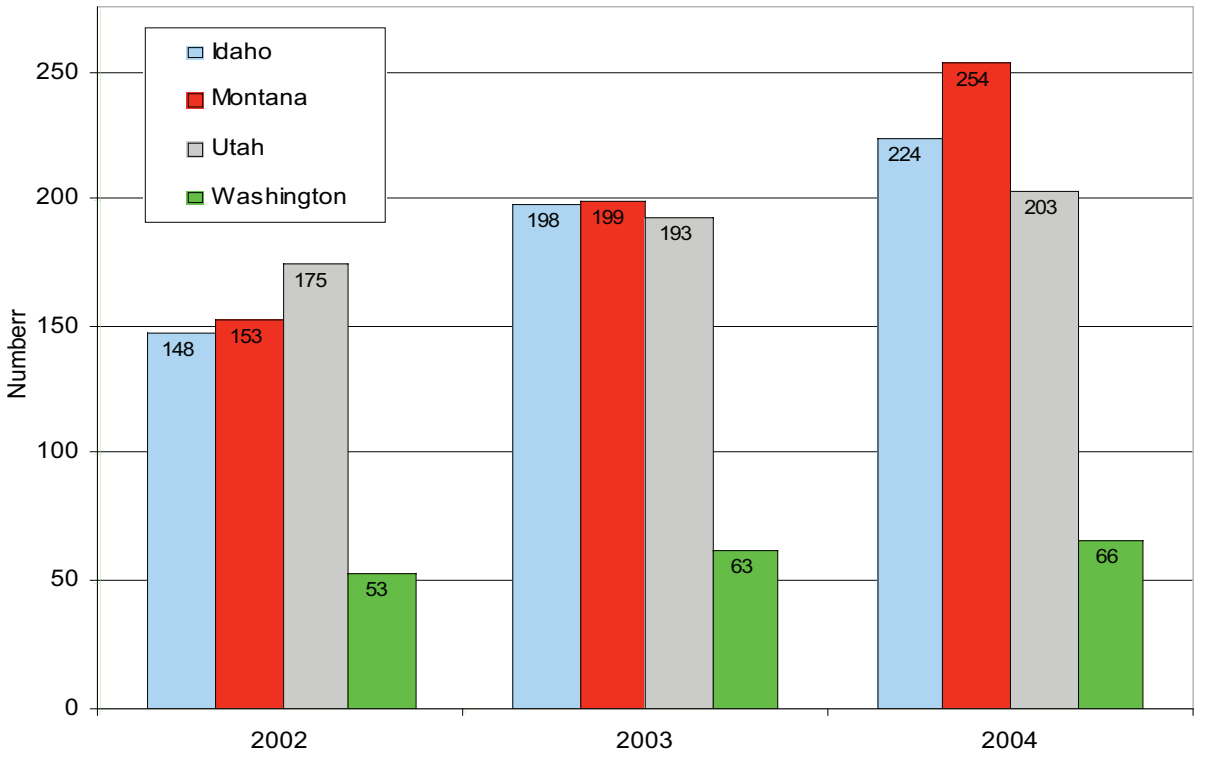

Figure 1. *Number of employees in building stone quarry operations in Idaho, Montana, Utah, and Washington, 2002-2004. (Source: MSHA)*

Utah state government sources of data include SITLA and DOGM. DOGM collects and maintains records for each mining operation in the state. SITLA production and site data are also aggregated to protect their confidential nature. Employment data is published by the Mine Safety and Health Administration (MSHA) of the U.S. Department of Labor. Reporting of data to MSHA is voluntary so it was found that data is not available for all sites reported in stone_sites.txt.

EMPLOYMENT

MSHA employment data for the building stone industry are summarized below for Idaho, Montana, Washington and Utah during the period from 2002-2004 (figure 1) and tabulated in appendix 1. These 2004 employment data show that Utah's quarries employed 203 persons, Montana's quarries employed 254 persons, Idaho's quarries employed 224 persons, and Washington's quarries employed 66 persons. Utah quarries showed a gain in employment of 16 percent from 2002 to 2004. The spreadsheet stone_sites.txt lists a total of 274 workers employed in quarry operations in Utah in 2004. The discrepancy between MSHA and the 2004 spreadsheet data, as explained by DOGM, is due to the inactive status of quarries, quarries operating intermittently, out-of-state companies operating in Utah or quarries sharing workers.

The MSHA hours-worked data indicate the seasonal nature of this work. It shows a 53 percent increase in hours worked in Utah, from 184,458 hours in 2002 to 281,605 hours in 2004 (table 1). From this data, Utah's average worker year consisted of 1387 hours or 34.7 weeks. Increases in employee hours from 2002 to 2004 in Idaho, Montana, and Washington were 68 percent, 87 percent, and 75 percent, respectively. The larger increase in hours worked over the 2002-2004 period compared to the number of employees may indicate that quarries are operating for longer seasons, that operations are decreasing their efficiency, or expanding, or that the number of quarries is increasing in number, or some combination of these factors. Washington has fewer employees because the number of quarry operations is less.

Understanding the productivity rate of workers that produce stone by hand methods is necessary to predict workforce needs and unit cost. Quarry workers interviewed about their productivity rate indicated that a ton of flagstone could be produced in a period ranging from two to four worker hours, although one worker said it required eight hours to produce stone less than ¾-in thick. This rate varied widely, depends on many factors, and has been discussed. Generally, a longer time is required by a worker to produce a ton of the more expensive product consisting of flagstone less than 1-in thick. An average productivity rate for all types of building stone of 3.1 hours per ton was computed for Utah in 2004 by dividing hours worked of 281,605 (MSHA) by 91,489 tons produced (DOGM), a productivity rate generally consistent with interview results. The production rate of workers was highest at the Three Rivers quarry near Challis, Idaho where workers averaged 22.5 tons per 40-hour week, or 1.8 hours per ton. This higher production rate can be explained by the scale and highly-mechanized operation of the Three Rivers quarry.

Table 1. *Employment in building stone quarries, 2002-2004*

(Source: Mine Safety and Health Administration, 2005)

	2002 employees		2003 employees		2004 employees		2002-2004 increase	
State	**Hours**	**Number**	**Hours**	**Number**	**Hours**	**Number**	**Hours**	**Number**
Utah	184,458	175	191,788	193	281,605	203	53%	16%
Idaho	159,861	148	246,199	198	269,023	224	68%	51%
Mont.	134,021	153	157,383	199	250,520	254	87%	66%
Wash.	54,709	53	88,375	63	95,673	66	75%	25%
Total	533,049	529	683,745	653	896,821	747	68%	41%

DISTRIBUTION

The movement of building stone is documented in two ways--from analysis of UDOT records and by interviews with a sample of retail distributors. The UDOT data are incomplete because a declaration of cargo is voluntary. Despite this, the data give a sketch of stone shipments into, out of, or through Utah.

Utah Port-of-Entry Records

Port-of-entry weight records obtained from UDOT in 2004 (appendix 2) show the point of origin (figure 2) and the destination point (figure 3) by zip code for 148 shipments. Although hundreds of shipments of stone and rock are transported in Utah each year, only a fraction of the total shipments are recorded in this way. These data show that most origination and destination points of stone are in Utah, with the highest frequency of zip code locations in Salt Lake County and reflect shipments from quarries and to distributors and customers. The second highest number of originations is from Uintah and Box Elder Counties and second most frequent destinations are Box Elder County, Utah and Cassia County, Idaho that likely reflect the movements of products to and from wholesalers in these important source areas. The wide scatter of non-Utah originating points is not easily explained with available information. They are presumed to be origins of cross shipments of stone moving from out-of-state yards into Utah retail yards.

Retail Market

A segment of the wholesale stone market was sampled by interviewing 121 distributors about their purchases in 2004 of a wide variety of stone products from three large Utah quarries. Large quarries produce >2000 tons annually. The interview results show the movement of 28,291 tons of stone by product type, quantity, and retail and wholesale prices from these three quarries to the distributor and the retail customers in 14 states. Quarries are identified only as A, B, or C to protect confidential data. It is not known if the results can be reasonably extrapolated to reflect the remaining market. The advantage is that the market data of the three quarries includes the interstate distribution of nearly one-third, or 31 percent, of stone produced from Utah in 2004. Figures 4, 5, and 6 summarize transportation cost, transport distance, market preferences, and quantity of stone purchased in 2004. The reselling (retail) and wholesale prices paid to quarries are addressed in the second section.

These data reveal that flagstone and ledge stone represents more than 90 percent of purchases, and flagstone is commonly hand-split, sorted by slab size and thickness, and sold of a per-ton basis. The remainder of purchases consists of crushed rock (aggregate), irregular-sized (random) blocks, and boulders. Quarries B and C produced only hand-split flagstone, while quarry A produces a mixture of flagstone, aggregate, random blocks, and boulders.

The average relationship between all symbolized points on this graph of US dollars per short ton versus distance in miles in figure 4 is shown by the fit line (dashed line) of the least squares equation of $y = 0.059x$ and by its variance $R^2 = 0.7783$. This means the average transportation cost is $0.059 per ton per mi based on data obtained from 53 respondents of the 121 distributors. Distributor locations are symbolized by state and distance in the graph. Distributors located in six states (Arizona, California, Idaho, Montana, Oregon, and Washington) cluster in the lower left of the graph at an average distance from the quarry of 749 mi and at an average cost of $47.88 per short ton. Using the least squares equation shown here, the cost of transport per ton can be determined when the distance in miles is known. For example, at 1000 miles, the cost is 1000 mi X $0.059 per ton per mi = $59/ton. The degree of correlation (R, the correlation coefficient is the square root of R^2) between miles and dollars per short ton can also be determined as the square root of the variance. In this case, the correlation coefficient, $R = .7783^{0.5} = 0.88$. The value 0.88 indicates a very high correlation because a perfect correlation is equal to 1.0.

The usual shipment size from these three quarries is twelve pallets, or 24 tons of flagstone loaded on a flat bed semi-truck-trailer. If crushed rock is shipped the shipment size is 20 tons per truck load. Stone is sold at and shipped on a f.o.b. (free-on-board) basis from the quarry, as the transportation is arranged and paid by the retail distributor.

Stone was shipped as far east as Maine and southern Florida, a distance of 2500 mi, and as far west as Hawaii, a distance of 2900 mi. In one extreme case, a Hawaii retailer re-shipped flagstone to a customer in Guam. In this case, stone was trucked to a nearest port and transferred to 20-ton shipboard containers for the oversea distance.

The histogram in figure 5 expresses the number of distributors responding and who made purchases in 2004 by

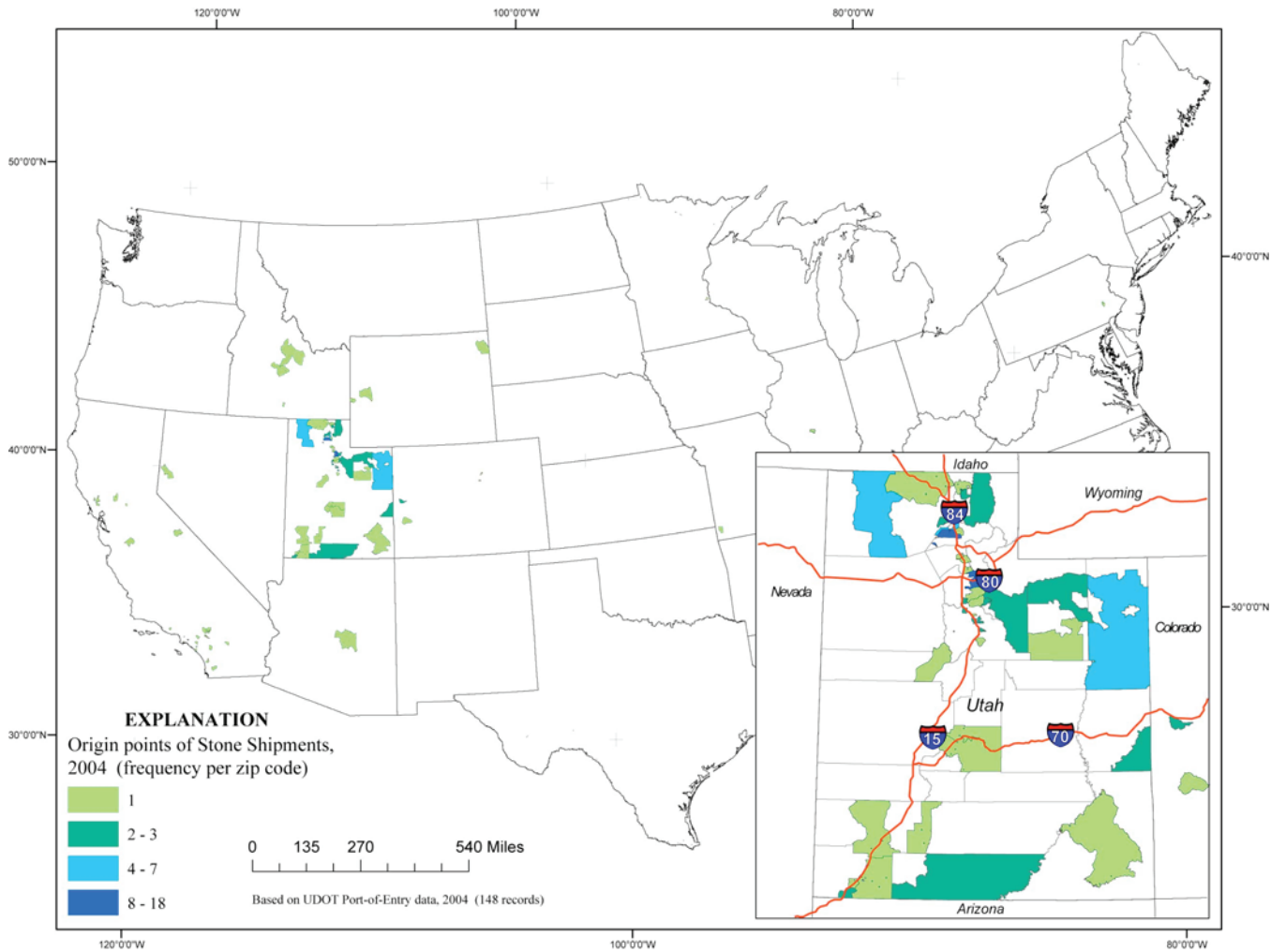

Figure 2. *Map showing origin points for selected Utah stone shipments in 2004 located by zip code. The map shows the port-of-entry data for Utah for 148 shipments of stone by truck originating from various points. These shipments are thought to represent only a small percentage of the total shipments. Source: UDOT*

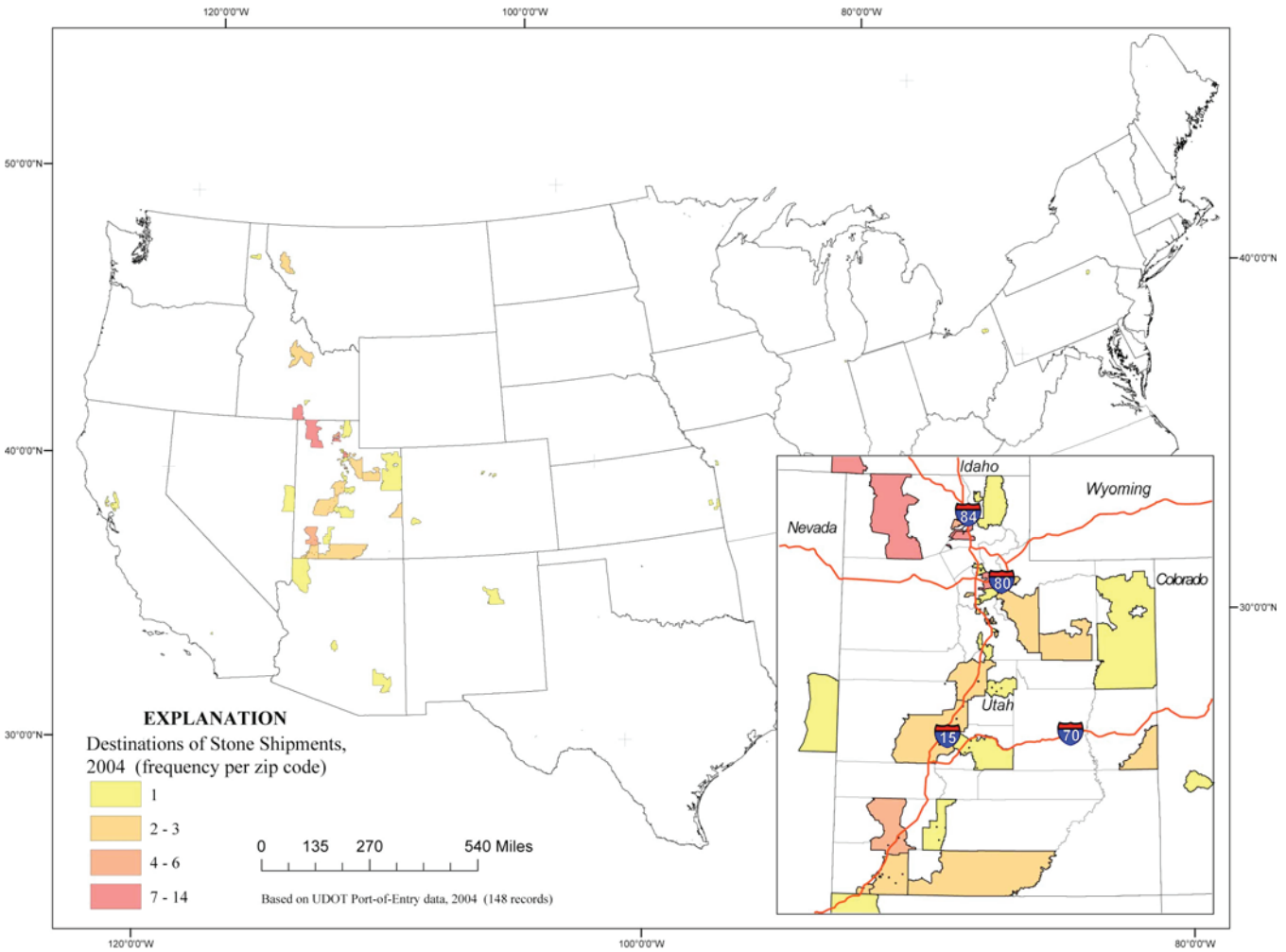

Figure 3. *Map showing destination points for selected stone shipments in 2004 located by zip code. The map shows the destination points for 148 shipments of stone by truck recorded at ports-of-entry in Utah. The shipments may or may not have originated in Utah. Source: UDOT*

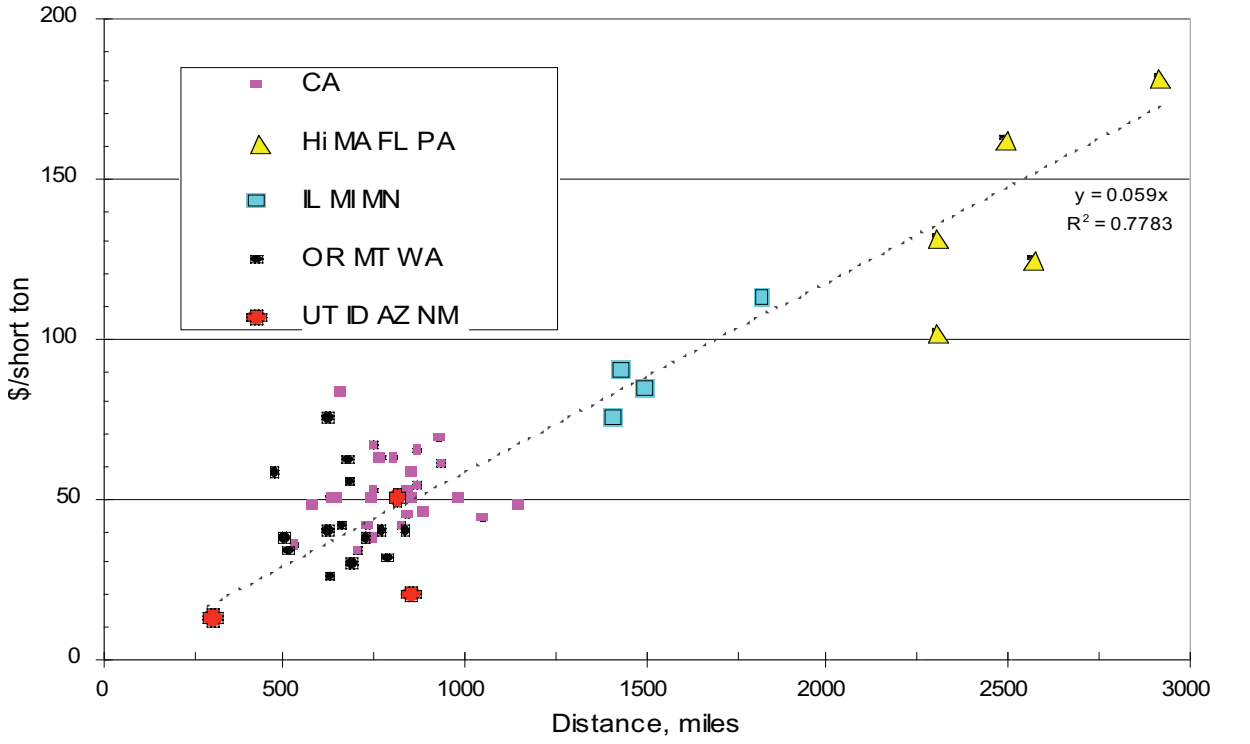

Figure 4. *Transportation cost of Utah building stone from three quarries (A, B, or C) to locations of retail distributors in 14 states. State abbreviations are AZ-Ariz., FL-Florida, ID-Idaho, IL-Illinois, HI-Hawaii, MA-Massachusetts, MI-Michigan, MN-Minnesota, MT-Montana, NM-New Mexico, OR-Oregon, PA-Pennsylvania, UT-Utah.*

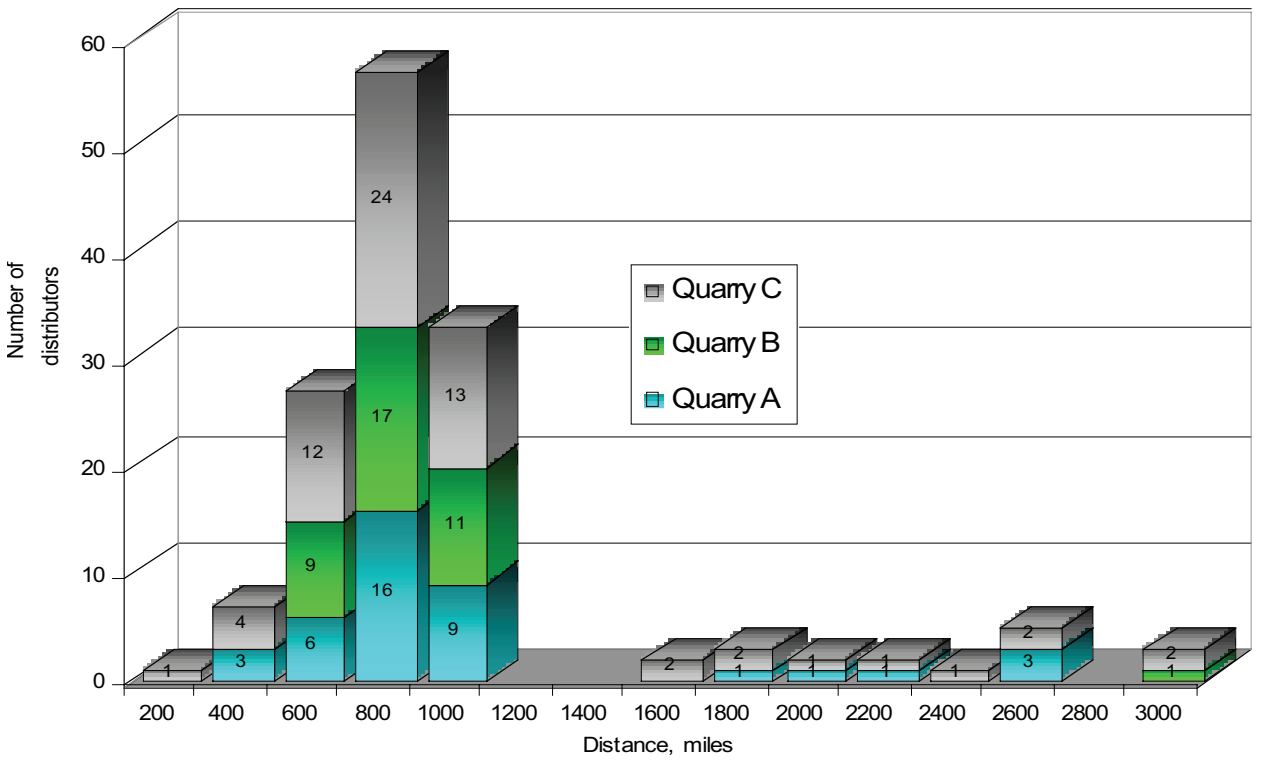

Figure 5. *Number of retail distributor purchases of Utah building stone in 2004 compared to the transport distance from each of three quarries (A, B, and C). See text for explanation. The data in the graph is read as follows, starting with the 200-mi-class: One retail distributor located at a distance between 0 mi and 200 mi purchased stone from Quarry C; for the 400-mi-class: Four retail distributors located at a distance between 200 mi and 400 mi purchased stone from Quarry C and three retail distributors located at a distance between 200 mi and 400 mi purchased stone from Quarry A.*

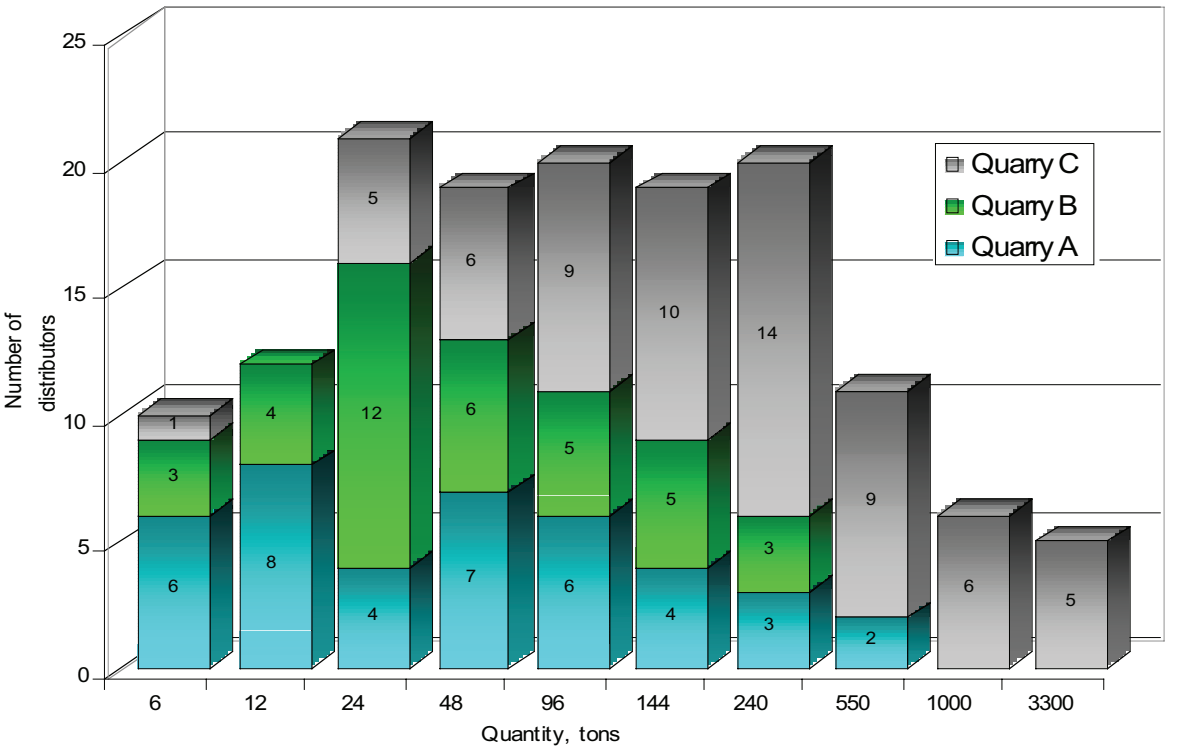

Figure 6. *Number of retail distributor purchases of Utah building stone with respect to the quantity purchased in 2004 from each of three quarries (A, B, and C). The data in the graph is read as follows, starting with the 6-tons-class: One retail distributor made a purchase of 6 tons or less from quarry C; three retail distributors made purchases of 6 tons or less from quarry B; and 6 retail distributors made purchases of 6 tons or less from quarry A; in the second class of 6 to 12 tons: four retail distributors made purchases of 6 to 12 tons from quarry B; and 8 retail distributors made purchases of 6 to 12 tons from quarry A.*

their respective distances from quarries A, B, or C. For example, of respondents in the 600- to 800-mi distances from quarries, shown by the 800-mi class, sixteen purchased from quarry A, seventeen from quarry B, and twenty-four from quarry C. "Purchases" used here means the total of all purchases made by the distributor during 2004. Distributors purchasing 76 percent of the stone, lie in the range from 400 to 1,000 mi and are located, by decreasing order, in California (52 percent), Oregon (18 percent), Montana (10 percent), Washington (7 percent), Colorado (5 percent), Nevada (3 percent), Idaho (3 percent), and Arizona (2 percent).

The chart in figure 6 summarizes the number of distributors purchasing stone according to the total quantity they purchased in 2004 from each of the quarries. Here, the vertical axis represents the number of distributors who purchased from the quarries, and each colored block along the horizontal axis represents the number of distributors purchasing from quarry A, B, or C categorized by the total quantities they purchased in 2004. The median of distributor total purchases in 2004 is 68 tons and the average is 197 tons. Sixty-five distributors purchased flagstone from quarry C in 2004 with a median purchase of 158 tons and average of 361 tons, the largest average of purchases, while 38 distributors purchased flagstone from quarry B with a median purchase of 26 tons and an average of 55 tons, the smallest average of purchases. For example, of those distributors purchasing from 48 to 96 tons (labeled as 96 ton class) during 2004, six distributors purchased from quarry A, five purchased from B, and nine from quarry C.

Further analysis of the data provided the following additional information: For quarry C, purchases of flagstone by distributors of 240 tons or larger comprise 80 percent of their purchases from quarry C. For quarry B, purchases of flagstone by distributors of 48 tons or larger comprise 80 percent of their purchases from quarry B. For quarry A, that supplied a mixture of products, purchases by distributors of 60 tons or more represent 80 percent of their purchases from quarry A.

Most of the 2004 distributors' purchases ranged from 12 to 240 tons, or 69 percent. The three largest purchases were from California and ranged from 2360 tons to 3300 tons.

COST, REVENUE, PRICE, AND PRODUCTION

In the following section, relationships of cost and revenue with the production rate are examined (demand factors) from an example of one operating stone quarry in Box Elder County in northwest Utah. The name is not disclosed to protect confidential information. These common financial relationships are applied later in this section to the analysis of operating cost, wholesale price, and retail price experienced at other quarries encountered in this study. The reason to investigate demand factors relates to the insight they provide about the economics of stone products.

Capital and operating costs, wholesale and retail prices, and production rates are interrelated demand factors. For example, the wholesale price at which a quarry sells stone

must vary in rough proportion to the operating cost. The wholesale price must be set at a substantial level above the operating cost to account for operating costs, capital costs, and profit, and so, for similar reasons, the retail price also varies in proportion to the wholesale price.

Typical cost categories are capital cost and operating cost. Capital costs are long-term expenditures often made prior to startup of quarry operations, such as the purchase of land and equipment or those expenditures that serve several operations; such costs may be indirectly related to direct quarrying operations. From a tax standpoint, capital costs may be amortized or depreciated over a period of years, whereas operating costs may be expensed in the year incurred.

Operating costs are expenditures made as a result of the production of stone and directly related to the operation of the quarry. Examples are fuel, lube, equipment maintenance, labor, pallets, wire and related materials, contract mining, and leased or rented equipment. Sometimes operating costs are subdivided into two categories of variables (fuel, labor, materials, etc.) and fixed (subsistence, insurance, administrative, and overhead) costs.

Typical price categories are wholesale price and retail price. The wholesale price is the price set for a commodity by the quarry operator at a level sufficiently above the operating cost in order to account for taxes, depreciation, profit, capital cost and amortization. The wholesale price is the price paid by the retail distributor to the quarry. The retail price is the price set by the distributor at his retail location and paid by retail customers. The retail price includes the product cost and transportation cost from quarry to retail site and a second tier, distributor's profit. It is unknown if sales tax is included in this amount. A production or ad valorem tax is not included since Utah does not assess these taxes on stone quarry production.

Cost-Revenue-Production Example

A hypothetical relationship of cost, revenue, and production rate for a Utah flagstone quarry demonstrates how profit varies with production rate of the operation (figure 7). Commonly known as breakeven analysis (McGuigan and Moyer, 1986, p. 355-362), this relationship is a valuable business planning tool that can be easily applied to determine relative profitability of a quarrying operation. For this example, the operating cost of $75 per ton, selling price (revenue) of $150 per ton, and production rate of 700 tons annually represent actual values from an operator in northwest Utah. The capital cost of $20,000 was estimated by the author. Accordingly, the revenue equation (solid line), R, is equal to $150 per ton times production rate, t in tons. The cost equation (dashed line), C, is equal to $75 per ton times production rate, t, plus the capital cost of $20,000, as follows:

$$R = 150t \quad (1)$$
$$C = 20{,}000 + 75t \quad (2)$$

The breakeven point in tons can be determined by setting equation R equal to equation C and solving algebraically for tons, t (see example in figure). The computed breakeven point for this example is 266.7 tons, annually. Locating the production rate of 266.7 tons on the horizontal axis of the graph gives the breakeven cost (and the breakeven revenue) of $40,000 on the vertical axis. The breakeven point is where revenue equals the total cost, equal to the sum of capital and operating cost, or the point at which both total cost and revenue are both equal to $40,000. This means that the quarry would operate profitably (above the breakeven point) only if operated at an annual production rate of more than 266.7 tons, or above a revenue of $40,000. Using this relationship, the cost, revenue, and profit can be predicted at any produc-

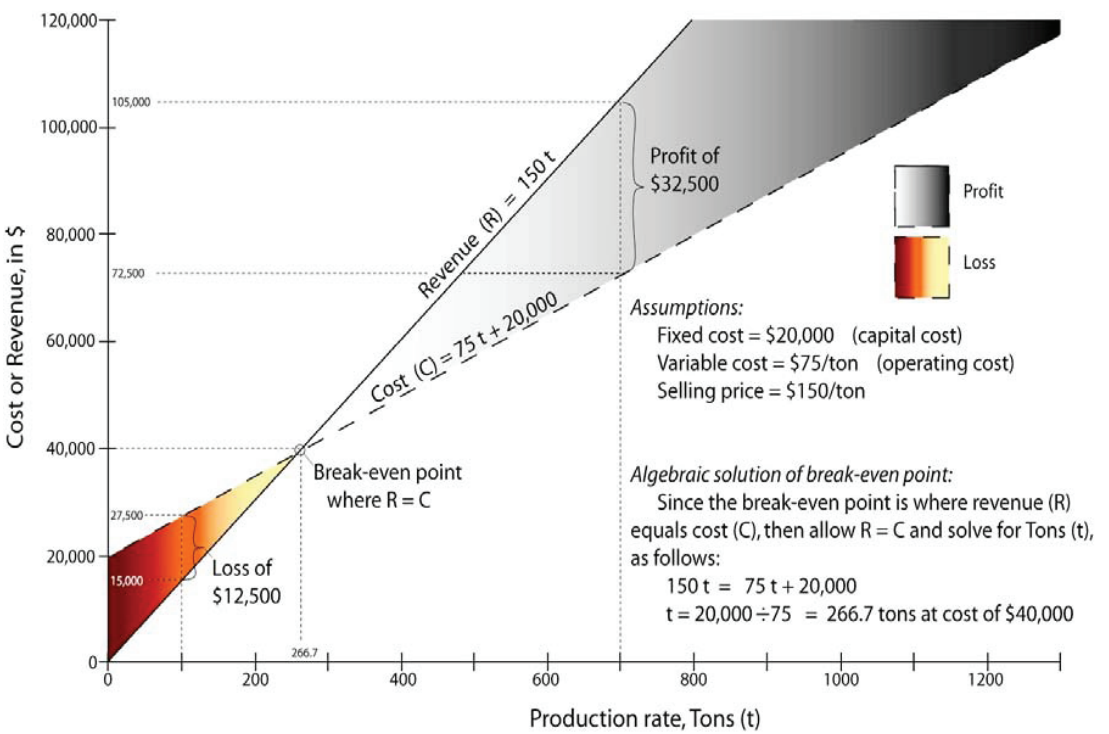

Figure 7. *Hypothetical relationships of cost, revenue, and production rate of a flagstone quarry in northwest Utah in 2004.*

tion level. The profit at a production rate of 700 tons annually, for example, is the difference between the cost and revenue determined from equations (1) and (2), or $32,500, as computed as R minus C (5):

$$R = 150 \times 700 = 105{,}000 \quad (3)$$
$$C = 20{,}000 + (75 \times 700) = 72{,}500 \quad (4)$$

And profit is calculated as R minus C,
So, Profit = 105,000 – 72,500 = 32,500 (5)

Similarly, operating at a level of 100 tons annually would produce a $10,000 loss. The cost-revenue-production functions have other applications beyond predicting profit. They can be used to set appropriate selling price when faced with competition. The optimum operating cost (and profit) can be better understood with knowledge of capital cost and changing operations parameters. The cost and revenue equations will differ from operation to operation and from year to year. Knowledge of what factors separately constitute capital and operating costs permits a quarry owner to monitor or "fine tune" those costs in order to optimize profit.

Operating Cost and Wholesale Price

Wholesale and retail price data were obtained from 69 of the 121 retail distributors located in 12 states of Arizona, California, Florida, Hawaii, Idaho, Kansas, Montana, Nevada, Oregon, Michigan, Utah, and Washington. that distribute stone from the three quarries discussed earlier.

Operating cost data is aggregated from sales flyers, retailer interviews, and market data obtained by the author and others. Data represents 86 operations located in five states (Arizona, Nevada, Utah, Washington, and Wyoming) (Rentmeister, 2004; Gardner, written communication, 2004; and this report). (see appendix 3 for data). These distributors and operations are unrelated to "yards" or "quarries" or to the retail distributors from the three quarries mentioned earlier in this report.

The hypothetical equations explained in the previous section can be recast so that the relationships of operating cost, wholesale price, and production rate are examined in separate graphs. In the first example, the operating cost versus wholesale price are presented for five different types of stone products as follows (figure 8): (1) Dimension stone, or stone with value-added processing, (2) hand-split flagstone, (3) stone collected by hand at surface, (4) crushed stone or aggregate, and (5) a specialty boulder product. Dimension stone forms a two point group well above the linear least squares trend line (dashed line) and crushed stone, specialty boulders, and surface-collected stone fall below the least squares trend line as one would expect. The least squares trend line for all these types of stone shows a reasonably good correlation between operating cost and wholesale price based on the correlation coefficient of R = 0.47. This least-squares relationship of y= 0.448 x shows that the operating cost is 0.448 times the wholesale cost, or that operating cost is 44.8 percent of the wholesale cost.

Two points in the upper right corner predictably represent the higher-cost dimension stone products which sell at a higher wholesale price due to the processing. To create dimension stone, operators re-size mine-run flagstone to a consistent size using a trimming device (e.g. cris cutter) to create a product with certain dimensions. Three points representing three different lower cost products occur on the lower part of the diagram well below the trend line. These points include: (1) a crushed aggregate product from Bright quarry (122 in stone_sites.txt), on the lower left, (2) a quarried specialty boulder product, Columbia Quartzite (69), on the lower right side at a wholesale price of $225 per ton, and (3) a surface-collected stone, Wyoming Stone (133), that lies between them at about $180 per ton. The last three stone products understandably have lower operating costs than the average, as expected.

Wholesale and Retail Price

The graph in figure 9 illustrates the retail price-versus-wholesale price relationship for four products from the three quarries: aggregate, boulders, ledgestone, and flagstone. The relationship forms three regions separated principally by wholesale price: (1) aggregate is low-priced and found on the left side at a wholesale price below $50 per ton, (2) flagstone is high-priced and found on the right side mainly above a wholesale price of $200 per ton, whereas (3) boulders, ledgestone, and random stone are mixed in the medium-priced region between $50 and $200 per ton. The least-squares trend line (dashed line) for the composite stone data expressed by the equation:

$$Y = 1.0156x + 179.72 \quad (6)$$

and the variance, $R^2 = 0.4224$ (7)

show that retail price and wholesale price of the composite stone quarry data are well correlated with a correlation coefficient of:

$$R = (0.4224)^{0.5} = 0.65 \quad (8)$$

The least squares equation (6) shows there exists a 1:1.02 relationship of wholesale to retail price after adding $179.72 per ton to the wholesale price. Such a relationship is reasonable since it corresponds with the lowest price for aggregate and the highest price for flagstone. The difference of $179.72 per ton is readily interpreted as the markup added to the average wholesale price to establish an average retail price. One distributor interviewed expressed a simple method he uses to determine the retail price equal to double of the wholesale price plus the cost of transportation. An additional 25 percent of the wholesale price is selectively added to the retail price to account for superior quality of product, its scarcity, and its relative demand.

Prices obtained from 69 retail distributors in 12 states of: Arizona, California, Florida, Hawaii, Idaho, Kansas, Montana, Nevada, Oregon, Michigan, Utah, and Washington. Prices on the chart form three regions with aggregate products below a wholesale price of $50 per ton, flagstone above $200 per ton, and boulders or ledge stone (random stone) between these price levels. The alignments of several symbols along a vertical line (e.g. flagstone at wholesale price of $225, $275, and $325) are due to the use of scheduled price provided by the quarry of each product that are priced differently by various distributors.

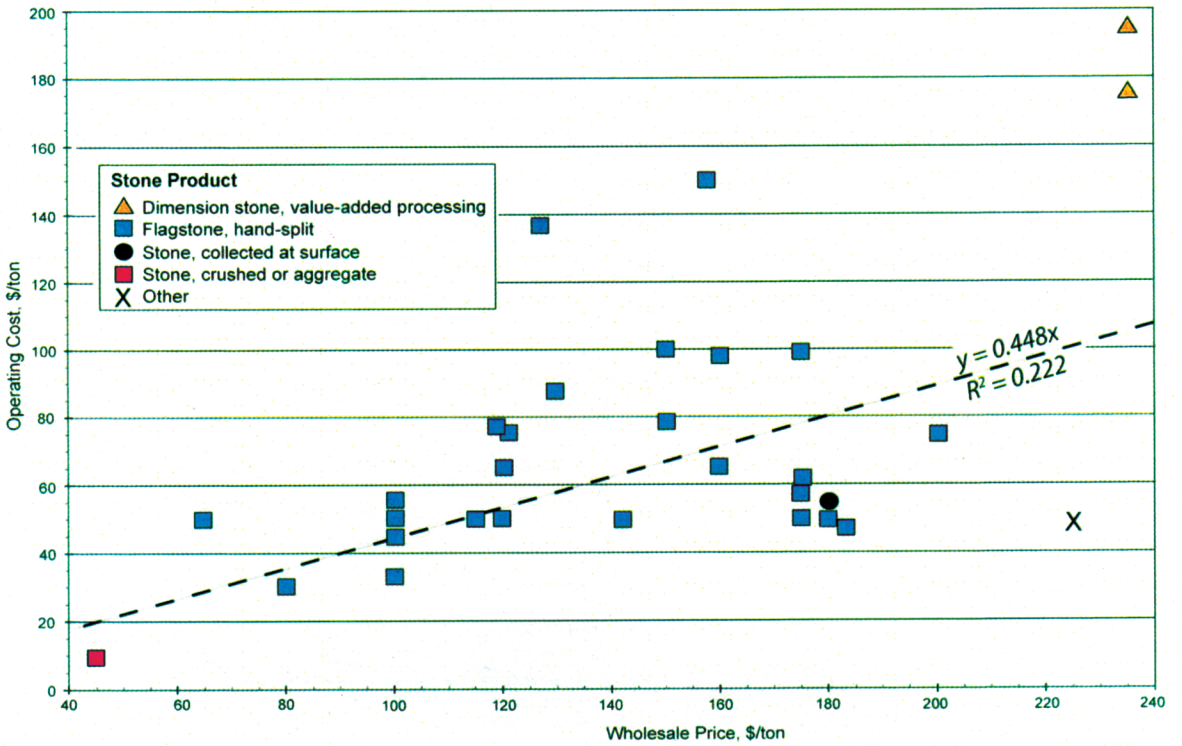

Figure 8. *Comparison of operating cost and wholesale price for five types of building stone quarry products. The least squares trend line is an average of all types of stone in the figure.*

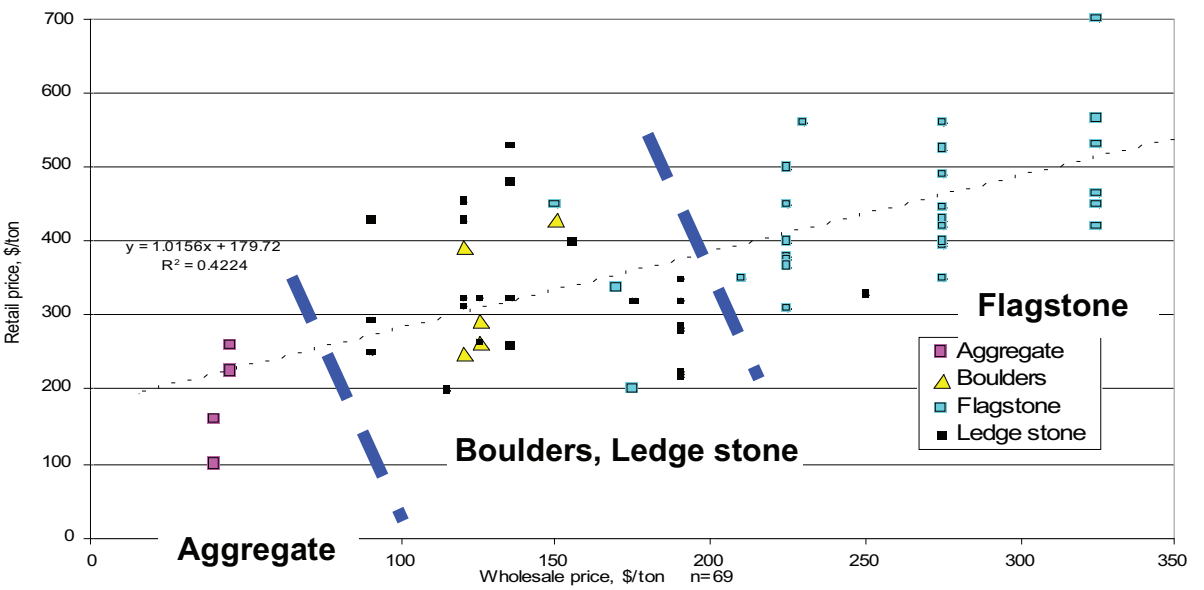

Figure 9. *Retail price compared to wholesale price for aggregate, boulders, flagstone, and ledge stone.*

Marketability Model

The foregoing section suggests a method useful for examining the relative marketability of stone by which any of five types (or any number) of stone products can be segregated by their unique combinations of cost and production rate because these factors show a predictable relationship between operating cost, wholesale price, and production rate. The method demonstrates the relative differences between products (according to their prices, costs, and quantities) on X-Y graphs. The differences between the individual product types can be understood by returning to the original hypothetical revenue and cost equations from the previous section. The graph in figure 10a compares the five types of stone products by wholesale price and production rate, as follows: dimension stone, hand-split flagstone, surface-collected stone, crushed stone, and other (or specialty boulders). A least squares line is impractical due the mixture of five product types; instead, the like symbols represent the product types and form groups in different regions of the chart despite the sparse data. Dimension stone is in the upper price region; surface-collection stone lies in the lower cost area (left), crushed stone is in the lowest cost part of the graph, and hand-split flagstone is widespread but lies between these regions. It is convenient to create boundaries (dash lines) to separate each of the groups from one another (figure 10b).

The low production rate and lower average wholesale price for surface-collected stone is due to its sparse availability and ease of collection. Since excavations are disallowed for surface-collected stone, workers must scavenge to locate usable product on the surface. The spread of data points also reflects the occasional presence of surface stone in copious amounts at one location. Where hand-split flag-

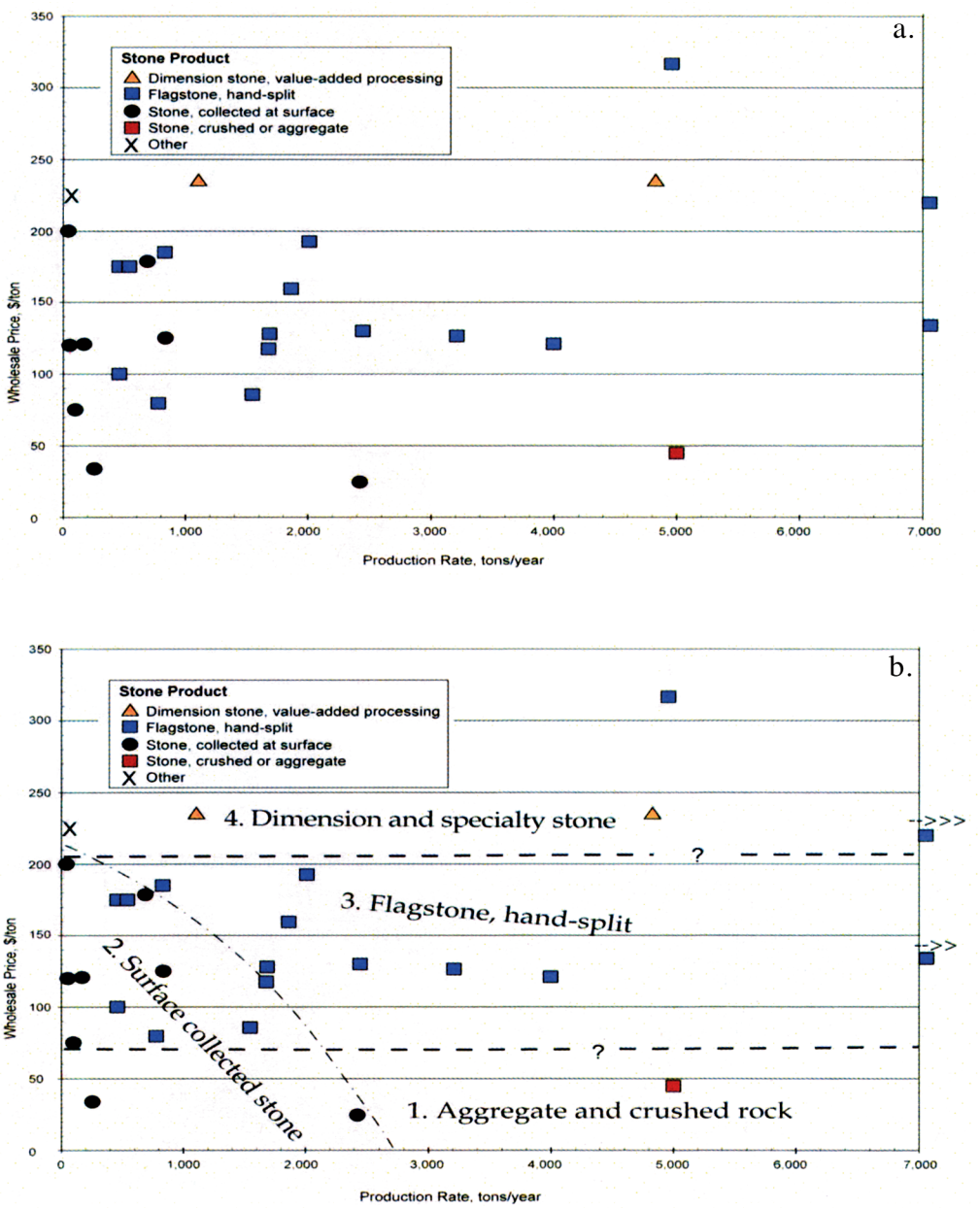

Figure 10. *Comparison of wholesale price and production rate for differing types of quarry products: a. Graph shows the relationship of five types of stone products; b. Boundaries (dash line) are drawn to indicate a unique region on the graph to represent each product. See text for explanation.*

stone is quarried, a large workforce can be assembled at one location permitting a greater amount of stone to be quarried and processed. The quantity of flagstone produced has a direct relation to the number of workers and the degree of mine mechanization. Only one point is available to represent crushed aggregate, where a large quantity is produced at very low cost. The dimension stone is produced at a higher price due to its higher unit cost of production and market demand. Boundaries on this diagram separating some types of stone are more or less tenuous than others, depending on data available to support each group. For example, if additional data were available, the upper limits for flagstone and aggregate could be better defined from the group with a higher operating cost per ton.

Two points representing very large operations fall far to the right and outside the scale of this illustration, yet their operating costs per ton place stone from these operations within the hand-split flagstone boundary. These two operators are not disclosed but produce stone at a production rate 36,000 tons per year and 14,000 tons per year.

A final example, similar to the relationship just discussed, is the relationship between operating cost and production rate for the five types of stone products (figure 11). These groups fall into the approximate positions, as in the previous illustration, leading to the conclusion that the five stone products maintain consistent demand relationships with regard to price, cost, and production rate. Again, boundaries are drawn to separate each like group of symbols. Dimension stone occupies the upper part, aggregate and crushed rock are near the bottom, surface-collected stone is in the lower left, and hand-split flagstone occupies a large middle area. The data point for specialty boulders (other) lies within the region with surface-collected stone. The two graphs (figs. 10-11) may be used interchangeably for an improved understanding of the marketability of these products.

CONCLUSIONS

Utah building stone quarry workers spent 281,605 hours on the job in 2004, an increase of 53 percent over levels in 2002. Utah's average worker year was 34.7 weeks or 1,387 hours. Increases in employee hours from 2002 to 2004 in Idaho, Montana, and Washington were 68 percent, 87 percent, and 75 percent, respectively. The larger increase in hours worked and the increase in the number of employees over the 2002-2004 period in each state is consistent with the increase in tons of stone produced. The average productivity of quarry workers in Utah was 3.1 hours per ton of stone.

Utah port of entry records, although incomplete, indicate that Utah stone shipments move to locations mainly found in the western states and from regions of important stone production.

One hundred twenty-one distributors provided retail market information about the movements through wholesale-to-retail markets of stone from three Utah quarries. The three quarries produce a mixture of flagstone, ledge stone, boulders, and aggregate. These distributors are located in 12 states, some up to 2900 miles and as far away as Hawaii, Maine, and Florida. They purchased and resold 28,291 tons, equal to 31 percent of all stone quarried in Utah in 2004. Most of this stone, or 76 percent, was sold to distributors 400 to 1,000 mi from quarries, to retail locations in (by decreas-

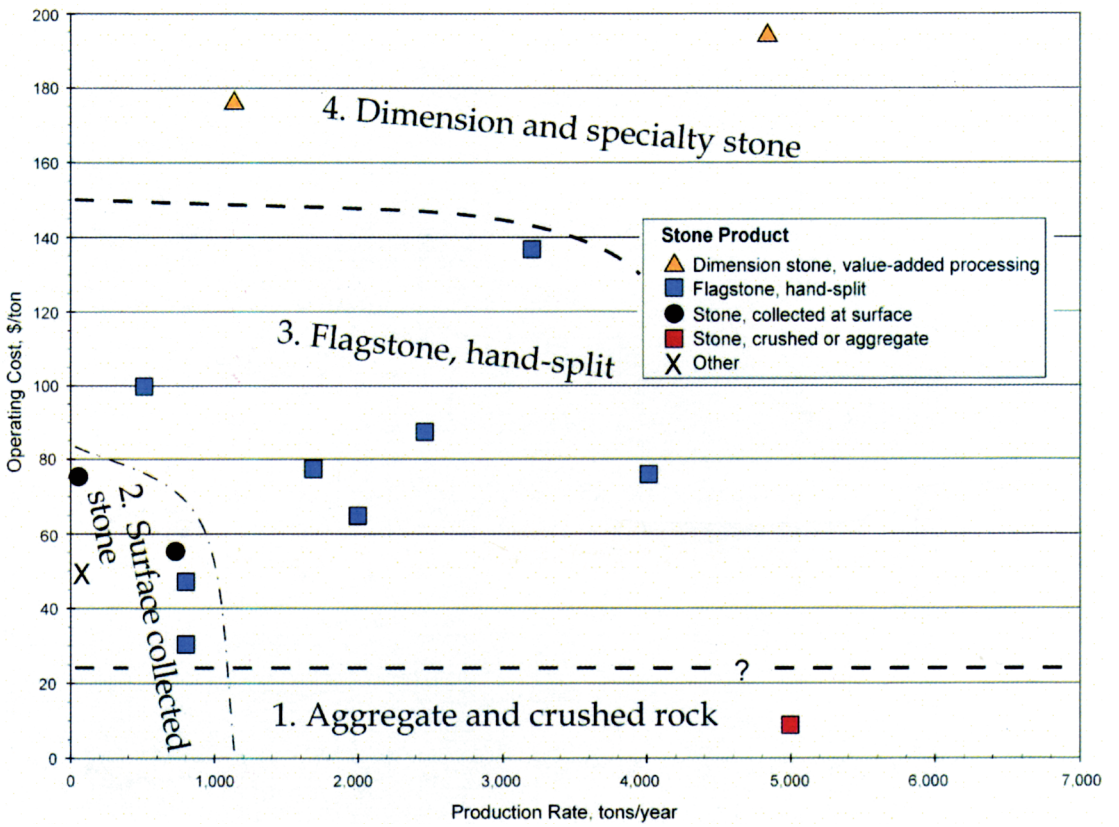

Figure 11. *Types of building stone quarrying operations identified by comparison of operating cost and production rate.*

ing order) California (52%), Oregon (18%), Montana (10%), Washington (7%), Colorado (5%), Nevada (3%), Idaho (3%), and Arizona (2%). The average purchase by a distributor was 197 tons. The largest three customers, located in California, purchased from 2360 to 3300 tons in 2004.

Twenty-four tons per load, or 12 pallets, is the normal transported load from a quarry to a retail site by tractor-trailer truck. Transport cost averages about $0.059 per ton per mile based on data obtained from 53 retail distributors. Distributors located in six states (Arizona, California, Idaho, Montana, Oregon, and Washington) at an average distance from the quarry of 749 mi have an average transportation cost of $47.88 per short ton.

The factors of cost, revenue, and production rate of stone operations, used to determine breakeven point, form a useful relationship to monitor costs and optimize profits.

Predictable relationships ranging from good to excellent are formed between operating cost, wholesale price, retail price, and production rate for hand-split flagstone, dimension stone, surface collected stone, crushed stone, and other stone. The least squares trend lines show that operating cost averages 44.8 percent of the wholesale price of a variety of stone types, and similarly, that there exists a 1-to-1.02 linear relationship between wholesale price and retail price of the composited quarry data of all types of stone after adding the difference of $179.72 per ton to the wholesale price to obtain the retail price. This difference added by the retail is the markup.

Useful predictive relationships are also observed in comparisons of both wholesale price and operating cost with production rate for several groups of stone products. These groups consist of dimension and specialty stone, aggregate, surface collected stone, and flagstone. These findings lead to the conclusion that the stone products maintain consistent demand relationships for use in marketability and appraisal investigations.

REFERENCES

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APPENDICES

Appendix 1 – Hourly and employment data for stone operations.

Source: U.S. Department of Labor, Mine Safety and Health Administration

Headers:
Operator
State
ID
Mine Name
Type
Commodity
Controlling company
Operator
County
Status
Address
Zip code
Employee-hours
Employees-2004
Quarters employed-2004
Employees-2004
Employees-2003
Quarters employed-2003
Employees-2003
Employees-2002
Quarters employed-2002
Employees-2002
Comments

Appendix I - Hourly and employment data (Mine Safety and Health Admin., 2004)

Operator	State	ID	Mine Name	Type	Commodity	Controlling Company
R E Miller & Sons	Montana	2402123	MOBILE CRUSHER	Surface	Dimension Stone NEC	Tom Miller
Wickens Construction Inc	Montana	2402129	PORTABLE PUG MILL	Surface	Dimension Stone NEC	Maria Durbin
Andersen Rock Sales Inc.	Montana	2402253	Murr Peaks	Surface	Dimension Stone NEC	Jacob Anderson
Glacier Stone Supply	Montana	2402354	Island Lake	Surface	Dimension Slate	David Wilkins
Glacier Stone Supply	Montana	2402353	Stoltze	Surface	Dimension Slate	David Wilkins
Montana Stone Supply Inc	Montana	2402236	MONTANA STONE SUPPLY, INC	Surface	Dimension Stone NEC	James Norvell
Montana Stone Supply Inc	Montana	2402235	MONTANA STONE SUPPLY, INC	Surface	Dimension Stone NEC	James Norvell
Ron Stanton Stone Supply	Montana	2402232	Stanton Stone Supply Inc	Surface	Dimension Stone NEC	Ron Stanton
Schellinger Sand & Gravel, Inc.	Montana	2402297	Twin Creeks	Surface	Dimension Stone NEC	Albert Schellinger
Stanton Stone Supply, Inc.	Montana	2402357	Eagle Landing	Surface	Dimension Sandstone	Ron Stanton
Stanton Stone Supply, Inc.	Montana	2402376	Herrig Creek	Surface	Dimension Stone NEC	Ron Stanton
Stanton Stone Supply, Inc.	Montana	2402364	PermaGold	Surface	Dimension Stone NEC	Ron Stanton
E S Stone & Structure	Montana	2402265	E S Stone & Structure Mobile 1, 2, and 3	Surface	Dimension Stone NEC	Eric Johnson; Scott Puppe
Washington Group International Inc	Montana	2401992	Pipestone Quarry	Surface	Dimension Basalt	Washington Group International
Fischer Construction	Montana	2402355	Fischer Quarry	Surface	Dimension Stone NEC	Dan Fischer
Jacob D Cremer	Montana	2402247	Camas Site #1	Surface	Dimension Stone NEC	Jacob Cremer
Gates Slate, Inc	Montana	2402209	Gates Slate	Surface	Dimension Slate	Lewis Morris
Gary Palmer	Montana	2402278	Rock Slide	Surface	Dimension Stone NEC	Gary Palmer
Rock Of Ages Stone	Montana	2402284	Surprise Hill	Surface	Dimension Stone NEC	Robert Orr
Rocky Mountain Rock Inc	Montana	2402335	Murr Creek	Surface	Dimension Stone NEC	Richard Lewis; Melissa Lewis
Rocky Mountain Rock Inc	Montana	2402279	Loon Lake	Surface	Dimension Stone NEC	Richard Lewis; Melissa Lewis
Rocky Mountain Rock Inc	Montana	2402347	Lower Suprise Hill	Surface	Dimension Stone NEC	Richard Lewis; Melissa Lewis
Farwest Rock, Ltd.	Montana	2402305	Farwest Rock	Facility	Dimension Stone NEC	Vernon Baston
Montana Travertine	Montana	2400016	Travertine quarry	Surface	Dimension Stone NEC	T Patrick O'Hara
T Patrick O'Hara	Montana	2400660	CUTTING & POLISHING PLANT	Surface	Dimension Stone NEC	T Patrick O'Hara
Bauer Slate and Stone	Montana	2402379	Bauer Slate and Stone	Surface	Dimension Stone NEC	Kirk Bauer
Block Mountain Slate & Stone	Montana	2402239	JUNGLE CREEK	Surface	Dimension Stone NEC	Juan Lulack
Block Mtn Slate & Stone Inc	Montana	2402331	Henry Creek	Surface	Dimension Stone NEC	Juan Lulack
Cameron A Blagg	Montana	2402366	Rainbow Mtn Stone	Surface	Dimension Stone NEC	Cameron Blagg
Dicken Stone	Montana	2402290	Hwy 28 Mine	Surface	Dimension Stone NEC	Beau Dicken
Enviro Select Stone	Montana	2402285	Enviro Select Stone	Surface	Dimension Stone NEC	Dennis Micklon
F 2 K Rock Products	Montana	2402238	F 2 K ROCK	Surface	Dimension Stone NEC	Keith Indreland; Frank Salmi
Grizzly Stone	Montana	2402287	Grizzly I	Surface	Dimension Stone NEC	Ben Kirschbaum
Jim Brown	Montana	2402090	Jim Brown	Surface	Dimension Stone NEC	Jim Brown
Perma Stone	Montana	2402248	Perma Quarry	Surface	Dimension Stone NEC	Jacob Cremer; Gene Kolb
River Traders	Montana	2402258	River Traders	Surface	Dimension Slate	Clint Gerber
Rock Solid Inc.	Montana	2402229	PARADISE	Surface	Dimension Stone NEC	Bridger Bischoff
Stone Emporium	Montana	2402237	HENRY CREEK	Surface	Dimension Stone NEC	David Ilac
Strictly Stone	Montana	2402233	Early Sunset	Surface	Dimension Stone NEC	Daniel Ilac
Strictly Stone	Montana	2402241	6mm Rainbow Lake Pass	Surface	Dimension Stone NEC	Daniel Ilac
Wild Horse Stone	Montana	2402269	McGloughlin Creek Mine	Surface	Dimension Stone NEC	Steve Blanchard
Withstone LLC	Montana	2402249	Livingstone Quarry	Surface	Dimension Stone NEC	Steven Lund
Montana Rockworks LLC	Montana	2402344	Elk Mountain	Surface	Dimension Stone NEC	Brad Mercord; Bill Carter
Montana Rockworks Llp	Montana	2402226	MC GREGOR	Surface	Dimension Stone NEC	Brad Mercord; Bill Carter
Montana Rockworks LLP	Montana	2402222	CASTLE ROCK	Surface	Dimension Slate	Brad Mercord; Bill Carter
Cloverdale Nursery & Turf Farm Inc	Idaho	1002009	Portable Plant #1	Surface	Dimension Sandstone	Hans Borbonus

Appendix I - Hourly and employment data (Mine Safety and Health Admin., 2004)

Operator	County	Status	Address	Zip Code	Employee Hours-2004
R E Miller & Sons	Beaverhead	Intermittent	15 Ramshorn Dillion, MT	59725	1955
Wickens Construction Inc	Fergus	Intermittent	Lewistown, MT	59457	3064
Andersen Rock Sales Inc.	Flathead	Intermittent	100 Sickler Rd, Marion, MT	59925	6467
Glacier Stone Supply	Flathead	Intermittent	3020 Hwy 2 East Kalispell, MT	59903	873
Glacier Stone Supply	Flathead	Intermittent	3020 Hwy 2 East Kalispell, MT	59903	2975
Montana Stone Supply Inc	Flathead	Intermittent	Marion, MT	59925	0
Montana Stone Supply Inc	Flathead	Intermittent	Marion, MT	59925	12810
Ron Stanton Stone Supply	Flathead	Intermittent	976 2nd St NW Columbia Falls MT	59912	4286
Schellinger Sand & Gravel, Inc.	Flathead	Intermittent	250 Truck Route, Columbia Falls, MT	59912	14916
Stanton Stone Supply, Inc.	Flathead	Intermittent	3154 Hwy 2 E., Kalispell, MT	59901	1391
Stanton Stone Supply, Inc.	Flathead	Intermittent	3154 Hwy 2 E., Kalispell, MT	59901	617
Stanton Stone Supply, Inc.	Flathead	Intermittent	3154 Hwy 2 E., Kalispell, MT	59901	3413
E S Stone & Structure	Golden Valley	Intermittent	110 2nd Ave. W. Ryegate, MT	59074	41662
Washington Group International Inc	Jefferson	Intermittent	91 South Main, Soda Springs, MT	83276	17752
Fischer Construction	Lake	Intermittent	91489 US Hwy 93 Lakeside, MT	59922	3743
Jacob D Cremer	Lake	Intermittent	612 Central Ave. Hot Springs, MT	59845	4530
Gates Slate, Inc	Lewis and Clark	Intermittent	25 mi N. of Helena, MT	59604	28813
Gary Palmer	Lincoln	Intermittent	117 Jack Pine Drive, Kalispell, MT	59901	No records
Rock Of Ages Stone	Lincoln	Intermittent	381 Wards Rd, Libby MT	59923	15288
Rocky Mountain Rock Inc	Lincoln	Intermittent	255 Pioneer Rd, Kalisipell, MT	59901	6819
Rocky Mountain Rock Inc	Lincoln	Intermittent	255 Pioneer Rd, Kalisipell, MT	59901	864
Rocky Mountain Rock Inc	Lincoln	Intermittent	255 Pioneer Rd, Kalisipell, MT	59901	41
Farwest Rock, Ltd.	Missoula	Intermittent	1100 North View Drive, Missoula, MT	59803	37
Montana Travertine	Park	Intermittent	1106 W. Park #410 Livingston, MT	59047	*60*
T Patrick O'Hara	Park	Intermittent	1106 W. Park #410 Livingston, MT	59047	6012
Bauer Slate and Stone	Sanders	Intermittent	211 Deemer Cr Rd Plains, MT	59859	No records
Block Mountain Slate & Stone	Sanders	Intermittent	123 Lynch, Plains, MT	59859	6660
Block Mtn Slate & Stone Inc	Sanders	Intermittent	123 Lynch, Plains, MT	59859	6960
Cameron A Blagg	Sanders	Intermittent	1596 Bull River Rd., Noxon, MT	59853	480
Dicken Stone	Sanders	New Mine	Plains, MT	59859	No records
Enviro Select Stone	Sanders	Intermittent	Libby, MT	59923	500
F 2 K Rock Products	Sanders	Intermittent	1791 Highway 28 Hot Springs, MT	59845	0
Grizzly Stone	Sanders	Intermittent	Box 992 Plains, MT	59859	792
Jim Brown	Sanders	Intermittent	400 Upper Lynch, Plains, MT	59859	468
Perma Stone	Sanders	Intermittent	305 E Lane, Plains, MT	59845	1030
River Traders	Sanders	Intermittent	220 Whitetail Lane, Plains, MT	59859	No records
Rock Solid Inc.	Sanders	Intermittent	Plains, MT	59859	10864
Stone Emporium	Sanders	Intermittent	Hot Springs, MT	59845	942
Strictly Stone	Sanders	Intermittent	509 1st Av South Hot Springs, MT	59845	736
Strictly Stone	Sanders	Intermittent	509 1st Av South Hot Springs, MT	59845	777
Wild Horse Stone	Sanders	Intermittent	#3 Two Boys Lane, Plains, MT	59859	15124
Withstone LLC	Sanders	Intermittent	19020 SR 203 Monroe, MT	98272	2128
Montana Rockworks LLC	Wheatland	Intermittent	1107 Rose Crossing, Kalispell, MT	59901	3875
Montana Rockworks Llp	Wheatland	Intermittent	1107 Rose Crossing, Kalispell, MT	59901	13163
Montana Rockworks LLP	Wheatland	Intermittent	1107 Rose Crossing, Kalispell, MT	59901	7633
					250,520
Cloverdale Nursery & Turf Farm Inc	Ada County, ID	Intermittent	2528 N. Cloverdale Rd , Boise , ID 83713	83713	237

Appendix I - Hourly and employment data (Mine Safety and Health Admin., 2004)

Operator	Employees-2004	Quarters employed-2004	Employee Hours-2003	Employees-2003	Quarters employed-2003	Employee Hours-2002
R E Miller & Sons	4	4	947	4	4	575
Wickens Construction Inc	3	4	2393	4	4	3139
Andersen Rock Sales Inc.	4	4	2794	2	4	1857
Glacier Stone Supply	5	4	No records	No records	No records	No records
Glacier Stone Supply	4	2	No records	No records	No records	No records
Montana Stone Supply Inc	0	4	825	2	4	4301
Montana Stone Supply Inc	10	4	6446	8	4	8726
Ron Stanton Stone Supply	7	4	8750	10	4	2193
Schellinger Sand & Gravel, Inc.	7	4	13031	13	4	9473
Stanton Stone Supply, Inc.	9	4	No records	No records	No records	No records
Stanton Stone Supply, Inc.	4	4	No records	No records	No records	No records
Stanton Stone Supply, Inc.	5	4	No records	No records	No records	No records
E S Stone & Structure	44	4	27209	30	4	13317
Washington Group International Inc	16	4	16243	7	4	26288
Fischer Construction	4	4	No records	No records	No records	No records
Jacob D Cremer	3	4	2995	4	4	1220
Gates Slate, Inc	18	4	3115	7	1	No records
Gary Palmer	No records	No records	No records	No records	No records	No records
Rock Of Ages Stone	17	4	9945	25	3	No records
Rocky Mountain Rock Inc	8	4	No records	No records	No records	No records
Rocky Mountain Rock Inc	6	4	128	1	1	No records
Rocky Mountain Rock Inc	2	4	No records	No records	No records	No records
Farwest Rock, Ltd.	1	4	0	0	1	700
Montana Travertine	*1*	*3*	692	4	4	212
T Patrick O'Hara	5	4	6617	5	4	10291
Bauer Slate and Stone	No records	No records	No records	No records	No records	No records
Block Mountain Slate & Stone	4	4	5570	7	4	1629
Block Mtn Slate & Stone Inc	4	4	1530	3	2	No records
Cameron A Blagg	2	4	No records	No records	No records	No records
Dicken Stone	No records	No records	No records	No records	No records	No records
Enviro Select Stone	1	4	900	2	2	No records
F 2 K Rock Products	0	4	1648	2	4	1510
Grizzly Stone	2	3	250	1	1	0
Jim Brown	2	4	0	0	4	266
Perma Stone	3	4	862	3	4	773
River Traders	No records	No records	2	1	2	No records
Rock Solid Inc.	9	4	14228	10	4	17687
Stone Emporium	2	4	680	2	4	0
Strictly Stone	3	4	881	2	4	0
Strictly Stone	3	4	882	2	4	0
Wild Horse Stone	14	4	9354	11	4	13449
Withstone LLC	3	4	1875	3	4	1266
Montana Rockworks LLC	4	4	481	4	1	No records
Montana Rockworks Llp	6	4	7273	11	4	4144
Montana Rockworks LLP	5	4	8837	9	4	11005
	254	160	157,383	199	110	134,021
Cloverdale Nursery & Turf Farm Inc	2	4	721	2	4	540

Appendix I - Hourly and employment data (Mine Safety and Health Admin., 2004)

Operator	Employees-2002	Quarters employeed 2002	Comments
R E Miller & Sons	4	4	
Wickens Construction Inc	4	4	
Andersen Rock Sales Inc.	2	4	Quarry operation
Glacier Stone Supply	No records	No records	
Glacier Stone Supply	No records	No records	
Montana Stone Supply Inc	9	4	
Montana Stone Supply Inc	10	4	
Ron Stanton Stone Supply	4	4	
Schellinger Sand & Gravel, Inc.	14	2	
Stanton Stone Supply, Inc.	No records	No records	
Stanton Stone Supply, Inc.	No records	No records	
Stanton Stone Supply, Inc.	No records	No records	
E S Stone & Structure	19	4	
Washington Group International Inc	12	4	
Fischer Construction	No records	No records	
Jacob D Cremer	3	3	
Gates Slate, Inc	No records	No records	
Gary Palmer	No records	No records	
Rock Of Ages Stone	No records	No records	
Rocky Mountain Rock Inc	No records	No records	
Rocky Mountain Rock Inc	No records	No records	
Rocky Mountain Rock Inc	No records	No records	
Farwest Rock, Ltd.	1	1	Dredge and preparation plant
Montana Travertine	3	4	
T Patrick O'Hara	7	4	
Bauer Slate and Stone	No records	No records	
Block Mountain Slate & Stone	5	4	
Block Mtn Slate & Stone Inc	No records	No records	
Cameron A Blagg	No records	No records	
Dicken Stone	No records	No records	
Enviro Select Stone	No records	No records	
F 2 K Rock Products	2	4	
Grizzly Stone	0	2	
Jim Brown	3	4	
Perma Stone	2	3	
River Traders	No records	No records	
Rock Solid Inc.	12	4	
Stone Emporium	0	2	
Strictly Stone	0	1	
Strictly Stone	0	1	
Wild Horse Stone	10	4	
Withstone LLC	2	4	
Montana Rockworks LLC	No records	No records	
Montana Rockworks Llp	12	4	
Montana Rockworks LLP	13	4	
	153	87	
Cloverdale Nursery & Turf Farm Inc	2	4	

Appendix I - Hourly and employment data (Mine Safety and Health Admin., 2004)

Operator	State	ID	Mine Name	Type	Commodity	Controlling Company
Gerhard Borbonus Landscaping Inc	Idaho	1001872	Table Rock Sandstone	Surface	Dimension Sandstone	Hans Borbonus
Gillette Sharp Corporation,	Idaho	1002060	Rodriguez Quarry	Surface	Dimension Quartzite	Zane M Gillette
Idaho Travertine Corp	Idaho	1000701	Fall Creek Travertine quarry	Surface	Dimension Stone NEC	Orchard Theo R
Northern Stone Supply Inc	Idaho	1000648	Rocky Mountain Quartzite Quarry	Surface	Dimension Stone NEC	Gary N Mullard
Oakley Valley Stone Inc	Idaho	1001476	Oakley Valley Stone Inc	Surface	Dimension Stone NEC	Burch James C
Sawtooth Stone LLC	Idaho	1002037	Birch Creek Sawtooth #2	Surface	Dimension Stone NEC	Bruce Mitchell; Carl Borgstrom
Scrivanich Natural Stone Inc	Idaho	1001798	Rock Garden Quarry	Surface	Dimension Slate	Larry Scrivanich
Scrivanich Natural Stone Inc.	Idaho	1002025	Rock Ridge Quarries	Surface	Dimension Stone NEC	Larry Scrivanich
Southwest Stone LLC	Idaho	1002058	Indian Creek Quarry	Surface	Dimension Sandstone	Jeffrey L Sagers; Doug Strate
Star Stone Quarries Inc	Idaho	1001974	OAKLEY YARD	Facility	Dimension Stone NEC	Lon A Thomas
Thermocal Mines of Idaho	Idaho	1001328	Thermocal Mines of Idaho	Facility	Dimension Limestone	Harold J Wilson
Three Rivers Stone Corp	Idaho	1001672	Three Rivers Stone Corp	Surface	Dimension Slate	Scott Laine; Terry Weaver
B & H Stone Supply	Utah	4202309	B & H STONE SUPPLY	Surface	Dimension Limestone	Bryce Haas
B M W Stone Inc	Utah	4202131	Peoa Pit	Surface	Dimension Stone NEC	Willes Mark
Bonneville Quarries	Utah	4202365	Bonneville Quarries	Surface	Crushed, Broken Stone NEC	William L Bown; Elwood Preston Bown
Bonneville Quarries Inc	Utah	4202287	DOVE CREEK (PORTABLE)	Surface	Dimension Sandstone	William L Bown; Elwood Preston Bown
Bown Building Stone	Utah	4202337	Bown Building Stone	Surface	Dimension Stone NEC	Danny Bown
Feller Stone Inc	Utah	4201638	Veyo Pit	Surface	Dimension Basalt	Allen C Feller
Gold Star Stone Inc	Utah	4202298	Chocolate Charcoal Quarry	Surface	Dimension Stone NEC	Barry Peterson
Gold Star Stone Inc	Utah	4201052	Lone Pine Quarry	Surface	Dimension Stone NEC	Barry Peterson
Heritage Quarries LLC	Utah	4202323	Green Peak	Surface	Dimension Stone NEC	Dennis C Jorgensen
Mountain Valley Stone, Inc.	Utah	4202121	Mountain Valley Stone Inc	Surface	Dimension Stone NEC	Robert J Hicken; Paul R Ballif
Northern Stone Supply Inc	Utah	4202289	LIMELIGHT QUARRY	Surface	Dimension Sandstone	Gary N Mullard
Northern Stone Supply Inc	Utah	4202290	TURQUOISE STONE QUARRY	Surface	Dimension Stone NEC	Gary N Mullard
Penney's Gemstones	Utah	4202322	Penney's Gemstones Portable	Surface	Dimension Stone NEC	Penney, David
Rocanville Corporation	Utah	4202329	BLACK ROCK #1	Surface	Dimension Limestone	Hudson William
Rocanville Stone	Utah	4202345	North Canyon Quarry	Surface	Crushed, Broken Stone NEC	HAMILTON, M W
Rock Products Of Utah Inc	Utah	4202137	QUARRY 1	Surface	Dimension Sandstone	Wurth, Develon
Sawtooth Stone LLC	Utah	4202364	Sawtooth #1	Surface	Dimension Stone NEC	Bruce Mitchell; Carl Borgstrom
Star Stone Quarries Inc	Utah	4202110	PEOA QUARRY	Surface	Dimension Limestone	Lon A Thomas
Star Stone Quarries Inc	Utah	4201950	Portable 3, Cotton Thomas Quarries	Surface	Dimension Limestone	Lon A Thomas
A & B Rock Distributers LLC	Washington	4503513	Serenity Mine	Surface	Dimension Slate	Dan Gustafson
Dolphin Bay Quarry	Washington	4503251	DOLPHIN BAY QUARRY	Surface	Dimension Traprock	John Johnson
Granite Products LLC	Washington	4503567	Granite Products LLC	Surface	Dimension Stone NEC	Craig Powell
Marenakos Inc	Washington	4503445	TENINO	Surface	Dimension Sandstone	Brownworth Robert
Montana Rock Products, Inc.	Washington	4503508	Iron Mountain Quarry	Surface	Dimension Stone NEC	Glen Vergeront
Northwest Marble Products Inc	Washington	4500808	WHITE QUARRY	Surface	Dimension Limestone	Ernest Smith
Penny Creek Quarry	Washington	4503356	Penny Creek Quarry	Surface	Dimension Traprock	Gary Phillips
Quality Rock Products Inc	Washington	4503438	Little Rock Site	Surface	Dimension Stone NEC	De Atley Neil and Randy
White Stone Calcium Inc	Washington	4503529	Chewelah Plant	Surface	Dimension Marble	Donald Grubb

Appendix I - Hourly and employment data (Mine Safety and Health Admin., 2004)

Operator	County	Status	Address	Zip Code	Employee Hours-2004
Gerhard Borbonus Landscaping Inc	Ada County, ID	Intermittent	2251 Empire Way , Boise , ID 83709	83709	1668
Gillette Sharp Corporation,	Cassia County, ID	Intermittent	120 S. 100 W. , Burley , ID 83318	83318	No records
Idaho Travertine Corp	Bonneville County, ID	NonProducing	3935 N Yellowstone Highway , IDAHO FALLS , ID 83401	83401	945
Northern Stone Supply Inc	Cassia County, ID	Intermittent	203 W. MAIN , OAKLEY , ID 83346	83346	16980
Oakley Valley Stone Inc	Cassia County, ID	Intermittent	204 West Main St , Oakley , ID 83346	83346	21383
Sawtooth Stone LLC	Cassia County, ID	Intermittent	2104 South 100 East , Oakley , ID 83346	83346	5290
Scrivanich Natural Stone Inc	Cassia County, ID	Intermittent	1729 S. Hwy 27 , Oakley , ID 83346	83346	57702
Scrivanich Natural Stone Inc.	Cassia County, ID	Intermittent	1729 S. Hwy 27 , Oakley , ID 83346	83346	10792
Southwest Stone LLC	Bear Lake County, ID	Intermittent	2421 West 350 North , Hurricane , ID 84737	84737	2976
Star Stone Quarries Inc	Cassia County, ID	Intermittent	4040 South 300 West , SALT LAKE CITY , ID 84107	83346	31424
Thermocal Mines of Idaho	Clark County, ID	Active	Hc 61 Box 1190 , Dubois , ID 83423	83423	5920
Three Rivers Stone Corp	Custer County, ID	Active	1036 South St , Orland , CA 95963	83226	113706
					269,023
B & H Stone Supply	Sanpete County, UT	Active	331 E 200 S , LINDON , UT 84042	84042	29297
B M W Stone Inc	Summit Co	Active	2565 S State Road 32 , WANSHIP , UT 84017	84017	18605
Bonneville Quarries	Box Elder County, UT	Intermittent	842 W 400 N , WEST BOUNTIFUL , UT 84087	84087	24673
Bonneville Quarries Inc	Box Elder County, UT	Intermittent	842 W 400 N , WEST BOUNTIFUL , UT 84087	84087	23233
Bown Building Stone	Sanpete County, UT	Intermittent	Manti , UT 84642	84642	8602
Feller Stone Inc	Washington County, UT	Intermittent	688 E Chad Ranch Rd , Veyo , UT 84782	84782	357
Gold Star Stone Inc	Box Elder County, UT	Intermittent	1648 So. 600 W. , Oakley , UT 83346	83346	3622
Gold Star Stone Inc	Box Elder County, UT	Intermittent	1648 So. 600 W. , Oakley , UT 83346	83346	3633
Heritage Quarries LLC	Box Elder County, UT	Intermittent	1111 N. 2000 W., #58 , Farr West , UT 84404	84404	13790
Mountain Valley Stone, Inc.	Summit County, UT	Active	2276 South Daniels Road , Heber , UT 84032	84032	60061
Northern Stone Supply Inc	Box Elder County, UT	Intermittent	Oakley, ID 83346	83346	5800
Northern Stone Supply Inc	Box Elder County, UT	Intermittent	Oakley, ID 83347	83346	4000
Penney's Gemstones	Box Elder County, UT	Intermittent	2400 East 30 South , BEAVER , UT 84713	84713	560
Rocanville Corporation	Millard County, UT	Intermittent	461 E. Topaz #8 , DELTA , UT 84624	84624	4561
Rocanville Stone	Millard County, UT	Intermittent	461 E. Topaz #8 , DELTA , UT 84624	84624	5080
Rock Products Of Utah Inc	Summit County, UT	Intermittent	MIDWAY , UT 84049	84049	19876
Sawtooth Stone LLC	Box Elder County, UT	Intermittent	2104 South 100 East , Oakley , UT 83346	83346	6160
Star Stone Quarries Inc	Summit County, UT	Intermittent	4040 South 300 West , SALT LAKE CITY , UT 84107	84107	25755
Star Stone Quarries Inc	Box Elder County, UT	Intermittent	4040 South 300 West , SALT LAKE CITY , UT 84107	84107	23940
					281,605
A & B Rock Distributers LLC	Clark	Active	37411 NE Vernon Rd Washougal, WA 98671	98671	17479
Dolphin Bay Quarry	San Juan	Active	Eastsound, WA 98245	98245	4649
Granite Products LLC	King	Intermittent	5819 Minder Rd Suite E, Poulsbo, WA 98370	98370	2243
Marenakos Inc	Thurston	Intermittent	Preston, WA 98050	98050	295
Montana Rock Products, Inc.	Pend Oreille	Active	2097 Tower Rd, Polson, MT 59860	99156	24348
Northwest Marble Products Inc	Stevens	Active	Chewelah, WA 99109	99109	2347
Penny Creek Quarry	Jefferson	Active	450 Penny Creek Rd Quilcene, WA 98376	98376	8477
Quality Rock Products Inc	Thurston	Active	16424 Old Hwy 99 SE Tenino WA 98589	98589	20166
White Stone Calcium Inc	Stevens	Intermittent	2432 Hwy 395 S., Chewelah, WA 99109	99109	15669
					95673

Appendix I - Hourly and employment data (Mine Safety and Health Admin., 2004)

Operator	Employees-2004	Quarters employed-2004	Employee Hours-2003	Employees-2003	Quarters employed-2003	Employee Hours-2002
Gerhard Borbonus Landscaping Inc	2	4	365	1	4	1000
Gillette Sharp Corporation,	No records	No records	No records	No records	No records	No records
Idaho Travertine Corp	2	4	0	0	4	1486
Northern Stone Supply Inc	16	4	16980	14	4	16980
Oakley Valley Stone Inc	15	4	21989	22	4	20306
Sawtooth Stone LLC	10	4	4660	14	4	0
Scrivanich Natural Stone Inc	58	4	56669	60	4	30480
Scrivanich Natural Stone Inc.	11	4	1193	6	4	0
Southwest Stone LLC	4	4	No records	No records	No records	No records
Star Stone Quarries Inc	16	4	17706	18	4	13664
Thermocal Mines of Idaho	3	4	5290	3	4	4541
Three Rivers Stone Corp	64	4	120626	58	4	70864
	224	48	246,199	198	44	159,861
B & H Stone Supply	10	4	23125	10	4	15203
B M W Stone Inc	11	4	17940	12	4	14833
Bonneville Quarries	16	4	17220	20	4	No record
Bonneville Quarries Inc	16	4	22980	20	4	20244
Bown Building Stone	8	4	5889	5	4	6176
Feller Stone Inc	2	4	280	2	4	290
Gold Star Stone Inc	12	2	1070	2	4	6863
Gold Star Stone Inc	11	3	1070	2	4	5033
Heritage Quarries LLC	12	4	0	0	0	0
Mountain Valley Stone, Inc.	32	4	37834	21	4	51882
Northern Stone Supply Inc	3	4	5800	3	4	5800
Northern Stone Supply Inc	2	4	4000	2	4	4000
Penney's Gemstones	2	4	800	3	4	0
Rocanville Corporation	5	4	384	2	3	2560
Rocanville Stone	5	4	4320	10	2	6940
Rock Products Of Utah Inc	14	4	10743	9	4	10061
Sawtooth Stone LLC	11	4	5280	11	3	No record
Star Stone Quarries Inc	18	4	14743	21	4	22891
Star Stone Quarries Inc	13	4	18310	38	4	11682
	203	73	191,788	193	68	184,458
A & B Rock Distributers LLC	12	4	16833	10	4	4231
Dolphin Bay Quarry	5	4	5062	10	4	4055
Granite Products LLC	2	4	No record	No record	No record	No record
Marenakos Inc	2	4	2346	3	4	0
Montana Rock Products, Inc.	15	4	18330	14	4	20355
Northwest Marble Products Inc	3	4	4283	3	4	4588
Penny Creek Quarry	4	4	9439	5	4	5924
Quality Rock Products Inc	12	4	22726	10	4	15556
White Stone Calcium Inc	11	4	9356	8	4	No record
	66	36	88375	63	32	54709

Appendix I - Hourly and employment data (Mine Safety and Health Admin., 2004)

Operator	Employees-2002	Quarters employeed 2002	Comments
Gerhard Borbonus Landscaping Inc	1	4	
Gillette Sharp Corporation,	No records	No records	
Idaho Travertine Corp	3	4	
Northern Stone Supply Inc	14	4	Quarry Mgr. says they have >50 empl in 2004
Oakley Valley Stone Inc	25	4	
Sawtooth Stone LLC	0	0	
Scrivanich Natural Stone Inc	30	4	
Scrivanich Natural Stone Inc.	0	2	
Southwest Stone LLC	No records	No records	
Star Stone Quarries Inc	11	4	
Thermocal Mines of Idaho	3	4	Includes Mill and Office at mine site
Three Rivers Stone Corp	59	4	
	148	38	
B & H Stone Supply	10	4	Employees: 7, quarry: 3, mill; 1, office
B M W Stone Inc	16	4	
Bonneville Quarries	No record	No record	two of these employees in office
Bonneville Quarries Inc	20	4	Employees: 2 office; remainder in quarry
Bown Building Stone	6	4	
Feller Stone Inc	1	4	
Gold Star Stone Inc	15	3	
Gold Star Stone Inc	12	2	
Heritage Quarries LLC	0	1	
Mountain Valley Stone, Inc.	27	4	
Northern Stone Supply Inc	3	4	
Northern Stone Supply Inc	2	4	
Penney's Gemstones	0	1	Includes 1 office employee
Rocanville Corporation	5	4	
Rocanville Stone	11	4	
Rock Products Of Utah Inc	9	4	Includes 1 office employee
Sawtooth Stone LLC	No record	No record	
Star Stone Quarries Inc	23	4	
Star Stone Quarries Inc	15	4	
	175	59	
A & B Rock Distributers LLC	6	2	
Dolphin Bay Quarry	10	4	
Granite Products LLC	No record	No record	
Marenakos Inc	0	4	
Montana Rock Products, Inc.	22	3	
Northwest Marble Products Inc	3	4	
Penny Creek Quarry	5	3	
Quality Rock Products Inc	7	3	
White Stone Calcium Inc	No record	No record	
	53	23	

Appendix 2 – Utah port-of-entry data for stone.

Source: Utah Department of Transportation

Headers:

Carrier name	Name of trucking company
Address	Address of trucking company
City	City of trucking company
State	State of trucking company
Zip	Zip code of trucking company
Cargo	Cargo
Location	Location of port of entry station
County	County of port of entry station
Date	Date passing station
To	TO destination point
From	FROM origination point
Veh type	Vehicle
Weight	Gross weight

Appendix 2 - Utah Port-of-Entry Data (Utah Department of Transportation)

Carrier Name	Address	City	State	Zip	Cargo	LOCATION	COUNTY	DATE	TO
CARRIERS WITH INSPECTIONS HAULING LANDSCAPING STONE PRODUCTS AS OF 12/2004 (sorted by county and city of destination)									DEST
E K BAILEY CONSTRUCTION	1243 N WASHINGTON	OGDEN	UT	84404	ROCK	PERRY POE	BOX ELDER	8/13/2004	BRIGHAM CITY
FRANCIS TRUCKING	2855 S 1200 W	BRIGHAM CITY	UT	84302	ROCK	PERRY POE	BOX ELDER	6/23/2004	BRIGHAM CITY
GALE ALLRED	5560 N HWY 69	BRIGHAM CITY	UT	84302	LANDSCAPE ROCK/LARGE	PERRY POE	BOX ELDER	4/8/2004	BRIGHAM CITY
STIDHAM TRUCKING	PO BOX 308	YREKA	CA	96097	ROCK	PERRY POE	BOX ELDER	10/13/2003	CHALIS, ID
TABLETOP INC	309 E 500 N	RICHFIELD	UT	84701	ROCK	PERRY POE	BOX ELDER	5/20/2004	CHALIS, ID
BRONCO TRANSPORTATION	19951 WILLIAMS RD	CALIENTE	CA	93518	ROCK	PERRY POE	BOX ELDER	5/28/2004	CLAYTON, ID
GALVAN VELEZ TRUCKING	541 CHAUSEE RD	GRANGER	WA	98932	ROCK	I 15 CORINNE RST AR	BOX ELDER	6/15/2004	HAYDEN, ID
B & K FOX CONTRACTORS INC	1075 N 2000 W	FARR WEST	UT	84404	ROCK	SR 89 SR126	BOX ELDER	6/22/2004	LOCAL
B & K FOX CONTRACTORS INC	1075 N 2000 W	FARR WEST	UT	84404	ROCK	SR 89 SR126	BOX ELDER	6/22/2004	LOCAL
BOB & SONS CONCRETE	5249 S 5500 W	HOOPER	UT	84315	ROCKS	PERRY POE	BOX ELDER	3/18/2004	LOCAL
C E BUTTERS REALTY AND CONST.	760 N HWY 89	HARRISVILLE	UT	84404	ROCK	SR 89 SR126	BOX ELDER	6/22/2004	LOCAL
D K S CUSTOM GRADING	1788 E 1780 N	LOGAN	UT	84341	DIRT & ROCK	PERRY POE	BOX ELDER	5/25/2004	LOCAL
RANDY MARRIOTT CONSTRUCTION	5238 W 2150 N	OGDEN	UT	84404	ROCK	SR 89 SR126	BOX ELDER	6/22/2004	LOCAL
RANDY MARRIOTT CONSTRUCTION	5238 W 2150 N	OGDEN	UT	84404	ROCK	SR 89 SR126	BOX ELDER	6/28/2004	LOCAL
K C CRANE AND EXCAVATING	6788 N HWY 91	LOGAN	UT	84323	ROCK	PERRY POE	BOX ELDER	7/14/2004	LOGAN
OLSEN BROS TRANSPORTATION	PO BOX 306	GARLAND	UT	84312	ROCK	PERRY POE	BOX ELDER	7/27/2004	LYNN, UT
AMERICAN STONE SALES INC	4040 S 300 W	SALT LAKE CITY	UT	84107	ROCK	PERRY POE	BOX ELDER	8/13/2004	OAKLEY, ID
ANDREW VAN LINES	PO BOX 1609	NORFOLK	NE	68702	ROCKS	PERRY POE	BOX ELDER	3/18/2004	OAKLEY, ID
GENSIS TRANSPORTATION	737 LYMAN AVE	COVINA	CA	91724	ROCK	PERRY POE	BOX ELDER	8/19/2004	OAKLEY, ID
GORDON KEEGAN ENTERPRISES	7249 E STATE RT 101	CLYDE	OH	43410	ROCK	PERRY POE	BOX ELDER	7/28/2004	OAKLEY, ID
HORTON TRUCKING INC	PO BOX 1561	TREMON	IL	61568	STONE	PERRY POE	BOX ELDER	5/11/2004	OAKLEY, ID
LA CADENA BUILDING MATERIALS	2690 S LA CADENA DR	COLTON	CA	93234	STONE	PERRY POE	BOX ELDER	7/26/2004	OAKLEY, ID
FRANCO BROTHERS TRUCKING	11154 8TH AVE	HESPERIA	CA	92345	FLATSTONE	PERRY POE	BOX ELDER	3/23/2004	OAKLEY, UT
FRANCO BROTHERS TRUCKING	11154 8TH AVE	HESPERIA	CA	92345	ROCK	PERRY POE	BOX ELDER	7/23/2004	OAKLEY, UT
MORGAN EXCAVATING	3452 S 500 W	SALT LAKE CITY	UT	84115	ROCK	PERRY POE	BOX ELDER	6/18/2004	OAKLEY,ID
PARADISE TURF LLC	245 E GAMMON	VINEYARD	UT	84058	STONE	PERRY POE	BOX ELDER	1/31/2004	OAKLEY,ID
PEAK TRANSPORT	PO BOX 747	LEHI	UT	84043	ROCK	PERRY POE	BOX ELDER	7/8/2004	OAKLEY,ID
JASPER TRUCKING INC	PO BOX 227	LACROSSE	WA	99143	STONE PAVERS	PERRY POE	BOX ELDER	11/5/2003	OAKLY, ID
BIRCH CREEK EXCAVATION	2755 VIEW RIDGE DR	NORTH LOGAN	UT	84341	ROCK	PERRY POE	BOX ELDER	7/14/2004	OGDEN
C E BUTTERS REALTY AND CONST.	760 N HWY 89	HARRISVILLE	UT	84404	ROCK	SR 89 SR126	BOX ELDER	6/22/2004	OGDEN
LANDECOR LLC	2150 N 1200 W	LEHI	UT	84042	ROCK	PERRY POE	BOX ELDER	1/29/2004	PARK VALLEY
BEAR MOUNTAIN MOTOR CARRIAGE	PO BOX 39430	DOWNEY	CO	90239	ROCK	PERRY POE	BOX ELDER	6/2/2004	PLAINS, MT
BLUE SKY TRANSPORT	PO BOX 1349	MILES CITY	MT	59301	ROCK	PERRY POE	BOX ELDER	8/14/2004	PLAINS, MT
BONNEVILLE QUARRIES	842 W 400 N	BOUNTIFUL	UT	84087	ROCK	TREMONTON, MAIN	BOX ELDER	5/10/2004	ROSETTE
D K S CUSTOM GRADING	1788 E 1780 N	LOGAN	UT	84341	ROCK	PERRY POE	BOX ELDER	4/3/2004	WILLARD
K C CRANE AND EXCAVATING	6788 N HWY 91	LOGAN	UT	84323	ROCK	PERRY POE	BOX ELDER	5/26/2004	WILLARD
SUPERIOR PAVING LC	770 W 200 N #12	LOGAN	UT	84319	LANDSCAPE ROCKS	PERRY POE	BOX ELDER	6/10/2004	WILLARD
PERKINS TRUCKING	816 N MAIN	SPRINGVILLE	UT	84663	ROCK	PEERLESS POE	CARBON	3/30/2004	RUPERT, ID
GO SOLARIS	1201 W 22ND ST	CHEYENNE	WY	82001	ROCKS	LOMA POE	COLORADO	12/17/2003	BOULDER, CO
B MEYER TRUCKING	314 S BROADWAY 102	ADA	OK	74821	ROCKS	LOMA POE	COLORADO	11/6/2003	BRONSON, KS
SINGLE SOURCE TRANSPORTATION CO	PO BOX 855	DES MOINES	IA	50304	STONE	LOMA POE	COLORADO	3/19/2004	DENVER, CO
CRST MALONE INC	PO BOX 101029	BIRMINGHAM	AL	35210	STONE	LOMA POE	COLORADO	8/11/2004	ESTELLINE, TX
K JOHNSON TRUCKING	PO BOX 1976	ALMA	AR	72921	ROCK	LOMA POE	COLORADO	4/14/2004	HENDERSON, CO

Appendix 2 - Utah Port-of-Entry Data (Utah Department of Transportation)

Carrier Name	Address	City	State	Zip	Cargo	FROM	VEH TYPE	WEIGHT
CARRIERS WITH INSPECTIONS HAULING LANDSCAPING STONE PRODUCTS AS OF 12/2004 (sorted by county and city of destination)						**INATION**		
E K BAILEY CONSTRUCTION	1243 N WASHINGTON	OGDEN	UT	84404	ROCK	OGDEN	DOUBLE	
FRANCIS TRUCKING	2855 S 1200 W	BRIGHAM CITY	UT	84302	ROCK	OGDEN	DOUBLE	
GALE ALLRED	5560 N HWY 69	BRIGHAM CITY	UT	84302	LANDSCAPE ROCK/LARGE	LOCAL	STR TRUCK	
STIDHAM TRUCKING	PO BOX 308	YREKA	CA	96097	ROCK	CHINO, CA	TRACT/TRL	
TABLETOP INC	309 E 500 N	RICHFIELD	UT	84701	ROCK	LAKE FOREST, CA	TRACT/TRL	
BRONCO TRANSPORTATION	19951 WILLIAMS RD	CALIENTE	CA	93518	ROCK	SAN MARCOS, CA	TRACT/TRL	
GALVAN VELEZ TRUCKING	541 CHAUSEE RD	GRANGER	WA	98932	ROCK	SALT LAKE	DOUBLE	
B & K FOX CONTRACTORS INC	1075 N 2000 W	FARR WEST	UT	84404	ROCK		STR TRUCK	
B & K FOX CONTRACTORS INC	1075 N 2000 W	FARR WEST	UT	84404	ROCK		STR TRUCK	
BOB & SONS CONCRETE	5249 S 5500 W	HOOPER	UT	84315	ROCKS		DOUBLE	
C E BUTTERS REALTY AND CONST.	760 N HWY 89	HARRISVILLE	UT	84404	ROCK		TRACT/TRL	
D K S CUSTOM GRADING	1788 E 1780 N	LOGAN	UT	84341	DIRT & ROCK		TRACT/ TRL	
RANDY MARRIOTT CONSTRUCTION	5238 W 2150 N	OGDEN	UT	84404	ROCK		STR TRUCK	
RANDY MARRIOTT CONSTRUCTION	5238 W 2150 N	OGDEN	UT	84404	ROCK		STR TRUCK	
K C CRANE AND EXCAVATING	6788 N HWY 91	LOGAN	UT	84323	ROCK	SALT LAKE	STR TRUCK	
OLSEN BROS TRANSPORTATION	PO BOX 306	GARLAND	UT	84312	ROCK	LUGUNA NAGEL, CA	TRACT/TRL	
AMERICAN STONE SALES INC	4040 S 300 W	SALT LAKE CITY	UT	84107	ROCK	SALT LAKE	TRACT/TRL	
ANDREW VAN LINES	PO BOX 1609	NORFOLK	NE	68702	ROCKS	LOS ANGELES, CA	TRACT/TRL	
GENSIS TRANSPORTATION	737 LYMAN AVE	COVINA	CA	91724	ROCK	THSD. PALMS, CA	TRACT/TRL	
GORDON KEEGAN ENTERPRISES	7249 E STATE RT 101	CLYDE	OH	43410	ROCK	BOYERTOWN, PA	TRACT/TRL	
HORTON TRUCKING INC	PO BOX 1561	TREMON	IL	61568	STONE	ORANGE, CA	TRACT/TRL	52000
LA CADENA BUILDING MATERIALS	2690 S LA CADENA DR	COLTON	CA	93234	STONE	COLTON, CA	TRACT/TRL	
FRANCO BROTHERS TRUCKING	11154 8TH AVE	HESPERIA	CA	92345	FLATSTONE	LAKESIDE,CA	TRACT/TRL	
FRANCO BROTHERS TRUCKING	11154 8TH AVE	HESPERIA	CA	92345	ROCK	WINCHESTER, CA	TRACT/TRL	
MORGAN EXCAVATING	3452 S 500 W	SALT LAKE CITY	UT	84115	ROCK	SALT LAKE	TRACT/TRL	52000
PARADISE TURF LLC	245 E GAMMON	VINEYARD	UT	84058	STONE	SALT LAKE	TRACT/TRL	
PEAK TRANSPORT	PO BOX 747	LEHI	UT	84043	ROCK	PLEASANT VIEW, UT	TRACT/TRL	
JASPER TRUCKING INC	PO BOX 227	LACROSSE	WA	99143	STONE PAVERS	SALT LAKE	DOUBLE	
BIRCH CREEK EXCAVATION	2755 VIEW RIDGE DR	NORTH LOGAN	UT	84341	ROCK	SMITHFIELD	STR TRUCK	
C E BUTTERS REALTY AND CONST.	760 N HWY 89	HARRISVILLE	UT	84404	ROCK	DRAPER, UT	TRACT/TRL	
LANDECOR LLC	2150 N 1200 W	LEHI	UT	84042	ROCK	LEHI	STR TRUCK	
BEAR MOUNTAIN MOTOR CARRIAGE	PO BOX 39430	DOWNEY	CO	90239	ROCK	SAN BERNARDINO, CA	TRACT/TRL	90300
BLUE SKY TRANSPORT	PO BOX 1349	MILES CITY	MT	59301	ROCK	WILMINGTON, CA	TRACT/TRL	
BONNEVILLE QUARRIES	842 W 400 N	BOUNTIFUL	UT	84087	ROCK	SNOWVILLE	STR TRUCK	
D K S CUSTOM GRADING	1788 E 1780 N	LOGAN	UT	84341	ROCK	LOGAN	TRK/TRL	
K C CRANE AND EXCAVATING	6788 N HWY 91	LOGAN	UT	84323	ROCK	CACHE VALLEY	STR TRUCK	
SUPERIOR PAVING LC	770 W 200 N #12	LOGAN	UT	84319	LANDSCAPE ROCKS	LOGAN	STR TRUCK	50000
PERKINS TRUCKING	816 N MAIN	SPRINGVILLE	UT	84663	ROCK	GRAND JUNCTION, CO	TRACT/TRL	
GO SOLARIS	1201 W 22ND ST	CHEYENNE	WY	82001	ROCKS	MOAB	TRACT/TRL	
B MEYER TRUCKING	314 S BROADWAY 102	ADA	OK	74821	ROCKS	WINDSOR, CA	TRACT/TRL	
SINGLE SOURCE TRANSPORTATION CO	PO BOX 855	DES MOINES	IA	50304	STONE	SALT LAKE	TRACT/TRL	
CRST MALONE INC	PO BOX 101029	BIRMINGHAM	AL	35210	STONE		TRACT/TRL	
K JOHNSON TRUCKING	PO BOX 1976	ALMA	AR	72921	ROCK	SALT LAKE	TRACT/TRL	

Appendix 2 - Utah Port-of-Entry Data (Utah Department of Transportation)

Carrier Name	Address	City	State	Zip	Cargo	LOCATION	COUNTY	DATE	TO
WEAVER & SONS EXCAVATING	2422 S MAIN	CLEARFIELD	UT	84015	LANDSCAPE ROCKS	139 S 300 E FARM	DAVIS	12/10/2003	NORTH OGDEN
WASATCH FOOTING AND FOUNDATION	5757 W BENCH DR	KEARNS	UT	84118	ROCKS	NORTH SALT LAKE	DAVIS	11/5/2003	WILLARD
RANDY MARRIOTT CONSTRUCTION	5238 W 2150 N	OGDEN	UT	84404	LANDSCAPING ROCKS	326 E SUMMERWOOD	DAVIS	11/14/2003	
SEM TEX EXPRESS	103 NE 2ND	SEMINOLE	TX	79360	LAVA ROCK	I 70 MP 99	EMERY	1/7/2004	FILLMORE, UT
FELLER STONE INC	688 E CHAD RANCH RD	VEYO	UT	84782	ROCK	PANGUITCH	GARFIELD	5/26/2004	LOCAL
LEGRAND JOHNSON CONSTRUCTION	PO BOX 248	LOGAN	UT	84323	ROCKS	SR191 MP 128	GRAND	10/20/2003	ARCHES
SUNROC	PO BOX 1955	OREM	UT	84059	ROCK	KITTY HAWK CEDAR	IRON	7/20/2004	CEDAR CITY
CEDAR MOUTAIN CONSTRUCTION	2240 W 2350 N	CEDAR CITY	UT	84720	ROCK	SR 14	IRON	4/28/2004	LOCAL
NEIL BRADSHAW	PO BOX 87	MILFORD	UT	84751	ROCK	SR 56 WB	IRON	8/17/2004	LOCAL
SCHMIDT CONSTRUCTION INC	PO BOX 3217	CEDAR CITY	UT	84721	ROCK	SR 56 NB	IRON	8/17/2004	LOCAL
BRUCE H HANSEN	PO BOX 341	KANAB	UT	84741	ROCK	KANAB POE	KANE	8/18/2004	LOCAL
DIAMOND D LANDSCAPING INC	648 E COLLAGE AVE	CEDAR CITY	UT	84720	ROCK	KANAB POE	KANE	5/24/2004	LOCAL
ELLOT BROTHERS TRUCKING	1028 S 770 E	ST GEORGE	UT	84790	ROCK	SR 14 STRAWBERRY	KANE	8/18/2004	STRAWBERRY, UT
WERNER ENTERPRISES	PO BOX 45308	OMAHA	NE	68145	STONE	KANAB POE	KANE	5/11/2004	WILCOX, AZ
T C L S INC	1309 W 3300 N	PLEASANT GROVE	UT	84062	ROCK	SR 68 BLUFFDALE	SALT LAKE	7/26/2004	BLUFFDALE
J K L CONSTRUCTION	1500 S HWY 118	RICHFIELD	UT	84701	ROCK	BANGERTER I 15	SALT LAKE	12/4/2003	DRAPER
ROBERT A JOHNSON EXCAVATING	PO BOX 301	MAGNA	UT	84044	ROCK	I 80 BEACHES EXIT	SALT LAKE	4/7/2004	GRANTSVILLE
COTTONWOOD BUILDERS	3804 S HIGHLAND	SALT LAKE CITY	UT	84106	ROCKS	3180 S 5600 W	SALT LAKE	8/18/2004	LOCAL
LTI INC	PO BOX 18789	SALT LAKE CITY	UT	84118	ROCK	6300 W 5400 S	SALT LAKE	5/5/2004	LOCAL
LTI INC	PO BOX 18789	SALT LAKE CITY	UT	84118	ROCK	3200 S 5600 W	SALT LAKE	7/21/2004	LOCAL
T S G	1927 ASHLEY MESA LN	SANDY	UT	84092	ROCK	U-111 4100 S	SALT LAKE	7/8/2004	LOCAL
TUFF SHED INC	5501 S COMMERCE DR	MURRAY	UT	84107	DIRT/ROCK	850 E 4500 S	SALT LAKE	7/13/2004	LOCAL
FRANCO BROTHERS TRUCKING	11154 8TH AVE	HESPERIA	CA	92345	FLATSTONE	12500 S I 15	SALT LAKE	5/19/2004	PEOA, UT
FOTI ENTERPRISES GENERAL CONTR	751 S 500 W #B	BOUNTIFUL	UT	84010	ROCK	700 S DELONG	SALT LAKE	7/19/2004	SALT LAKE
NEWMAN CONSTRUCTION	13331 S REDWOOD	RIVERTON	UT	84065	LARGE BOULDERS	13400 S 1500 W	SALT LAKE	10/2/2003	SALT LAKE
3 H LANDSCAPE PRODUCTS	2160 E RIVERSIDE DR	ST GEORGE	UT	84770	ROCKS	5600 S 320 W	SALT LAKE	7/13/2004	ST GEORGE
L K L ASSOCIATES INC	3437 W NORRIS VIEW	WEST JORDAN	UT	84088	STONE	6000 S NORTHBOUND	SALT LAKE	5/26/2004	WEST JORDAN
L K L ASSOCIATES INC	3437 W NORRIS VIEW	WEST JORDAN	UT	84088	STONE AND BAGS OF MIX	5720 S 5699 W	SALT LAKE	7/8/2004	WEST JORDAN
COSBY TRUCKING	601 S 200 E 95-3	BLANDING	UT	84511	ROCKS	SR 191 MP48	SAN JUAN	11/25/2003	BLUFF
KSUE CORP	PO BOX 1032	MOAB	UT	84532	ROCK	LISBON VALLEY	SAN JUAN	7/6/2004	LISBON VALLEY
SUTHERLAND BROTHERS INC	PO BOX 889	NUCLA	CO	81424	ROCK	LA SAL, UT	SAN JUAN	7/6/2004	NUCLA, CO
LARRY HAMACHER TRANSPORT	1915 N TOWNSEND AVE	MONTROSE	CO	81401	STONE	MONTICELLO POE	SAN JUAN	5/12/2004	PHOENIX, AZ
RODNEY RASSMUSSEN	155 E 200 S	SALINA	UT	84654	DIRT/ROCKS	I 70 AURORA INTERCH	SEVIER	12/16/2003	RICHFIELD
BASTIAN TRUCKING	PO BOX 417	AURORA	UT	84620	ROCKS	SR 50	SEVIER	11/18/2003	
AERIE TRUCKING	4525 WASATCH BLVD	SALT LAKE CITY	UT	84124	ROCKS	QUINNS JUNCTION	SUMMIT	12/4/2003	BROWNS CNYN
ROADRUNNER EXPEDITERS INC	PO BOX 1325	DES MOINES	IA	60017	STONE	ECHO POE	SUMMIT	5/20/2004	CHICAGO, IL
ANDERSON COMPANY	25 FAIRWAY PL	SELMER	TN	38375	STONE	ECHO POE	SUMMIT	3/22/2004	FORT SCOTT,KS
R J ENTERPRISES INC	PO BOX 296	HEBER	UT	84032	STONE	QUINNS JUNCTION	SUMMIT	5/5/2004	HEBER
MITKO TRANSPORT BG	PO BOX 2063	SCHILLER PARK	IL	60176	STONE	ECHO POE	SUMMIT	7/4/2004	LIBERTY,MO
TRIPLE D SUPPLY LIMITED LIABILITY CO	350 CRAWFORD BLVD	LAS CRUCES	NM	88007	STONE	ECHO POE	SUMMIT	6/15/2004	MESHOPPEN, PA
SWIFT TRANSPORTATION	PO BOX 29243	PHOENIX	AZ	85038	STONE	ECHO POE	SUMMIT	2/22/2004	RAVENNA, OH
JVW TRUCKING	5121 N JONES RD	DELTA	UT	84624	ROCK	ECHO POE	SUMMIT	6/10/2004	SANTA ROSA, CA
PRIME INC	PO BOX 4208	SPRINGFIELD	MO	65808	LEVELING ROCK	ECHO POE	SUMMIT	3/20/2004	SOUTHARD,OK
HUGOE TRUCKING	PO BOX 870199	WEST BOUNTIFUL	UT	84087	ROCK	SR 36 FAUST	TOOELE	7/14/2004	LEHI
CLARK COUNTY CARRIERS LLC	RR3 BOX 206	CLARK	SD	57225	STONE	WENDOVER POE	TOOELE	6/9/2004	NAPA, CA
TONKA EXCAVATING LLC	PO BOX 1244	VERNAL	UT	84078	ROCK	SR 40	UINTAH	3/30/2004	VERNAL

Appendix 2 - Utah Port-of-Entry Data (Utah Department of Transportation)

Carrier Name	Address	City	State	Zip	Cargo	FROM	VEH TYPE	WEIGHT
WEAVER & SONS EXCAVATING	2422 S MAIN	CLEARFIELD	UT	84015	LANDSCAPE ROCKS	FARMINGTON	STR TRUCK	52000
WASATCH FOOTING AND FOUNDATION	5757 W BENCH DR	KEARNS	UT	84118	ROCKS	NORTH SALT LAKE	STR TRUCK	80000
RANDY MARRIOTT CONSTRUCTION	5238 W 2150 N	OGDEN	UT	84404	LANDSCAPING ROCKS		STR TRUCK	80000
SEM TEX EXPRESS	103 NE 2ND	SEMINOLE	TX	79360	LAVA ROCK	NEOSHO, MO	TRACT/TRL	80000
FELLER STONE INC	688 E CHAD RANCH RD	VEYO	UT	84782	ROCK		TRACT/TRL	
LEGRAND JOHNSON CONSTRUCTION	PO BOX 248	LOGAN	UT	84323	ROCKS	GRAND CNTY LNDFLL	STR TRUCK	80000
SUNROC	PO BOX 1955	OREM	UT	84059	ROCK	ST GEORGE	TRK/TRL	
CEDAR MOUTAIN CONSTRUCTION	2240 W 2350 N	CEDAR CITY	UT	84720	ROCK		TRK/TRL	16300
NEIL BRADSHAW	PO BOX 87	MILFORD	UT	84751	ROCK		STR TRUCK	29700
SCHMIDT CONSTRUCTION INC	PO BOX 3217	CEDAR CITY	UT	84721	ROCK		STR TRUCK	50000
BRUCE H HANSEN	PO BOX 341	KANAB	UT	84741	ROCK		TRACT/TRL	
DIAMOND D LANDSCAPING INC	648 E COLLAGE AVE	CEDAR CITY	UT	84720	ROCK		STR TRUCK	
ELLOT BROTHERS TRUCKING	1028 S 770 E	ST GEORGE	UT	84790	ROCK	MAMMOTH CREEK	DOUBLE	188000
WERNER ENTERPRISES	PO BOX 45308	OMAHA	NE	68145	STONE	BRYCE CANYN	TRACT/TRL	
T C L S INC	1309 W 3300 N	PLEASANT GROVE	UT	84062	ROCK	SALEM	STR TRUCK	
J K L CONSTRUCTION	1500 S HWY 118	RICHFIELD	UT	84701	ROCK	DRAPER, UT	DOUBLE	129000
ROBERT A JOHNSON EXCAVATING	PO BOX 301	MAGNA	UT	84044	ROCK	SALT LAKE	STR TRUCK	
COTTONWOOD BUILDERS	3804 S HIGHLAND	SALT LAKE CITY	UT	84106	ROCKS		TRACT/TRL	
LTI INC	PO BOX 18789	SALT LAKE CITY	UT	84118	ROCK		DOUBLE	
LTI INC	PO BOX 18789	SALT LAKE CITY	UT	84118	ROCK		DOUBLE	
T S G	1927 ASHLEY MESA LN	SANDY	UT	84092	ROCK		STR TRUCK	
TUFF SHED INC	5501 S COMMERCE DR	MURRAY	UT	84107	DIRT/ROCK		STR TRUCK	
FRANCO BROTHERS TRUCKING	11154 8TH AVE	HESPERIA	CA	92345	FLATSTONE	THSD. OAKS, CA	TRACT/TRL	
FOTI ENTERPRISES GENERAL CONTR	751 S 500 W #B	BOUNTIFUL	UT	84010	ROCK	SALT LAKE	STR TRUCK	
NEWMAN CONSTRUCTION	13331 S REDWOOD	RIVERTON	UT	84065	LARGE BOULDERS	SALT LAKE	TRACT/TRL	
3 H LANDSCAPE PRODUCTS	2160 E RIVERSIDE DR	ST GEORGE	UT	84770	ROCKS	OGDEN	DOUBLE	
L K L ASSOCIATES INC	3437 W NORRIS VIEW	WEST JORDAN	UT	84088	STONE	LOGAN	TRK/TRL	38000
L K L ASSOCIATES INC	3437 W NORRIS VIEW	WEST JORDAN	UT	84088	STONE AND BAGS OF MIX	KEARNS	TRACT/TRL	
COSBY TRUCKING	601 S 200 E 95-3	BLANDING	UT	84511	ROCKS	BLANDING	TRACT/TRL	80000
KSUE CORP	PO BOX 1032	MOAB	UT	84532	ROCK		STR TRUCK	
SUTHERLAND BROTHERS INC	PO BOX 889	NUCLA	CO	81424	ROCK	NUCLA, CO	TRACT/TRL	
LARRY HAMACHER TRANSPORT	1915 N TOWNSEND AVE	MONTROSE	CO	81401	STONE	HENDERSON, CO	TRACT/TRL	
RODNEY RASSMUSSEN	155 E 200 S	SALINA	UT	84654	DIRT/ROCKS	SALINA	TRACT/TRL	80000
BASTIAN TRUCKING	PO BOX 417	AURORA	UT	84620	ROCKS		TRACT/TRL	80000
AERIE TRUCKING	4525 WASATCH BLVD	SALT LAKE CITY	UT	84124	ROCKS	PROVO	STR TRUCK	54200
ROADRUNNER EXPEDITERS INC	PO BOX 1325	DES MOINES	IA	60017	STONE	GUSTINE, CA	TRACT/TRL	
ANDERSON COMPANY	25 FAIRWAY PL	SELMER	TN	38375	STONE	KETCHUM, ID	TRACT/TRL	80000
R J ENTERPRISES INC	PO BOX 296	HEBER	UT	84032	STONE	PARK CITY	TRK/TRL	80000
MITKO TRANSPORT BG	PO BOX 2063	SCHILLER PARK	IL	60176	STONE	OAKLAND,CA	TRACT/TRL	
TRIPLE D SUPPLY LIMITED LIABILITY CO	350 CRAWFORD BLVD	LAS CRUCES	NM	88007	STONE	DRAPER, UT	TRACT/TRL	
SWIFT TRANSPORTATION	PO BOX 29243	PHOENIX	AZ	85038	STONE	RENO, NV	TRACT/TRL	
JVW TRUCKING	5121 N JONES RD	DELTA	UT	84624	ROCK	SALT LAKE	TRACT/TRL	
PRIME INC	PO BOX 4208	SPRINGFIELD	MO	65808	LEVELING ROCK	SACRAMENT,CA	TRACT/TRL	
HUGOE TRUCKING	PO BOX 870199	WEST BOUNTIFUL	UT	84087	ROCK	EUREKA	STR TRUCK	
CLARK COUNTY CARRIERS LLC	RR3 BOX 206	CLARK	SD	57225	STONE	ENGLEWOOD, CO	TRACT/TRL	
TONKA EXCAVATING LLC	PO BOX 1244	VERNAL	UT	84078	ROCK	VERNAL	STR TRUCK	

Appendix 2 - Utah Port-of-Entry Data (Utah Department of Transportation)

Carrier Name	Address	City	State	Zip	Cargo	LOCATION	COUNTY	DATE	TO
M K CONSTRUCTION	750 W 450 S	OREM	UT	84058	ROCK	I 15 BENJAMIN	UTAH	8/17/2004	BAKER, NV
J C PATERSON TRUCKING	3075 W 8450 S	WEST JORDAN	UT	84088	ROCK	SARATOGA	UTAH	3/2/2004	EAGLE MTN
DICKS BACKHOE AND SEWER CONNE	10433 CROCUSS ST	SANDY	UT	84093	ROCK	SR 73 LEHI	UTAH	12/2/2003	LEHI
KENNY SENG CONSTRUCTION	PO BOX 26453	SALT LAKE CITY	UT	84126	ROCK	OLSEN'S NURSERY	UTAH	5/3/2004	LOCAL
STEPHEN B MONSEN	1097 N MAIN ST	MAPLETON	UT	84664	LG STONE MASONRY	SR 6 SPN FK CNYN	UTAH	10/3/2003	LOCAL
GOMEZ EQUIPMENT INC.	1195 SOUTH 1600 WEST	MAPLETON	UT	84664	STONE	SR 189 MP 14	UTAH	4/15/2004	MAPLETON
J L DAHL & CO	315 W 100 S	SPRINGVILLE	UT	84663	LARGE SANDSTONE ROCK	I 15	UTAH	4/16/2004	MAPLETON
JOHN A MCKAY DBA MCKAY LEASING	1255 S HWY 117 #27	MT PLEASANT	UT	84647	ROCK	1800 W 400 S SPNVL	UTAH	7/7/2004	MT PLEASANT
NEPHI SAND AND STONE	PO BOX 137	NEPHI	UT	84648	ROCK	BENJAMIN	UTAH	5/27/2004	NEPHI
PRIME LANDSCAPE & DESIGN INC	356 W 840 W	OREM	UT	84058	LANDSCAPE ROCKS	UNIVERSITY AVE	UTAH	3/19/2004	NEPHI
PRIME LANDSCAPE & DESIGN INC	356 W 840 W	OREM	UT	84058	ROCK	700 S PAYSON	UTAH	10/8/2003	NEPHI
THE FIREPLACE	1678 N STATE ST	OREM	UT	84057	DECORATIVE ROCK	I 15 SR 77	UTAH	5/7/2004	OREM
AMERICAN STONE SALES INC	4040 S 300 W	SALT LAKE CITY	UT	84107	STONE	SPRINGVILLE	UTAH	7/29/2004	PARK CITY
FELLER STONE INC	688 E CHAD RANCH RD	VEYO	UT	84782	ROCK	PLEASANT GROVE	UTAH	5/24/2004	PLEASANT GROVE
GREEN SEASON LANDSCAPE	4962 S 1150 W	SPANISH FORK	UT	84660	LARGE ROCKS	900 N SPANISH FK	UTAH	7/26/2004	PROVO
T C L S INC	1309 W 3300 N	PLEASANT GROVE	UT	84062	LARGE ROCKS	200 S GENEVA RD	UTAH	5/4/2004	SALT LAKE
JEFF MICKELSEN DIESEL INC	PO BOX 402	AMERICAN FORK	UT	84003	ROCK	SR 6	UTAH	5/3/2004	SANTAQUIN
RICK MAULDIN	1875 W 600 S	PROVO	UT	84601	ROCKS	SR 73 / SR 68	UTAH	5/18/2004	SARATOGA
EVANS GRADER & PAVING INC	2068 S MTN VISTA LN	PROVO	UT	84606	ROCKS	I 15 UNIV PKWAY	UTAH	7/16/2004	SPRINGVILLE
ROCK IT STONE WORKS	PO BOX 386	DUCHESNE	UT	84021	ROCK	DANIELS POE	WASATCH	10/24/2003	DUCHESNE
ROCK IT STONE WORKS	PO BOX 386	DUCHESNE	UT	84021	ROCKS	DANIELS POE	WASATCH	3/12/2004	DUCHESNE
M L M LANDSCAPE AND DESIGN	PO BOX 981568	PARK CITY	UT	84098	LANDSCAPE MATERIALS	DANIELS POE	WASATCH	11/5/2003	HEBER
D C TRANSPORT AND EXCAVATING	3650 W HWY 248	KAMAS	UT	84036	ROCKS	DANIELS POE	WASATCH	11/3/2003	OAKLEY
UTAH STONE COMPANY	PO BOX 2156	OREM	UT	84059	STONE, FORKLIFT	DANIELS POE	WASATCH	4/14/2004	OREM
RUSTIC STONE MASONRY	PO BOX 133	MIDWAY	UT	84049	LARGE ROCKS	DANIELS POE	WASATCH	5/20/2004	PEOA, UT
RUSTIC STONE MASONRY	PO BOX 133	MIDWAY	UT	84049	ROCK	100 W BURGI MIDWAY	WASATCH	5/20/2004	PEOA, UT
CUBCO/ J5 TRANSPORTATION	PO BOX 296	PROVO	UT	84603	MISC STONE PRODUCTS	DANIELS POE	WASATCH	3/5/2004	PROVO
BRANDON C ESKELSON	4932 W MRNG LRL LN	WEST JORDAN	UT	84088	ROCK	1350 DANIEL RD HEBR	WASATCH	12/4/2003	SALT LAKE
SOMMERS MASONRY	7722 SABAL AVE	SALT LAKE CITY	UT	84121	LARGE ROCK	DANIELS POE	WASATCH	5/26/2004	SALT LAKE
CASCO GROUP INC	17719 VALLEY VIEW	CERRITOS	CA	90703	ROCKS	ST GEORGE POE	WASHINGTON	4/11/2004	FILLMORE, UT
SONS OF YOUNG TRANSPORTATION	1123 W US HWY 26	BLACKFOOT	ID	83221	ROCKS	ST GEORGE POE	WASHINGTON	4/29/2004	FONTANA, CA
HURRICANE READY MIX	720 S STATE	HURRICANE	UT	84737	ROCK	100 E 260 N LAVERKIN	WASHINGTON	7/7/2004	HURRICANE
US VALLEY TRANSPORT	PO BOX 4209	CARSON CITY	NV	89702	STONE	ST GEORGE POE	WASHINGTON	8/4/2004	HURRICANE
ENGINEERS TRANSPORT	PO BOX 58	PROVO	UT	84603	STONE	ST GEORGE POE	WASHINGTON	6/22/2004	LAS VEGAS, NV
AMERICAN MOBILE CONCRETE	690 N INDUSTRIAL RD 5	ST GEORGE	UT	84771	ROCK	ST GEORGE POE	WASHINGTON	1/21/2004	LITTLEFIELD, AZ
GUNLOCK ROCK	PO BOX 4	GUNLOCK	UT	84733	ROCK	SOUTH RIVER RD	WASHINGTON	4/28/2004	LOCAL
QUALITY EXCAVATING	113 E 200 N STE 2	ST GEORGE	UT	84770	ROCK	ST GEORGE CITY	WASHINGTON	12/9/2003	LOCAL
ROGERS CONSTRUCTION	PO BOX 10	ST GEORGE	UT	84771	ROCK	SOUTH RIVER RD	WASHINGTON	7/14/2004	LOCAL
RUESCH MACHINE	916 RED ROCK RD	ST GEORGE	UT	84770	ROCKS	SUGAR LEO RD	WASHINGTON	10/14/2003	LOCAL
STRATTON CONSTRUCTION	365 W CENTER	LAVERKIN	UT	84745	DIRT,ROCKS	800 S STATE	WASHINGTON	4/12/2004	LOCAL
STRATTON CONSTRUCTION	365 W CENTER	LAVERKIN	UT	84745	ROCK	ST GEORGE BLVD	WASHINGTON	1/27/2004	LOCAL
NOVCO INC	11090 173RD AVE NW	ELK RIVER	MN	55330	ROCKS	ST GEORGE POE	WASHINGTON	10/1/2003	OCEANSIDE, CA
FELLER STONE INC	688 E CHAD RANCH RD	VEYO	UT	84782	ROCK	SNOW CANYON PARK	WASHINGTON	6/25/2004	ST GEORGE
KANECO PRODUCTS INC	256 S 400 E	KANAB	UT	84741	ROCK	HURRICANE HILL	WASHINGTON	11/20/2003	ST GEORGE
WASATCH MOUNTAIN EXCAVATING INC	1307 W 1300 S	WOODS CROSSS	UT	84087	BOULDERS	400 N I-15	WEBER	7/22/2004	BOUNTIFUL
MARK B SEEGMILLER CONSTRUCTION	256 S 1525 W	FARMINGTON	UT	84025	BOULDERS	2700 N I 15	WEBER	6/17/2004	CENTERVILLE

Appendix 2 - Utah Port-of-Entry Data (Utah Department of Transportation)

Carrier Name	Address	City	State	Zip	Cargo	FROM	VEH TYPE	WEIGHT
M K CONSTRUCTION	750 W 450 S	OREM	UT	84058	ROCK	OREM	TRK/TRL	
J C PATERSON TRUCKING	3075 W 8450 S	WEST JORDAN	UT	84088	ROCK	SARATOGA	STR TRUCK	
DICKS BACKHOE AND SEWER CONNE	10433 CROCUSS ST	SANDY	UT	84093	ROCK	BOUNTIFUL	STR TRUCK	
KENNY SENG CONSTRUCTION	PO BOX 26453	SALT LAKE CITY	UT	84126	ROCK		STR TRUCK	
STEPHEN B MONSEN	1097 N MAIN ST	MAPLETON	UT	84664	LG STONE MASONRY		TRK/TRL	
GOMEZ EQUIPMENT INC.	1195 SOUTH 1600 WEST	MAPLETON	UT	84664	STONE	SUNDANCE	STR TRUCK	11000
J L DAHL & CO	315 W 100 S	SPRINGVILLE	UT	84663	LARGE SANDSTONE ROCK	WOODLAND	STR TRUCK	52000
JOHN A MCKAY DBA MCKAY LEASING	1255 S HWY 117 #27	MT PLEASANT	UT	84647	ROCK	SPRINGVILLE	STR TRUCK	26000
NEPHI SAND AND STONE	PO BOX 137	NEPHI	UT	84648	ROCK	PROVO	STR TRUCK	
PRIME LANDSCAPE & DESIGN INC	356 W 840 W	OREM	UT	84058	LANDSCAPE ROCKS	ALPINE	STR TRUCK	12000
PRIME LANDSCAPE & DESIGN INC	356 W 840 W	OREM	UT	84058	ROCK	PAYSON	STR TRUCK	
THE FIREPLACE	1678 N STATE ST	OREM	UT	84057	DECORATIVE ROCK	SPRINGVILLE	TRACT/TRL	36000
AMERICAN STONE SALES INC	4040 S 300 W	SALT LAKE CITY	UT	84107	STONE	ELK RIDGE	STR TRUCK	64000
FELLER STONE INC	688 E CHAD RANCH RD	VEYO	UT	84782	ROCK	WEST HAVEN	TRACT/TRL	
GREEN SEASON LANDSCAPE	4962 S 1150 W	SPANISH FORK	UT	84660	LARGE ROCKS	HANSEN, ID	TRK/TRL	24500
T C L S INC	1309 W 3300 N	PLEASANT GROVE	UT	84062	LARGE ROCKS	LINDON	STR TRUCK	54000
JEFF MICKELSEN DIESEL INC	PO BOX 402	AMERICAN FORK	UT	84003	ROCK	ELBERTA	TRACT/TRL	
RICK MAULDIN	1875 W 600 S	PROVO	UT	84601	ROCKS	SANDY	STR TRUCK	50000
EVANS GRADER & PAVING INC	2068 S MTN VISTA LN	PROVO	UT	84606	ROCKS	HIGHLAND	STR TRUCK	80000
ROCK IT STONE WORKS	PO BOX 386	DUCHESNE	UT	84021	ROCK	HEBER	TRACT/TRL	
ROCK IT STONE WORKS	PO BOX 386	DUCHESNE	UT	84021	ROCKS	HEBER	TRACT/TRL	
M L M LANDSCAPE AND DESIGN	PO BOX 981568	PARK CITY	UT	84098	LANDSCAPE MATERIALS	VERNAL	TRACT/TRL	
D C TRANSPORT AND EXCAVATING	3650 W HWY 248	KAMAS	UT	84036	ROCKS	DUCHESNE	TRACT/TRL	
UTAH STONE COMPANY	PO BOX 2156	OREM	UT	84059	STONE, FORKLIFT	VERNAL	TRK/TRL	25500
RUSTIC STONE MASONRY	PO BOX 133	MIDWAY	UT	84049	LARGE ROCKS	MIDWAY	STR TRUCK	
RUSTIC STONE MASONRY	PO BOX 133	MIDWAY	UT	84049	ROCK	MIDWAY	STR TRUCK	
CUBCO/ J5 TRANSPORTATION	PO BOX 296	PROVO	UT	84603	MISC STONE PRODUCTS	ROOSEVELT	TRK/TRL	
BRANDON C ESKELSON	4932 W MRNG LRL LN	WEST JORDAN	UT	84088	ROCK	DANIEL,UT	STR TRUCK	
SOMMERS MASONRY	7722 SABAL AVE	SALT LAKE CITY	UT	84121	LARGE ROCK	ROOSEVELT	TRK/TRL	37500
CASCO GROUP INC	17719 VALLEY VIEW	CERRITOS	CA	90703	ROCKS	CERRITOS, CA	STR TRUCK	25950
SONS OF YOUNG TRANSPORTATION	1123 W US HWY 26	BLACKFOOT	ID	83221	ROCKS	CHALLIS, ID	TRACT/TRL	
HURRICANE READY MIX	720 S STATE	HURRICANE	UT	84737	ROCK	SR 9	DOUBLE	160000
US VALLEY TRANSPORT	PO BOX 4209	CARSON CITY	NV	89702	STONE	SANTA ROSA, CA	TRACT/TRL	
ENGINEERS TRANSPORT	PO BOX 58	PROVO	UT	84603	STONE	CEDAR CITY	TRACT/TRL	
AMERICAN MOBILE CONCRETE	690 N INDUSTRIAL RD 5	ST GEORGE	UT	84771	ROCK	WASHINGTON	TRACT/TRL	
GUNLOCK ROCK	PO BOX 4	GUNLOCK	UT	84733	ROCK		STR TRUCK	
QUALITY EXCAVATING	113 E 200 N STE 2	ST GEORGE	UT	84770	ROCK		TRACT/TRL	
ROGERS CONSTRUCTION	PO BOX 10	ST GEORGE	UT	84771	ROCK		STR TRUCK	
RUESCH MACHINE	916 RED ROCK RD	ST GEORGE	UT	84770	ROCKS		TRACT/TRL	80000
STRATTON CONSTRUCTION	365 W CENTER	LAVERKIN	UT	84745	DIRT,ROCKS		TRACT/TRL	80000
STRATTON CONSTRUCTION	365 W CENTER	LAVERKIN	UT	84745	ROCK		TRACT/TRL	
NOVCO INC	11090 173RD AVE NW	ELK RIVER	MN	55330	ROCKS	ST PAUL, MN	TRACT/TRL	
FELLER STONE INC	688 E CHAD RANCH RD	VEYO	UT	84782	ROCK	ST GEORGE	TRACT/TRL	119000
KANECO PRODUCTS INC	256 S 400 E	KANAB	UT	84741	ROCK	KANAB	DOUBLE	
WASATCH MOUNTAIN EXCAVATING INC	1307 W 1300 S	WOODS CROSSS	UT	84087	BOULDERS	OGDEN	TRACT/TRL	80000
MARK B SEEGMILLER CONSTRUCTION	256 S 1525 W	FARMINGTON	UT	84025	BOULDERS	OGDEN	STR TRUCK	54000

Appendix 2 - Utah Port-of-Entry Data (Utah Department of Transportation)

Carrier Name	Address	City	State	Zip	Cargo	LOCATION	COUNTY	DATE	TO
CHAPMAN ROCK SCAPES	1832 N OLSEN WAY	BOUNTIFUL	UT	84087	ROCKS	SR 26 1500 W	WEBER	12/23/2003	LOCAL
E K BAILEY CONSTRUCTION	1243 N WASHINGTON	OGDEN	UT	84404	ROCK	I 15 SR 39	WEBER	8/12/2004	LOCAL
KASTLE ROCK EXCAVATING	8085 S JUNIPER CT	SOUTH WEBER	UT	84405	DIRT & ROCK	12TH ST 1100 W	WEBER	12/22/2003	LOCAL
STODDARD EXCAVATING	1683 W ANGEL WAY	KAYSVILLE	UT	84037	ROCK	SR 89 SR126	WEBER	7/6/2004	LOCAL
WASATCH VALLEY EXCAVATION & UTIL	PO BOX 1049	EDEN	UT	84310	ROCK	SR 89 SR 134	WEBER	6/28/2004	LOCAL
WASATCH VALLEY EXCAVATION & UTIL	PO BOX 1049	EDEN	UT	84310	ROCK	SR 89 SR 134	WEBER	6/28/2004	LOCAL
C E BUTTERS REALTY AND CONST.	760 N HWY 89	HARRISVILLE	UT	84404	LANDSCAPE ROCKS	1300 S 1900 W	WEBER	9/22/2004	OGDEN
COTA EXCAVATING INC	196 W MEADOW VIEW	OGDEN	UT	84404	DIRT AND ROCK	4473 N COTTONWOOD	WEBER	7/28/2004	OGDEN
GEC CONSTRUCTION INC	1150 W 24TH ST	OGDEN	UT	84401	LANDSCAPE ROCKS	700 N 2000 W	WEBER	9/10/2004	OGDEN
VINCENT TRANSPORTATION	PO BOX 2375	ELK GROVE	CA	95759	ROCK	SR 158 MP1	WEBER	6/16/2004	OGDEN
C E BUTTERS REALTY AND CONST.	760 N HWY 89	HARRISVILLE	UT	84404	LANDSCAPE ROCKS	2800 S 1900 W	WEBER	7/1/2004	WILLARD
H O S EXCAVATING INC	4995 S 7500 W	WEBER	UT	84315	LANDSCAPE ROCKS	2400 S 1900 W	WEBER	8/12/2004	WILLARD
SAMCO	855 VALERIA DR	LAYTON	UT	84041	LANDSCAPE ROCKS	1201 S 2100 S	WEBER	7/15/2004	WILLARD
WEATHER WORKS	2400 E 6600 S #A	UINTAH	UT	84405	ROCKS	SR 89 SO WEBER DR	WEBER	7/19/2004	

Appendix 2 - Utah Port-of-Entry Data (Utah Department of Transportation)

Carrier Name	Address	City	State	Zip	Cargo	FROM	VEH TYPE	WEIGHT
CHAPMAN ROCK SCAPES	1832 N OLSEN WAY	BOUNTIFUL	UT	84087	ROCKS		STR TRUCK	
E K BAILEY CONSTRUCTION	1243 N WASHINGTON	OGDEN	UT	84404	ROCK		DOUBLE	
KASTLE ROCK EXCAVATING	8085 S JUNIPER CT	SOUTH WEBER	UT	84405	DIRT & ROCK		STR TRUCK	54000
STODDARD EXCAVATING	1683 W ANGEL WAY	KAYSVILLE	UT	84037	ROCK		STR TRUCK	
WASATCH VALLEY EXCAVATION & UTIL	PO BOX 1049	EDEN	UT	84310	ROCK		TRACT/TRL	
WASATCH VALLEY EXCAVATION & UTIL	PO BOX 1049	EDEN	UT	84310	ROCK		TRACT/TRL	
C E BUTTERS REALTY AND CONST.	760 N HWY 89	HARRISVILLE	UT	84404	LANDSCAPE ROCKS	OGDEN	STR TRUCK	54000
COTA EXCAVATING INC	196 W MEADOW VIEW	OGDEN	UT	84404	DIRT AND ROCK	OGDEN	STR TRUCK	54000
GEC CONSTRUCTION INC	1150 W 24TH ST	OGDEN	UT	84401	LANDSCAPE ROCKS	OGDEN	TRK/TRL	32000
VINCENT TRANSPORTATION	PO BOX 2375	ELK GROVE	CA	95759	ROCK	OGDEN	TRACT/TRL	
C E BUTTERS REALTY AND CONST.	760 N HWY 89	HARRISVILLE	UT	84404	LANDSCAPE ROCKS	WEST HAVEN	STR TRUCK	54000
H O S EXCAVATING INC	4995 S 7500 W	WEBER	UT	84315	LANDSCAPE ROCKS	WEST HAVEN	STR TRUCK	52500
SAMCO	855 VALERIA DR	LAYTON	UT	84041	LANDSCAPE ROCKS	WEST HAVEN	STR TRUCK	64000
WEATHER WORKS	2400 E 6600 S #A	UINTAH	UT	84405	ROCKS	UINTAH	STR TRUCK	11000

Appendix 3 – Retail and wholesale selling prices for stone (Natural flagstone, Dimension stone, Other stone, Manufactured stone).

Source: This tabulation of selling prices was compiled in part from Rentmeister (2004) and Lewis, DeTar, and Gardner (2004)

Consists of 5 parts:

3a. Natural Flagstone
3b. Dimension Stone
3c. Other Stone
3d. Manufactured Stone
3e. Wholesale and retail selling price for stone

Headers: (for each part)

Item	Name of rock quarry or owner
Rock	Rock name
Type cost	Type of cost or price
$	Value
Unit	Unit used
Comments	Comments
Source	Company providing data
Address	Address
Date	Date

Appendix 3a - Retail and Wholesale Selling Prices for Stone (Natural Flagstone)

Item	Rock	Type cost	$	Unit	Comments	Source
Montana Mix Ledge	ledge	Retail	430	Per ton	0.5-2 ft rectangular	Pacific Stonescape
Black Granite Cobble	ledge	Retail	485	Per ton	0.75 ft 5" x 5" x 9"	Pacific Stonescape
B C Tumbled Basalt	ledge	Retail	349	Per ton	0.75 ft vesicular; blocks	Pacific Stonescape
Forest Green Tumbled Granite	ledge	Retail	349	Per ton	1 ft 3" x 3" x 1'; blocks	Pacific Stonescape
Camas Saw Cut	ledge	Retail	560	Per ton	1 ft 4" x 4" x 12"	Pacific Stonescape
Golden Granite Tumbled	ledge	Retail	349	Per ton	1 ft some faces cut	Pacific Stonescape
Salt and Pepper Granite	ledge	Retail	485	Per ton	10 ft 5" x 7" x 10"	Pacific Stonescape
Silver Mica Ledge	ledge	Retail	275	Per ton	1-1.5 ft	Pacific Stonescape
Gold Rush Mica	flagstone	Retail	245	Per ton	1-2 ft	Pacific Stonescape
Gold Veneer	flagstone	Retail	450	Per ton	1-2 ft	Pacific Stonescape
Limelight Green Ledge	ledge	Retail	275	Per ton	1-2 ft blocks	Pacific Stonescape
Torrey Sandstone	flagstone	Retail	495	Per ton	1-2 ft fine crossbed structure; sawcut	Pacific Stonescape
Lone Pine Gold	flagstone	Retail	245	Per ton	1-2 ft micaceous partings	Pacific Stonescape
Iron Mountain Ledge	ledge	Retail	295	Per ton	1-2 ft microlaminations	Pacific Stonescape
Chocolate Charcoal Ledge and Drysta	ledge	Retail	275	Per ton	1-2 ft platy	Pacific Stonescape
Lone Pine Gold Drystack	ledge	Retail	275	Per ton	1-2 ft platy	Pacific Stonescape
Iron Mountain Tumbled Steps	flagstone	Retail	425	Per ton	1-2 ft pyrite cubes to 5 mm; rough surface; laminated	Pacific Stonescape
Green Tumbled Cobbles	flagstone	Retail	445	Per ton	1-2 ft rectangular	Pacific Stonescape
Cold Water Wash Patio	ledge	Retail	255	Per ton	1-2 ft subrounded surfaces; lichen covered; slaby-bloc	Pacific Stonescape
B C Basalt	ledge	Retail	249	Per ton	1-2 ft very fine-grained; rough partings	Pacific Stonescape
Basalt Steps	flagstone	Retail	269	Per ton	1-2 ft vesicular	Pacific Stonescape
Basalt Steps	flagstone	Retail	239	Per ton	1-2 ft vesicular	Pacific Stonescape
Limelight Green Steps	flagstone	Retail	265	Per ton	1-3 ft	Pacific Stonescape
Seaside Antique Flagstone	flagstone	Retail	325	Per ton	1-3 ft	Pacific Stonescape
Sierra Mountain Steps	flagstone	Retail	265	Per ton	1-3 ft	Pacific Stonescape
Sunset Sandstone Ledge	ledge	Retail	415	Per ton	1-3 ft 3" x 5" x various; rectangular; planar microlamin	Pacific Stonescape
Alpine Granite Saw Cut	ledge	Retail	560	Per ton	1-3 ft 3" x 6" x various lengths	Pacific Stonescape
Silver Mica	flagstone	Retail	245	Per ton	1-3 ft micaceous partings	Pacific Stonescape
Iron Mountain Building Stone	ledge	Retail	248	Per ton	1-3 ft platy to blocky slabs	Pacific Stonescape
Gold Mica Ledgestone	ledge	Retail	275	Per ton	1-3 ft rectangular	Pacific Stonescape
Seaside Antique Ledge	ledge	Retail	325	Per ton	1-3 ft rectangular blocks; abundant iron stain; 3" x 5" x	Pacific Stonescape
Montana Mossy Veneer	flagstone	Retail	498	Per ton	1-4 ft rough surfaces	Pacific Stonescape
Montana Mossy Veneer	flagstone	Retail	375	Per ton	1-4 ft rough surfaces	Pacific Stonescape
Lavendar Flagstone	flagstone	Retail	470	Per ton	1-5 ft	Pacific Stonescape
Sierra Mountain Hearts	flagstone	Retail	8.95/each		2 ft chipped heart and square shapes; fissile	Pacific Stonescape
Rose Granite Flagstone	flagstone	Retail	395	Per ton	2 ft rectangular pieces	Pacific Stonescape
Gold Mica Slabs	flagstone	Retail	595	Per ton	2-3 ft quartzite with mica schist surfaces/partings	Pacific Stonescape
Limelight Green Veneer	flagstone	Retail	450	Per ton	2-4 ft	Pacific Stonescape
Buckskin Swirls	flagstone	Retail	295	Per ton	2-4 ft laminated microtexture	Pacific Stonescape
Chocolate Charcoal Mica	flagstone	Retail	425	Per ton	2-4 ft quartzite with micaceous laminations	Pacific Stonescape
Variegated Flagstone	flagstone	Retail	455	Per ton	2-5 ft	Pacific Stonescape
Variegated Flagstone	flagstone	Retail	455	Per ton	2-5 ft dense	Pacific Stonescape
Classic Oak Sandstone	flagstone	Retail	295	Per ton	2-5 ft laminated microtexture	Pacific Stonescape
Tennessee Blue Mountain Flagstone	flagstone	Retail	470	Per ton	2-5 ft micaceous; distinct planar microlaminations	Pacific Stonescape
Iron Mountain Flagstone	flagstone	Retail	395	Per ton	2-5 ft sinuous-planar microlaminations; silt to very fine	Pacific Stonescape
Arizona brown	flagstone, patio	Retail	137.5	Per ton	3/4-1-1/2 inch	3-H Landscape
Cherokee Red	flagstone	Retail	225	Per ton	3/4-1-1/2 inch	3-H Landscape
Gold limestone	flagstone, patio	Retail	225	Per ton	3/4-1-1/2 inch	3-H Landscape
Mauve	flagstone	Retail	225	Per ton	3/4-1-1/2 inch	3-H Landscape
White quartzite	flagstone	Retail	225	Per ton	3/4-1-1/2 inch	3-H Landscape
Peach Sandstone	flagstone	Retail	295	Per ton	3-4 ft laminated microtexture	Pacific Stonescape
Chocolate Charcoal Slabs	flagstone	Retail	595	Per ton	3-4 ft partings along mica laminations	Pacific Stonescape
Sierra Mountain Flagstone	flagstone	Retail	335	Per ton	3-5 ft	Pacific Stonescape
MC Rosa Flagstone	flagstone	Retail	295	Per ton	3-5 ft laminated microtexture	Pacific Stonescape
Limelight Green Flagstone	flagstone	Retail	295	Per ton	3-5 ft micaceous partings; some iron stain	Pacific Stonescape
Iron Mountain Thin Set Flagstone	flagstone	Retail	525	Per ton	3-5 ft planar microlaminated; pyrite aggregates	Pacific Stonescape
Silver Mica Flagstone	flagstone	Retail	295	Per ton	3-5 ft same as Limelight Green Flagstone, but differen	Pacific Stonescape

Appendix 3a - Retail and Wholesale Selling Prices for Stone (Natural Flagstone)

Item	Address	Date
Montana Mix Ledge	Corvallis, OR	2003
Black Granite Cobble	Corvallis, OR	2003
B C Tumbled Basalt	Corvallis, OR	2003
Forest Green Tumbled Granite	Corvallis, OR	2003
Camas Saw Cut	Corvallis, OR	2003
Golden Granite Tumbled	Corvallis, OR	2003
Salt and Pepper Granite	Corvallis, OR	2003
Silver Mica Ledge	Corvallis, OR	2003
Gold Rush Mica	Corvallis, OR	2003
Gold Veneer	Corvallis, OR	2003
Limelight Green Ledge	Corvallis, OR	2003
Torrey Sandstone	Corvallis, OR	2003
Lone Pine Gold	Corvallis, OR	2003
Iron Mountain Ledge	Corvallis, OR	2003
Chocolate Charcoal Ledge and Drysta	Corvallis, OR	2003
Lone Pine Gold Drystack	Corvallis, OR	2003
Iron Mountain Tumbled Steps	Corvallis, OR	2003
Green Tumbled Cobbles	Corvallis, OR	2003
Cold Water Wash Patio	Corvallis, OR	2003
B C Basalt	Corvallis, OR	2003
Basalt Steps	Corvallis, OR	2003
Basalt Steps	Corvallis, OR	2003
Limelight Green Steps	Corvallis, OR	2003
Seaside Antique Flagstone	Corvallis, OR	2003
Sierra Mountain Steps	Corvallis, OR	2003
Sunset Sandstone Ledge	Corvallis, OR	2003
Alpine Granite Saw Cut	Corvallis, OR	2003
Silver Mica	Corvallis, OR	2003
Iron Mountain Building Stone	Corvallis, OR	2003
Gold Mica Ledgestone	Corvallis, OR	2003
Seaside Antique Ledge	Corvallis, OR	2003
Montana Mossy Veneer	Corvallis, OR	2003
Montana Mossy Veneer	Corvallis, OR	2003
Lavendar Flagstone	Corvallis, OR	2003
Sierra Mountain Hearts	Corvallis, OR	2003
Rose Granite Flagstone	Corvallis, OR	2003
Gold Mica Slabs	Corvallis, OR	2003
Limelight Green Veneer	Corvallis, OR	2003
Buckskin Swirls	Corvallis, OR	2003
Chocolate Charcoal Mica	Corvallis, OR	2003
Variegated Flagstone	Corvallis, OR	2003
Variegated Flagstone	Corvallis, OR	2003
Classic Oak Sandstone	Corvallis, OR	2003
Tennessee Blue Mountain Flagstone	Corvallis, OR	2003
Iron Mountain Flagstone	Corvallis, OR	2003
Arizona brown	St George, UT	2004
Cherokee Red	St George, UT	2004
Gold limestone	St George, UT	2004
Mauve	St George, UT	2004
White quartzite	St George, UT	2004
Peach Sandstone	Corvallis, OR	2003
Chocolate Charcoal Slabs	Corvallis, OR	2003
Sierra Mountain Flagstone	Corvallis, OR	2003
MC Rosa Flagstone	Corvallis, OR	2003
Limelight Green Flagstone	Corvallis, OR	2003
Iron Mountain Thin Set Flagstone	Corvallis, OR	2003
Silver Mica Flagstone	Corvallis, OR	2003

Appendix 3a - Retail and Wholesale Selling Prices for Stone (Natural Flagstone)

Item	Rock	Type cost	$	Unit	Comments	Source
Iron Mountain Slabs	flagstone	Retail	198	Per ton	4-5 ft laminated microtexture	Pacific Stonescape
Patio 1-1/2" banded	Flagstone	Retail	240	Per ton	banded	Cedar Landscape Supply
Northern Stone, Oakley, ID	Sunset gold and silver flagstone	Retail	400	Per ton	Flagstone	Am Rock ReadiMix
Northern Stone, Oakley, ID	Gold, Silver, 3/4 -in	Retail	450	Per ton	Flagstone	Basalite
Northern Stone, Oakley, ID	Gold, Silver, 3/4 to 1-1/4 -in	Retail	310	Per ton	Flagstone	Basalite
Northern Stone, Oakley, ID	Sunset gold	Retail	380	Per ton	Flagstone	Brennings Rock
Northern Stone, Oakley, ID	Sunset Gold, 3/4 in veneer	Retail	450	Per ton	Flagstone	Canby Landscape
Northern Stone, Oakley, ID	Gold, Silver, 3/4 -in	Retail	525	Per ton	Flagstone	Carson Masonry
Northern Stone, Oakley, ID	Silver and gold Oakley qtzte	Retail	445	Per ton	Flagstone	Clovis Stone
Northern Stone, Oakley, ID	Silver and gold Oakley qtzte	Retail	430	Per ton	Flagstone	County Bldg Materials
Scrivanich Stone, Oakley, ID	NaturalFlagstone, 1 inch	Retail	337.5	Per ton	Flagstone	HomeDepot
Northern Stone, Oakley, ID	White and gold qtzte	Retail	490	Per ton	Flagstone	Marblehaus
Northern Stone, Oakley, ID	Gold and Silver, 1-1/2 to 2 in	Retail	400	Per ton	Flagstone	MBI ReadiMix
Northern Stone, Turquoise quarry	Sunset bronze 2 in select	Retail	450	Per ton	Flagstone	MBI ReadiMix
Northern Stone, Oakley, ID	Sunset gold 3/4 minus	Retail	700	Per ton	Flagstone	Natural Rock Formations
Northern Stone	Desert Antique	Wholesale	175	Per ton	Flagstone	Northern Stone
Northern Stone	Gold and Silver	Wholesale	275	Per ton	Flagstone	Northern Stone
Northern Stone	Gold and silver, 1/4-3/4 in	Wholesale	325	Per ton	Flagstone	Northern Stone
Northern Stone	Gold and Silver, 1-1/2 to 2 in	Wholesale	225	Per ton	Flagstone	Northern Stone
Northern Stone	Gold and Silver, 1-1/2 to 2 in	Wholesale	225	Per ton	Flagstone	Northern Stone
Northern Stone	Gold, Silver, 3/4 -in	Wholesale	275	Per ton	Flagstone	Northern Stone
Northern Stone	Gold, Silver, 3/4 -in	Wholesale	275	Per ton	Flagstone	Northern Stone
Northern Stone	Gold, Silver, 3/4 -in	Wholesale	275	Per ton	Flagstone	Northern Stone
Northern Stone	Gold, Silver, 3/4 -in	Wholesale	275	Per ton	Flagstone	Northern Stone
Northern Stone	Gold, Silver, 3/4 -in	Wholesale	275	Per ton	Flagstone	Northern Stone
Northern Stone	Gold, Silver, 3/4 -in	Wholesale	325	Per ton	Flagstone	Northern Stone
Northern Stone	Gold, Silver, 3/4 -in	Wholesale	275	Per ton	Flagstone	Northern Stone
Northern Stone	Gold, Silver, 3/4 -in	Wholesale	325	Per ton	Flagstone	Northern Stone
Northern Stone	Gold, Silver, 3/4 -in	Wholesale	325	Per ton	Flagstone	Northern Stone
Northern Stone	Gold, Silver, 3/4 to 1-1/4 -in	Wholesale	225	Per ton	Flagstone	Northern Stone
Northern Stone	Granite	Wholesale	230	Per ton	Flagstone	Northern Stone
Northern Stone	Oakley 3/4-1-1/4 in	Wholesale	225	Per ton	Flagstone	Northern Stone
Northern Stone	Oakley 3/8-3/4 in	Wholesale	325	Per ton	Flagstone	Northern Stone
Northern Stone	Oakley standup	Wholesale	225	Per ton	Flagstone	Northern Stone
Northern Stone	Rocky Mtn quartzite, white, gold, 1 i	Wholesale	225	Per ton	Flagstone	Northern Stone
Northern Stone	Rocky Mtn quartzite, white, gold, 1/2	Wholesale	325	Per ton	Flagstone	Northern Stone
Northern Stone	Silver and gold Oakley qtzte	Wholesale	275	Per ton	Flagstone	Northern Stone
Northern Stone	Silver and gold Oakley qtzte	Wholesale	275	Per ton	Flagstone	Northern Stone
Northern Stone	Silver and gold Oakley qtzte	Wholesale	275	Per ton	Flagstone	Northern Stone
Northern Stone	Sunset gold	Wholesale	225	Per ton	Flagstone	Northern Stone
Northern Stone	Sunset gold	Wholesale	225	Per ton	Flagstone	Northern Stone
Northern Stone	Sunset gold	Wholesale	225	Per ton	Flagstone	Northern Stone
Northern Stone	Sunset gold 3/4 minus	Wholesale	325	Per ton	Flagstone	Northern Stone
Northern Stone	Sunset gold and silver flagstone	Wholesale	275	Per ton	Flagstone	Northern Stone
Northern Stone	Sunset Gold, 3/4 in veneer	Wholesale	225	Per ton	Flagstone	Northern Stone
Northern Stone	White and gold qtzte	Wholesale	275	Per ton	Flagstone	Northern Stone
Northern Stone	Sunset bronze 2 in select	Wholesale	150	Per ton	Flagstone	Northern Stone
Northern Stone, Oakley, ID	Granite	Retail	560	Per ton	Flagstone	Oakhurst Rocks
Northern Stone, Oakley, ID	Silver and gold Oakley qtzte	Retail	560	Per ton	Flagstone	Oakhurst Rocks
Northern Stone, Oakley, ID	Gold, Silver, 3/4 -in	Retail	565	Per ton	Flagstone	Peninsula Building Materia
Northern Stone, Oakley, ID	Gold, Silver, 3/4 -in	Retail	395	Per ton	Flagstone	Peninsula Building Materia
Northern Stone, Oakley, ID	Gold, Silver, 3/4 -in	Retail	465	Per ton	Flagstone	Peninsula Building Materia
Rock Works	Ramshorn	Wholesale	210	Per ton	Flagstone	Rock Works
Northern Stone, Oakley, ID	Desert Antique	Retail	200	Per ton	Flagstone	Rocky Mtn Supply
Northern Stone, Oakley, ID	Oakley standup	Retail	375	Per ton	Flagstone	Rocky Mtn Supply
Rock Works, Challis, ID	Ramshorn	Retail	350	Per ton	Flagstone	Rocky Mtn Supply
Northern Stone, Oakley, ID	Gold, Silver, 3/4 -in	Retail	350	Per ton	Flagstone	Rustic Brick

Appendix 3a - Retail and Wholesale Selling Prices for Stone (Natural Flagstone)

Item	Address	Date
Iron Mountain Slabs	Corvallis, OR	2003
Patio 1-1/2" banded	Cedar City, UT	2004
Northern Stone, Oakley, ID	Salinas, CA	2005
Northern Stone, Oakley, ID	Sparks, NV	2005
Northern Stone, Oakley, ID	Sparks, NV	2005
Northern Stone, Oakley, ID	Citrus Heights, CA	2005
Northern Stone, Oakley, ID	Canby OR	2005
Northern Stone, Oakley, ID	Carson City, NV	2005
Northern Stone, Oakley, ID	Clovis CA	2005
Northern Stone, Oakley, ID	San Jose CA	2005
Scrivanich Stone, Oakley, ID	Spokane, WA	2005
Northern Stone, Oakley, ID	Oah'u, Hawaii	2005
Northern Stone, Oakley, ID	Colfax CA	2005
Northern Stone, Turquoise quarry	Colfax CA	2005
Northern Stone, Oakley, ID	Valley Springs CA	2005
Northern Stone	Oakley, ID	2005
Northern Stone	Oakley, ID	2005
Northern Stone	Oakley, ID	2005
Northern Stone	Oakley, ID	2005
Northern Stone	Oakley, ID	2005
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Northern Stone	Oakley, ID	2005
Northern Stone	Oakley, ID	2005
Northern Stone	Oakley, ID	2005
Northern Stone	Oakley, ID	2005
Northern Stone	Oakley, ID	2005
Northern Stone	Park Valley, UT	2005
Northern Stone, Oakley, ID	Oakhurst CA	2005
Northern Stone, Oakley, ID	Oakhurst CA	2005
Northern Stone, Oakley, ID	Sunnyvale CA	2005
Northern Stone, Oakley, ID	Sunnyvale CA	2005
Northern Stone, Oakley, ID	Sunnyvale CA	2005
Rock Works	Challis, ID	2005
Northern Stone, Oakley, ID	Idaho Falls ID	2005
Northern Stone, Oakley, ID	Idaho Falls ID	2005
Rock Works, Challis, ID	Idaho Falls ID	2005
Northern Stone, Oakley, ID	Sacramento, CA	2005

Appendix 3a - Retail and Wholesale Selling Prices for Stone (Natural Flagstone)

Item	Rock	Type cost	$	Unit	Comments	Source
Northern Stone, Oakley, ID	Gold, Silver, 3/4 -in	Retail	350	Per ton	Flagstone	Sanford Stone
Scrivanich Stone	NaturalFlagstone, 1 inch	Wholesale	170	Per ton	Flagstone	Scrivanich Stone
Northern Stone, Oakley, ID	Gold and silver, 1/4-3/4 in	Retail	420	Per ton	Flagstone	Smitty's Fireplace
Northern Stone, Oakley, ID	Gold and Silver, 1-1/2 to 2 in	Retail	310	Per ton	Flagstone	Smitty's Fireplace
Northern Stone, Oakley, ID	Oakley 3/4-1-1/4 in	Retail	366	Per ton	Flagstone	Squires Brick
Northern Stone, Oakley, ID	Oakley 3/8-3/4 in	Retail	530	Per ton	Flagstone	Squires Brick
Northern Stone, Oakley, ID	Gold, Silver, 3/4 -in	Retail	560	Per ton	Flagstone	Stone Yard
Northern Stone, Oakley, ID	Rocky Mtn quartzite, white, gold, 1 i	Retail	500	Per ton	Flagstone	Sturgis Materials
Northern Stone, Oakley, ID	Rocky Mtn quartzite, white, gold, 1/2	Retail	825	Per ton	Flagstone	Sturgis Materials
Northern Stone, Oakley, ID	Gold, Silver, 3/4 -in	Retail	420	Per ton	Flagstone	Thompson Bldg Materials
Northern Stone, Oakley, ID	Sunset gold	Retail	400	Per ton	Flagstone	TriCity Rock
Northern Stone, Oakley, ID	Gold and Silver	Retail	400	Per ton	Flagstone	Western Concrete
Northern Stone, Oakley, ID	Sunset gold	Retail	500	Per ton	Flagstone	Western Concrete
Nugget Sandstone, flagstone	2”	Retail	250	Per ton	Mining cost, $/ton-100	BMW Stone Inc.
Nugget Sandstone, flagstone	2” supers	Retail	350	Per ton	Mining cost, $/ton-100	BMW Stone Inc.
Nugget Sandstone, flagstone	1”	Retail	450	Per ton	Mining cost, $/ton-110	BMW Stone Inc.
Coconino Sandstone	Flagstone, strip	Wholesale	158	Per ton	Mining cost, $/ton-150	American Stone
Coconino Sandstone	Flagstone, gold, select	Wholesale	120	Per ton	Mining cost, $/ton-50	Levin Stone
Coconino Sandstone	Flagstone, gold, thin minus 1 in	Wholesale	180	Per ton	Mining cost, $/ton-50	Levin Stone
Coconino Sandstone	Flagstone, minus 1 inch	Wholesale	175	Per ton	Mining cost, $/ton-50	Levin Stone
Coconino Sandstone	Flagstone, patio	Wholesale	65	Per ton	Mining cost, $/ton-50	Levin Stone
Coconino Sandstone	Flagstone, select, 1 to 1-3/4 inch	Wholesale	115	Per ton	Mining cost, $/ton-50	Levin Stone
Coconino Sandstone	Flagstone, strip, veneer	Wholesale	142	Per ton	Mining cost, $/ton-50	Levin Stone
Nugget Sandstone, flagstone	Rubble, 5in to 10 in	Retail	105	Per ton	Mining cost, $/ton-60	BMW Stone Inc.
Coconino Sandstone	Flagstone, veneer	Wholesale	120	Per ton	Mining cost, $/ton-65	American Stone
Nugget Sandstone, flagstone	3”	Retail	150	Per ton	Mining cost, $/ton-65	BMW Stone Inc.
Nugget Sandstone, flagstone	3” supers	Retail	250	Per ton	Mining cost, $/ton-65	BMW Stone Inc.
Nugget Sandstone, flagstone	Dry Stack, 3in to 4in	Retail	140	Per ton	Mining cost, $/ton-80	BMW Stone Inc.
Nugget Sandstone, flagstone	Ledge stone 2in to 5 in	Retail	140	Per ton	Mining cost, $/ton-80	BMW Stone Inc.
Coconino Sandstone	Flagstone, patio	Wholesale	160	Per ton	Mining cost, $/ton-98.33	American Stone
Sunrise	Flagstone	Retail	380	Per ton	Sandstone	3-H Landscape
Cherokee Red	Flagstone	Retail	300	Per ton	Sandstone, bronze	3-H Landscape
Autumn Gold	Flagstone (quartzite)	Retail	320	Per ton	silver	3-H Landscape
1"-minus flagstone	Flagstone	Retail	380	Per ton	thin	Cedar Landscape Supply
Patio 1-1/2"-2"	Flagstone	Retail	280	Per ton	unbanded	Cedar Landscape Supply
Yavapai Schist	schist flagstone	Retail	159	Per ton	Wholesale, $/ton-100; Mining cost, $/ton-33	Apache Stone
Yavapai Schist	flagstone, 4 inch veneer	Retail	159	Per ton	Wholesale, $/ton-100; Mining cost, $/ton-41.67	Triple R Stone re: Apache
Yavapai Schist	4 inch veneer	Retail	159	Per ton	Wholesale, $/ton-100; Mining cost, $/ton-44.5	Triple R Stone re: Apache
Yavapai Schist	flagstone, 4 inch strip	Retail	159	Per ton	Wholesale, $/ton-100; Mining cost, $/ton-45.33	Triple R Stone re: Apache
Yavapai Schist	4 inch strip	Retail	159	Per ton	Wholesale, $/ton-100; Mining cost, $/ton-50	Triple R Stone re: Apache
Yavapai Schist	flagstone, thin or strip	Retail	294	Per ton	Wholesale, $/ton-100; Mining cost, $/ton-55.5	Apache Stone
Yavapai Schist	2 inch veneer	Retail	294	Per ton	Wholesale, $/ton-150; Mining cost, $/ton-100	Triple R Stone re: Apache
Yavapai Schist	flagstone, 2 inch thin or strip	Retail	294	Per ton	Wholesale, $/ton-150; Mining cost, $/ton-78.66	Triple R Stone re: Apache
Good Springs quarry	Blanco flagstone	Retail	250	Per ton	Wholesale, $/ton-175; Mining cost, $/ton-57.5	Vegas Rock
Good Springs quarry	Blanco select flagstone	Retail	350	Per ton	Wholesale, $/ton-175; Mining cost, $/ton-57.5	Vegas Rock
Good Springs quarry	Gold patio flagstone	Retail	800	Per ton	Wholesale, $/ton-175; Mining cost, $/ton-57.5	Vegas Rock
Good Springs quarry	Pink ashlar	Retail	225	Per ton	Wholesale, $/ton-175; Mining cost, $/ton-57.5	Vegas Rock
Good Springs quarry	Pink patio flagstone	Retail	200	Per ton	Wholesale, $/ton-175; Mining cost, $/ton-57.5	Vegas Rock
Good Springs quarry	Pink select flagstone	Retail	350	Per ton	Wholesale, $/ton-175; Mining cost, $/ton-57.5	Vegas Rock
Good Springs quarry	Rainbow ashlar	Retail	300	Per ton	Wholesale, $/ton-175; Mining cost, $/ton-57.5	Vegas Rock
Good Springs quarry	Rainbow gold ashlar	Retail	225	Per ton	Wholesale, $/ton-175; Mining cost, $/ton-57.5	Vegas Rock
Good Springs quarry	Rainbow gold patio flagstone	Retail	200	Per ton	Wholesale, $/ton-175; Mining cost, $/ton-57.5	Vegas Rock
Good Springs quarry	Rainbow gold select flagstone	Retail	350	Per ton	Wholesale, $/ton-175; Mining cost, $/ton-57.5	Vegas Rock
Good Springs quarry	Rainbow graded flagstone	Retail	350	Per ton	Wholesale, $/ton-175; Mining cost, $/ton-57.5	Vegas Rock
Good Springs quarry	Rainbow patio flagstone	Retail	200	Per ton	Wholesale, $/ton-175; Mining cost, $/ton-57.5	Vegas Rock
Moenkopi (Torrey, UT)	Flagstone and blocks	Retail	350	Per ton	Wholesale, $/ton-175; Mining cost, $/ton-62	State Stone
Anasazi	random block	Retail	200	Per ton		3-H Landscape

Appendix 3a - Retail and Wholesale Selling Prices for Stone (Natural Flagstone)

Item	Address	Date
Northern Stone, Oakley, ID	Atascadero CA	2005
Scrivanich Stone	Oakley, ID	2005
Northern Stone, Oakley, ID	Helena, MT	2005
Northern Stone, Oakley, ID	Helena, MT	2005
Northern Stone, Oakley, ID	Idaho Falls ID	2005
Northern Stone, Oakley, ID	Idaho Falls ID	2005
Northern Stone, Oakley, ID	Farmersville, CA	2005
Northern Stone, Oakley, ID	Kansas City, KS	2005
Northern Stone, Oakley, ID	Kansas City, KS	2005
Northern Stone, Oakley, ID	Fontana CA	2005
Northern Stone, Oakley, ID	Fremont CA	2005
Northern Stone, Oakley, ID	Cadillac, MI	2005
Northern Stone, Oakley, ID	Cadillac, MI	2005
Nugget Sandstone, flagstone	Riverton, UT	2004
Nugget Sandstone, flagstone	Riverton, UT	2004
Nugget Sandstone, flagstone	Riverton, UT	2004
Coconino Sandstone	Chino Valley, AZ	2004
Coconino Sandstone	Ash Fork, AZ	2004
Coconino Sandstone	Ash Fork, AZ	2004
Coconino Sandstone	Ash Fork, AZ	2004
Coconino Sandstone	Ash Fork, AZ	2004
Coconino Sandstone	Ash Fork, AZ	2004
Coconino Sandstone	Ash Fork, AZ	2004
Nugget Sandstone, flagstone	Riverton, UT	2004
Coconino Sandstone	Chino Valley, AZ	2004
Nugget Sandstone, flagstone	Riverton, UT	2004
Nugget Sandstone, flagstone	Riverton, UT	2004
Nugget Sandstone, flagstone	Riverton, UT	2004
Nugget Sandstone, flagstone	Riverton, UT	2004
Coconino Sandstone	Chino Valley, AZ	2004
Sunrise	St George, UT	2004
Cherokee Red	St George, UT	2004
Autumn Gold	St George, UT	2004
1"-minus flagstone	Cedar City, UT	2004
Patio 1-1/2"-2"	Cedar City, UT	2004
Yavapai Schist	Phoenix, AZ	2004
Yavapai Schist	Stone	2004
Yavapai Schist	Stone	2004
Yavapai Schist	Stone	2004
Yavapai Schist	Stone	2004
Yavapai Schist	Phoenix, AZ	2004
Yavapai Schist	Stone	2004
Yavapai Schist	Stone	2004
Good Springs quarry	Henderson, NV	2004
Good Springs quarry	Henderson, NV	2004
Good Springs quarry	Henderson, NV	2004
Good Springs quarry	Henderson, NV	2004
Good Springs quarry	Henderson, NV	2004
Good Springs quarry	Henderson, NV	2004
Good Springs quarry	Henderson, NV	2004
Good Springs quarry	Henderson, NV	2004
Good Springs quarry	Henderson, NV	2004
Good Springs quarry	Henderson, NV	2004
Good Springs quarry	Henderson, NV	2004
Good Springs quarry	Henderson, NV	2004
Moenkopi (Torrey, UT)	Salt Lake City, UT	2004
Anasazi	St George, UT	2004

Appendix 3a - Retail and Wholesale Selling Prices for Stone (Natural Flagstone)

Item	Rock	Type cost	$	Unit	Comments	Source
Antolini red	flagstone	Retail	360	Per ton		3-H Landscape
Autumn Gold	Cleave rock	Retail	320	Per ton		3-H Landscape
Buckskin	flagstone	Retail	360	Per ton		3-H Landscape
Buckskin	Flagstone (quartzite)	Retail	320	Per ton		3-H Landscape
Cherokee Red	Cleave rock	Retail	300	Per ton		3-H Landscape
Cherokee Red	Flagstone, 1-in select	Retail	480	Per ton		3-H Landscape
Cherokee Red	Flagstone, 2-in select	Retail	440	Per ton		3-H Landscape
Chocolate	flagstone	Retail	440	Per ton		3-H Landscape
Desert Varnish	random block	Retail	187.5	Per ton		3-H Landscape
Glacier Green	random block	Retail	140	Per ton		3-H Landscape
Honey Onyx	random block	Retail	300	Per ton		3-H Landscape
Kyune gray	sandstone	Retail	175	Per ton		3-H Landscape
Mauve	flagstone	Retail	360	Per ton		3-H Landscape
Pine Valley tan	flagstone, patio	Retail	137.5	Per ton		3-H Landscape
Pueblo	flagstone	Retail	400	Per ton		3-H Landscape
Quartzite	flagstone	Retail	360	Per ton		3-H Landscape
Rainbow	random block	Retail	187.5	Per ton		3-H Landscape
Slate, black		Retail	250	Per ton		3-H Landscape
Slate, green		Retail	400	Per ton		3-H Landscape
Slate, purple		Retail	250	Per ton		3-H Landscape
Slate, rainbow		Retail	600	Per ton		3-H Landscape
Slate, red		Retail	400	Per ton		3-H Landscape
Stone Mountain	Flagstone (quartzite)	Retail	320	Per ton		3-H Landscape
Tan limestone	flagstone	Retail	360	Per ton		3-H Landscape
Travertine	block	Retail	425	Per ton		3-H Landscape
Tumbled patio	flagstone	Retail	420	Per ton		3-H Landscape
Flagstone, 1-1/2:-2-1/4"	Sandstone	Wholesale	175	Per ton		Alan Chew
Flagstone, 2-1/2" plus	Sandstone	Wholesale	150	Per ton		Alan Chew
Buckskin quartzite	1 in minus select	Wholesale	250	Per ton		American Stone
Buckskin quartzite	1/2-1 in patio and veneer	Wholesale	150	Per ton		American Stone
Buckskin quartzite	1-2 in select	Wholesale	80	Per ton		American Stone
Buckskin quartzite	1-2 in select	Wholesale	150	Per ton		American Stone
Buckskin quartzite	2-4 in slabs	Wholesale	150	Per ton		American Stone
Klondike Gold quartzite	1/2-1 in patio and veneer	Wholesale	200	Per ton		American Stone
Klondike Gold quartzite	1-2 in patio and veneer	Wholesale	100	Per ton		American Stone
Nevada Ledgestone quartzite	dry stack 12 in minus	Wholesale	60	Per ton		American Stone
Nevada Ledgestone quartzite	natural steps 6 in x 3 ft	Wholesale	150	Per ton		American Stone
Park Valley white quartzite	1/2-1 in patio and veneer	Wholesale	200	Per ton		American Stone
Park Valley white quartzite	1-2 in patio and veneer	Wholesale	100	Per ton		American Stone
Sage Green quartzite	1 - 2 in patio and veneer	Wholesale	100	Per ton		American Stone
Sage Green quartzite	1/2-1 in patio and veneer	Wholesale	200	Per ton		American Stone
Storm Mountain quartzite	1 - 2 in patio and veneer	Wholesale	100	Per ton		American Stone
Storm Mountain quartzite	1 in minus stand up patio, veneer	Wholesale	250	Per ton		American Stone
Storm Mountain quartzite	1/2-1 in patio and veneer	Wholesale	150	Per ton		American Stone
Storm Mountain quartzite	1-2 in select	Wholesale	150	Per ton		American Stone
Storm Mountain quartzite	natural steps 6 in x 3 ft	Wholesale	150	Per ton		American Stone
Storm Mountain quartzite	slabs 2-4 in	Wholesale	150	Per ton		American Stone
Wind Ridge quartzite	1/2-1 in patio and veneer	Wholesale	170	Per ton		American Stone
Wind Ridge quartzite	1-2 in select	Wholesale	140	Per ton		American Stone
Select 1-1/2"-2"	Flagstone	Retail	340	Per ton		Cedar Landscape Supply
Flagstone	Light brown	Wholesale	285	Per ton		Cumberland Gap Hearth S
Arizona flagstone	stack	Retail	340	Per ton		International Stone
Atlantis stacking stone	5in x 7in x 12in	Retail	450	Per ton		International Stone
Blonde	building stone	Retail	350	Per ton		International Stone
Chocolate, Elk Ridge, Glacial	Flagstone	Retail	400	Per ton		International Stone
English	Pavers 1 to 2 in	Retail	500	Per ton		International Stone
Lions Pride	.75 to 1 in	Retail	350	Per ton		International Stone

Appendix 3a - Retail and Wholesale Selling Prices for Stone (Natural Flagstone)

Item	Address	Date
Antolini red	St George, UT	2004
Autumn Gold	St George, UT	2004
Buckskin	St George, UT	2004
Buckskin	St George, UT	2004
Cherokee Red	St George, UT	2004
Cherokee Red	St George, UT	2004
Cherokee Red	St George, UT	2004
Chocolate	St George, UT	2004
Desert Varnish	St George, UT	2004
Glacier Green	St George, UT	2004
Honey Onyx	St George, UT	2004
Kyune gray	St George, UT	2004
Mauve	St George, UT	2004
Pine Valley tan	St George, UT	2004
Pueblo	St George, UT	2004
Quartzite	St George, UT	2004
Rainbow	St George, UT	2004
Slate, black	St George, UT	2004
Slate, green	St George, UT	2004
Slate, purple	St George, UT	2004
Slate, rainbow	St George, UT	2004
Slate, red	St George, UT	2004
Stone Mountain	St George, UT	2004
Tan limestone	St George, UT	2004
Travertine	St George, UT	2004
Tumbled patio	St George, UT	2004
Flagstone, 1-1/2:-2-1/4"	Split Mountain quarry, Vernal,	2004
Flagstone, 2-1/2" plus	Split Mountain quarry, Vernal,	2004
Buckskin quartzite	Oakley ID	2000
Buckskin quartzite	Oakley ID	2000
Buckskin quartzite	Oakley ID	2000
Buckskin quartzite	Oakley ID	2000
Buckskin quartzite	Oakley ID	2000
Klondike Gold quartzite	Oakley ID	2000
Klondike Gold quartzite	Oakley ID	2000
Nevada Ledgestone quartzite	Oakley ID	2000
Nevada Ledgestone quartzite	Oakley ID	2000
Park Valley white quartzite	Oakley ID	2000
Park Valley white quartzite	Oakley ID	2000
Sage Green quartzite	Oakley ID	2000
Sage Green quartzite	Oakley ID	2000
Storm Mountain quartzite	Oakley ID	2000
Storm Mountain quartzite	Oakley ID	2000
Storm Mountain quartzite	Oakley ID	2000
Storm Mountain quartzite	Oakley ID	2000
Storm Mountain quartzite	Oakley ID	2000
Storm Mountain quartzite	Oakley ID	2000
Wind Ridge quartzite	Oakley ID	2000
Wind Ridge quartzite	Oakley ID	2000
Select 1-1/2"-2"	Cedar City, UT	2004
Flagstone	Kemmerer, WY	2005
Arizona flagstone	Boise ID	2004
Atlantis stacking stone	Boise ID	2004
Blonde	Boise ID	2004
Chocolate, Elk Ridge, Glacial	Boise ID	2004
English	Boise ID	2004
Lions Pride	Boise ID	2004

Appendix 3a - Retail and Wholesale Selling Prices for Stone (Natural Flagstone)

Item	Rock	Type cost	$	Unit	Comments	Source
Lions Pride	1.25 to 2 in	Retail	310	Per ton		International Stone
Oakley Buckskin	vertical	Retail	400	Per ton		International Stone
Oakley Gold, Silver, Buckskin	Ledge, steps, walls	Retail	400	Per ton		International Stone
Sedona flagstone		Retail	330	Per ton		International Stone
Three Rivers flagstone	slabs	Retail	500	Per ton		International Stone
Three Rivers flagstone	stack stone	Retail	200	Per ton		International Stone
Twilight	flagstone, 1 to 1.5 in patio	Retail	560	Per ton		International Stone
Big Sky quartzite	1 to 3 in	Retail	413	Per ton		Montana Rockworks
Big Sky quartzite	ashlar	Retail	451	Per ton		Montana Rockworks
Birch Creek bronze	flat stack 1 - 2 in	Retail	250	Per ton		Montana Rockworks
Birch Creek brown	1 in	Retail	418	Per ton		Montana Rockworks
Blue Stone	3/4 to 1 in	Retail	630	Per ton		Montana Rockworks
Castle Rock	Ledge 3 in	Retail	299	Per ton		Montana Rockworks
Castle Rock	Random 1 in	Retail	320	Per ton		Montana Rockworks
Cheyenne Flagstone	1 in to 1-3/4 in	Retail	403	Per ton		Montana Rockworks
Elk Mountain flagstone	3/4 in minus	Retail	420	Per ton		Montana Rockworks
Elk Mountain flagstone	3-5 in random	Retail	255	Per ton		Montana Rockworks
Elk Mountain flagstone	stacked patio 3/4-1-1/4 in	Retail	320	Per ton		Montana Rockworks
Masonry grade	2 to 4 in squares	Retail	292	Per ton		Montana Rockworks
McGregor Lake	Ledge 3 in	Retail	270	Per ton		Montana Rockworks
McGregor Lake	Squares, rectangles	Retail	420	Per ton		Montana Rockworks
McGregor Lake	Tumbled ledge	Retail	285	Per ton		Montana Rockworks
Montana antique	ledge	Retail	326	Per ton		Montana Rockworks
Pennsylvania	3/4 to 1-1/4 in	Retail	460	Per ton		Montana Rockworks
Rocky Mountain	1 to 3 in	Retail	323	Per ton		Montana Rockworks
Rocky Mountain	3 in to 5 in	Retail	315	Per ton		Montana Rockworks
Summit Creek	1 to 3 in	Retail	275	Per ton		Montana Rockworks
Sunrise	Sandstone	Retail	518	Per ton		Montana Rockworks
Sunset Bronze	1 in standup	Retail	378	Per ton		Montana Rockworks
Sunset Bronze	1/2 in standup	Retail	525	Per ton		Montana Rockworks
Sunset Bronze	Flat stack	Retail	250	Per ton		Montana Rockworks
Falls Creek stone	Dry stack	Wholesale	175	Per ton		Montana Stone
Falls Creek stone	Ledge 6 in	Wholesale	255	Per ton		Montana Stone
Glacier Mountain	1 in to 2 in random	Wholesale	260	Per ton		Montana Stone
Glacier Mountain	Dry stack	Wholesale	176	Per ton		Montana Stone
Glacier Mountain	Ledge 6 in	Wholesale	210	Per ton		Montana Stone
Pleasant Valley Prichard	1 in minus stand up	Wholesale	400	Per ton		Montana Stone
Pleasant Valley Prichard	Ledge 6 in	Wholesale	250	Per ton		Montana Stone
Desert Antique	1 to 2 in veneer	Retail	250	Per ton		Northern Stone Supply
Desert Antique	2 to 4 in veneer	Retail	175	Per ton		Northern Stone Supply
Flagstone	Honey ledge, Smooth rustic	Retail	190	Per ton		Northern Stone Supply
Flagstone, 1/4 to 3/4 in veneer	White Mist, Mesquite charcoal, Suns	Retail	325	Per ton		Northern Stone Supply
Flagstone, 3/4-1-1/4 in, veneer	White Mist, Mesquite charcoal, Suns	Retail	225	Per ton		Northern Stone Supply
Rocky Mountain Golden Cloud quartzi	4-8 in veneer masonry stone	Wholesale	140	Per ton		Northern Stone Supply
Rocky Mountain granite	1 to 2 in veneer	Retail	250	Per ton		Northern Stone Supply
Rocky Mountain granite	2 to 4 in veneer	Retail	210	Per ton		Northern Stone Supply
Rocky Mountain granite	Ledgestone veneer	Retail	250	Per ton		Northern Stone Supply
Rocky Mountain quartzite	Flagstone, E-Z set, veneer	Retail	250	Per ton		Northern Stone Supply
Rocky Mountain Sunset Bronze quartz	4 in veneer masonry stone	Wholesale	150	Per ton		Northern Stone Supply
Rocky Mountain Sunset quartzite	2 in thin veneer flagstone	Wholesale	225	Per ton		Northern Stone Supply
Rocky Mountain Turquoise quartzite	Masonry stone, 4-8 in veneer	Wholesale	145	Per ton		Northern Stone Supply
Rocky Mountain White Cloud quartzite	4-8 in veneer masonry stone	Wholesale	175	Per ton		Northern Stone Supply
Rocky Mountain Turquoise quartzite	Masonry stone, 3-5 in veneer	Wholesale	155	Per ton		Northern Stone Supply, Tu
Desert Antique	1 in to 4 in	Wholesale	110	Per ton		Oakley Valley Stone
Flagstone, patio	1.5 to 2 in, gold, silver	Wholesale	120	Per ton		Oakley Valley Stone
Flagstone, silver	1 in to 4 in dry stack	Wholesale	95	Per ton		Oakley Valley Stone
Ledge stone	Honey, gold, silver	Wholesale	120	Per ton		Oakley Valley Stone

Appendix 3a - Retail and Wholesale Selling Prices for Stone (Natural Flagstone)

Item	Address	Date
Lions Pride	Boise ID	2004
Oakley Buckskin	Boise ID	2004
Oakley Gold, Silver, Buckskin	Boise ID	2004
Sedona flagstone	Boise ID	2004
Three Rivers flagstone	Boise ID	2004
Three Rivers flagstone	Boise ID	2004
Twilight	Boise ID	2004
Big Sky quartzite	Kalispell MT	2004
Big Sky quartzite	Kalispell MT	2004
Birch Creek bronze	Kalispell MT	2004
Birch Creek brown	Kalispell MT	2004
Blue Stone	Kalispell MT	2004
Castle Rock	Kalispell MT	2004
Castle Rock	Kalispell MT	2004
Cheyenne Flagstone	Kalispell MT	2004
Elk Mountain flagstone	Kalispell MT	2004
Elk Mountain flagstone	Kalispell MT	2004
Elk Mountain flagstone	Kalispell MT	2004
Masonry grade	Kalispell MT	2004
McGregor Lake	Kalispell MT	2004
McGregor Lake	Kalispell MT	2004
McGregor Lake	Kalispell MT	2004
Montana antique	Kalispell MT	2004
Pennsylvania	Kalispell MT	2004
Rocky Mountain	Kalispell MT	2004
Rocky Mountain	Kalispell MT	2004
Summit Creek	Kalispell MT	2004
Sunrise	Kalispell MT	2004
Sunset Bronze	Kalispell MT	2004
Sunset Bronze	Kalispell MT	2004
Sunset Bronze	Kalispell MT	2004
Falls Creek stone	Marion MT	2004
Falls Creek stone	Marion MT	2004
Glacier Mountain	Marion MT	2004
Glacier Mountain	Marion MT	2004
Glacier Mountain	Marion MT	2004
Pleasant Valley Prichard	Marion MT	2004
Pleasant Valley Prichard	Marion MT	2004
Desert Antique	Oakley ID	2004
Desert Antique	Oakley ID	2004
Flagstone	Oakley ID	2004
Flagstone, 1/4 to 3/4 in veneer	Oakley ID	2004
Flagstone, 3/4-1-1/4 in, veneer	Oakley ID	2004
Rocky Mountain Golden Cloud quartzi	Park Valley, UT	2005
Rocky Mountain granite	Oakley ID	2004
Rocky Mountain granite	Oakley ID	2004
Rocky Mountain granite	Oakley ID	2004
Rocky Mountain quartzite	Oakley ID	2004
Rocky Mountain Sunset Bronze quartz	Park Valley, UT	2005
Rocky Mountain Sunset quartzite	Park Valley, UT	2005
Rocky Mountain Turquoise quartzite	Park Valley, UT	2005
Rocky Mountain White Cloud quartzite	Park Valley, UT	2005
Rocky Mountain Turquoise quartzite	Park Valley, UT	2005
Desert Antique	Oakley ID	2004
Flagstone, patio	Oakley ID	2004
Flagstone, silver	Oakley ID	2004
Ledge stone	Oakley ID	2004

Appendix 3a - Retail and Wholesale Selling Prices for Stone (Natural Flagstone)

Item	Rock	Type cost	$	Unit	Comments	Source
Montana buff	flagstone	Wholesale	200	Per ton		Perma Stone
Chief Joseph		Retail	300	Per ton		Rocky Mountain Supply
Desert Antique	rhyolitic lavas, 2-4 in	Retail	200	Per ton		Rocky Mountain Supply
Iron Mountain argillite	Prichard Formation, Montana	Retail	440	Per ton		Rocky Mountain Supply
Montana Gold		Retail	300	Per ton		Rocky Mountain Supply
Montana Moss rock		Retail	300	Per ton		Rocky Mountain Supply
Oakley quartzite	Patio, ledge	Retail	225	Per ton		Rocky Mountain Supply
Oakley quartzite	Standup	Retail	375	Per ton		Rocky Mountain Supply
St George Sandstone		Retail	300	Per ton		Rocky Mountain Supply
Three Rivers quartzite	patio	Retail	300	Per ton		Rocky Mountain Supply
Three Rivers quartzite	Standup	Retail	400	Per ton		Rocky Mountain Supply
Scrivanich Natural Stone	1.5 to 2 in tumbled	Wholesale	180	Per ton		Scrivanich Natural Stone
Scrivanich Natural Stone	2 ato 6 in ledge	Wholesale	110	Per ton		Scrivanich Natural Stone
Scrivanich Natural Stone	2 to 3 in stepping	Wholesale	115	Per ton		Scrivanich Natural Stone
Scrivanich Natural Stone	3/4 in minus patio	Wholesale	200	Per ton		Scrivanich Natural Stone
Scrivanich Natural Stone	3/4 to 1 in patio	Wholesale	170	Per ton		Scrivanich Natural Stone
Scrivanich Natural Stone	flagstone, 1 to 1.5 in patio	Wholesale	110	Per ton		Scrivanich Natural Stone
Chimney Rock Granite	3 in veneer	Retail	170	Per ton		Spring Creek stone
Chimney Rock Granite	Dry stack	Retail	170	Per ton		Spring Creek stone
Chimney Rock Granite	Flagstone	Retail	210	Per ton		Spring Creek stone
Lightning Creek	3-5 in veneer	Retail	170	Per ton		Spring Creek stone
Lightning Creek	Dry stack	Retail	170	Per ton		Spring Creek stone
Block Mountain	2-3 in flagstone	Retail	385	Per ton		Squires Brick
Oakley	2 man stone	Retail	256	Per ton		Squires Brick
Oakley	stepping stone 3.4-1-1/4 in	Retail	366	Per ton		Squires Brick
Oakley	stepping stone, 3/8-3/4 in	Retail	530	Per ton		Squires Brick
Oakley	dry stack	Retail	223	Per ton		Squires Brick
RW Moss rock		Retail	250	Per ton		Squires Brick
Three Rivers	1.5-2 in patio	Retail	465	Per ton		Squires Brick
Three Rivers	1.5-2 in standup	Retail	450	Per ton		Squires Brick
Three Rivers, quartzi te	masonry ledge	Wholesale	360	Per ton		Three Rivers quarry
Three Rivers, quartzite	1.5 to 2 in select	Wholesale	500	Per ton		Three Rivers quarry
Three Rivers, quartzite	Premium	Wholesale	560	Per ton		Three Rivers quarry
Three Rivers, quartzite	1.5 to 2 in patio	Wholesale	420	Per ton		Three Rivers quarry
Antique Gold	plate	Retail	360	Per ton		Victory Greens
Arizona rose	select	Retail	300	Per ton		Victory Greens
Colorado Buff	select	Retail	500	Per ton		Victory Greens
Elk Mountain flagstone	wallstone	Retail	320	Per ton		Victory Greens
Golden Sunrise flagstone	patio	Retail	240	Per ton		Victory Greens
Golden Sunrise flagstone	plate	Retail	320	Per ton		Victory Greens
Golden Sunrise flagstone	select	Retail	360	Per ton		Victory Greens
Idaho Stone	wallstone	Retail	440	Per ton		Victory Greens
Iron Lake flagstone	select	Retail	400	Per ton		Victory Greens
Yukon Gold, Antique Gold	wallstone	Retail	240	Per ton		Victory Greens

Appendix 3a - Retail and Wholesale Selling Prices for Stone (Natural Flagstone)

Item	Address	Date
Montana buff	Hot Springs, MT	2004
Chief Joseph	Idaho Falls, ID	2004
Desert Antique	Idaho Falls, ID	2004
Iron Mountain argillite	Idaho Falls, ID	2004
Montana Gold	Idaho Falls, ID	2004
Montana Moss rock	Idaho Falls, ID	2004
Oakley quartzite	Idaho Falls, ID	2004
Oakley quartzite	Idaho Falls, ID	2004
St George Sandstone	Idaho Falls, ID	2004
Three Rivers quartzite	Idaho Falls, ID	2004
Three Rivers quartzite	Idaho Falls, ID	2004
Scrivanich Natural Stone	Oakley ID	2004
Scrivanich Natural Stone	Oakley ID	2004
Scrivanich Natural Stone	Oakley ID	2004
Scrivanich Natural Stone	Oakley ID	2004
Scrivanich Natural Stone	Oakley ID	2004
Scrivanich Natural Stone	Oakley ID	2004
Chimney Rock Granite	Hope ID	2004
Chimney Rock Granite	Hope ID	2004
Chimney Rock Granite	Hope ID	2004
Lightning Creek	Hope ID	2004
Lightning Creek	Hope ID	2004
Block Mountain	Idaho Falls, ID	2004
Oakley	Idaho Falls, ID	2004
Oakley	Idaho Falls, ID	2004
Oakley	Idaho Falls, ID	2004
Oakley	Idaho Falls, ID	2004
RW Moss rock	Idaho Falls, ID	2004
Three Rivers	Idaho Falls, ID	2004
Three Rivers	Idaho Falls, ID	2004
Three Rivers, quartzi te	Challis, ID	2004
Three Rivers, quartzite	Challis, ID	2004
Three Rivers, quartzite	Challis, ID	2004
Three Rivers, quartzite	Challis, ID	2004
Antique Gold	Meridian, ID	2004
Arizona rose	Meridian, ID	2004
Colorado Buff	Meridian, ID	2004
Elk Mountain flagstone	Meridian, ID	2004
Golden Sunrise flagstone	Meridian, ID	2004
Golden Sunrise flagstone	Meridian, ID	2004
Golden Sunrise flagstone	Meridian, ID	2004
Idaho Stone	Meridian, ID	2004
Iron Lake flagstone	Meridian, ID	2004
Yukon Gold, Antique Gold	Meridian, ID	2004

Appendix 3b - Retail and Wholesale Selling Prices for Stone (Dimension Stone)

Item	Rock	Type cost	$	Unit	Comments	Source
* Hearths, mantles	Sandstone	Wholesale	9	Per sq foot	>4 ft long or <24 in widex1-1/2"-3" thick	Alan Chew
Capp stones 10"-20"	Sandstone	Wholesale	8 to 10	Per sq foot	18-48" long and 1-1/2-3" thick	Alan Chew
Capp stones 6"-10"	Sandstone	Wholesale	7	Per sq foot	18-48" long and 1-1/2-3" thick	Alan Chew
Large block >8 sq ft, 1" thick	Flagstone	Wholesale	300	Per ton		Alan Chew
Small block 1" thick	Flagstone	Wholesale	240	Per ton		Alan Chew
Montana buff	Sandstone	Wholesale	250	Per ton		Jake Cremer
2" thick cut dimension stone		Wholesale	21	Per sq ft		State Stone saw plant
3" thick cut dimension stone		Wholesale	22	Per sq ft		State Stone saw plant
4" thick cus dimension stone		Wholesale	23	Per sq ft		State Stone saw plant
* If >24" wide, $0.15/in for each each over 24"; for every inch >3in thick, $1.50/ft added to base; for length, for every 1 foot over 4 ft, add $1.25/ft						

Appendix 3b - Retail and Wholesale Selling Prices for Stone (Dimension Stone)

Item	Address	Date
* Hearths, mantles	Split Mountain quarry, Vernal, UT	2004
Capp stones 10"-20"	Split Mountain quarry, Vernal, UT	2004
Capp stones 6"-10"	Split Mountain quarry, Vernal, UT	2004
Large block >8 sq ft, 1" thick	Split Mountain quarry, Vernal, UT	2004
Small block 1" thick	Split Mountain quarry, Vernal, UT	2004
Montana buff	Hot Springs, MT	2004
2" thick cut dimension stone	Torrey, UT	2004
3" thick cut dimension stone	Torrey, UT	2004
4" thick cus dimension stone	Torrey, UT	2004
* If >24" wide, $0.15/in for eac		

Appendix 3c - Retail and Wholesale Selling Prices for Stone (Other stone)

Item	Rock	Type cost	$	Unit	Comments
Arizona River Rock	1-in, 1.5-3 in, 3 to 8 in	Retail	60	Cu yard	Cobble
Boulders	Rhyolite	Retail	80	Per ton	Peaches n Cream
Desert Cobble		Retail	35	Cu yard	Cobble
Fire Rock	1 in, 2-4 in, 1/2 in	Retail	40	Cu yard	Crushed
Peaches n Cream	Rhyolite	Retail	37.5	Cu yard	Crushed
Utah Gold		Retail	32.5	Cu yard	Crushed
Northern Stone, Turquoise	Turquoise rubble	Retail	325	Per ton	Ledge
Northern Stone, Turquoise	Turquoise, ledge	Retail	314	Per ton	Ledge
Northern Stone, Oakley, ID	Honey Ledge	Retail	285	Per ton	Ledge
Northern Stone, Oakley, ID	Desert Antique 2-4 in	Retail	320	Per ton	Ledge
Northern Stone, Oakley, ID	Desert Antique 1-2 in	Retail	330	Per ton	Ledge
Northern Stone, Turquoise	Boulders, turquoise	Retail	250	Per ton	Boulders
Northern Stone, Turquoise	Turq. Ledge	Retail	260	Per ton	Ledge
Northern Stone, Oakley, ID	Honey Ledge	Retail	320	Per ton	Ledge
Northern Stone, Turquoise	Turquoise rubble	Retail	480	Per ton	Ledge
Northern Stone, Turquoise	Turquoise, landscape aggregate	Retail	160	Per ton	Aggregate
Northern Stone, Turquoise	Turquoise boulders	Retail	295	Per ton	Boulders
Northern Stone, Turquoise	Turquoise, ledge	Retail	325	Per ton	Ledge
Northern Stone, Turquoise	White Cloud, Golden Cloud, Turquoise, ledge	Retail	295	Per ton	Ledge
Jasper, crushed 1"-3"	Rhyolite	Retail	45	Per ton	Crushed
Anasazi	boulders	Retail	80	Per ton	block
Black lava	boulders	Retail	25	Per ton	block
Desert Varnish	24 in to 72 in	Retail	112.5	Per ton	block
Desert Varnish	boulders	Retail	160	Per ton	block
Glacier Green		Retail	150	Per ton	block
Gray granite	boulders	Retail	40	Per ton	block
Rainbow	12 in- 72 in	Retail	150	Per ton	block
Rainbow	boulders	Retail	200	Per ton	block
Red sandstone	boulders	Retail	80	Per ton	block
Surface lava	boulders	Retail	80	Per ton	block
Zebra rock	Limestone, banded	Retail	250	Per ton	block
Northern Stone, Turquoise	Gravel, 1/2 - 7/8 in	Retail	259	Cu yard	Aggregate
Northern Stone, Turquoise	Boulders, turquoise	Retail	393	Per ton	Boulders
Northern Stone, Turquoise	Rubble, 3-5 in	Retail	455	Per ton	Ledge
Northern Stone, Turquoise	Turquoise, landscape aggregate	Retail	99.6	Per ton	Aggregate
Basalt columns	12 in- 72 in	Retail	275	Per ton	
Basalt columns	24 in	Retail	153	Per ton	
Basalt columns	bird baths	Retail	425	Per ton	
Big Sky Granite	1-3 in mosaic	Retail	420	Per ton	
Big Sky Granite	ashlar	Retail	466	Per ton	
Farmers rock	2-3 in	Retail	274	Per ton	
Farmers rock	5-7 in	Retail	252	Per ton	
River Rock	rainbow	Retail	158	Per ton	
Rocky Mountain	6-12 in boulders	Retail	238	Per ton	
Northern Stone, Oakley, ID	Honey Ledge	Retail	220	Per ton	Ledgestone
Northern Stone, Turquoise	Ledge	Retail	400	Per ton	Ledge
Glacier Green Boulders	boulders	Retail	255	Per ton	1-2 ft blocky
Green Tumbled Cobbles	boulders/cobbles	Retail	445	Per ton	<1 ft rectangular
Northern Stone, Turquoise	Turquoise, boulders	Retail	265	Per ton	Boulders
Northern Stone, Turquoise	Turquoise, rubble, 1/8 in	Retail	250	Per ton	Ledge
Northern Stone, Turquoise	Flagstone, veneer	Retail	325	Per ton	Ledge
Northern Stone, Turquoise	White Cloud	Retail	265	Per ton	Ledge
Osaka Blue Boulders	boulders/cobbles	Retail	275	Per ton	<2 ft well rounded; some vesicular
Rainbow Boulders	boulders	Retail	285	Per ton	1-3 ft subrounded
Rainbow Flatjacks	cobbles	Retail	215	Per ton	ft subrounded; platy
S & P Granite Boulders	boulders/cobbles	Retail	245	Per ton	1-3 ft well rounded; some cobbles

Item	Source	Address	Date
Arizona River Rock	3-H Landscape	St. George, UT	2004
Boulders	3-H Landscape	St. George, UT	2004
Desert Cobble	3-H Landscape	St. George, UT	2004
Fire Rock	3-H Landscape	St. George, UT	2004
Peaches n Cream	3-H Landscape	St. George, UT	2004
Utah Gold	3-H Landscape	St. George, UT	2004
Northern Stone, Turquoise	Am Rock ReadiMix	Salinas, CA	2005
Northern Stone, Turquoise	Apache Stone	Phoenix AZ	2005
Northern Stone, Oakley, ID	Basalite	Sparks, NV	2005
Northern Stone, Oakley, ID	Basalite	Sparks, NV	2005
Northern Stone, Oakley, ID	Basalite	Sparks, NV	2005
Northern Stone, Turquoise	Bouget Bros	Santa Monica CA	2005
Northern Stone, Turquoise	Bouget Bros	Santa Monica CA	2005
Northern Stone, Oakley, ID	Brennings Rock	Citrus Heights, CA	2005
Northern Stone, Turquoise	Brennings Rock	Citrus Heights, CA	2005
Northern Stone, Turquoise	Canby Landscape	Canby OR	2005
Northern Stone, Turquoise	Canby Landscape	Canby OR	2005
Northern Stone, Turquoise	Canby Landscape	Canby OR	2005
Northern Stone, Turquoise	Canby Landscape	Canby OR	2005
Jasper, crushed 1"-3"	Cedar Landscape Supply	Cedar City, UT	2004
Anasazi	Feller Stone	Veyo, UT	2004
Black lava	Feller Stone	Veyo, UT	2004
Desert Varnish	Feller Stone	Veyo, UT	2004
Desert Varnish	Feller Stone	Veyo, UT	2004
Glacier Green	Feller Stone	Veyo, UT	2004
Gray granite	Feller Stone	Veyo, UT	2004
Rainbow	Feller Stone	Veyo, UT	2004
Rainbow	Feller Stone	Veyo, UT	2004
Red sandstone	Feller Stone	Veyo, UT	2004
Surface lava	Feller Stone	Veyo, UT	2004
Zebra rock	Feller Stone	Veyo, UT	2004
Northern Stone, Turquoise	KRC Rock	San Marcos CA	2005
Northern Stone, Turquoise	KRC Rock	San Marcos CA	2005
Northern Stone, Turquoise	KRC Rock	San Marcos CA	2005
Northern Stone, Turquoise	Miller landscape	Hyrum, UT	2005
Basalt columns	Montana Rockworks	Kalispell MT	2004
Basalt columns	Montana Rockworks	Kalispell MT	2004
Basalt columns	Montana Rockworks	Kalispell MT	2004
Big Sky Granite	Montana Rockworks	Kalispell MT	2004
Big Sky Granite	Montana Rockworks	Kalispell MT	2004
Farmers rock	Montana Rockworks	Kalispell MT	2004
Farmers rock	Montana Rockworks	Kalispell MT	2004
River Rock	Montana Rockworks	Kalispell MT	2004
Rocky Mountain	Montana Rockworks	Kalispell MT	2004
Northern Stone, Oakley, ID	Oakhurst Rocks	Oakhurst CA	2005
Northern Stone, Turquoise	Oakhurst Rocks	Oakhurst CA	2005
Glacier Green Boulders	Pacific Stonescape	Corvallis, OR	2004
Green Tumbled Cobbles	Pacific Stonescape	Corvallis, OR	2003
Northern Stone, Turquoise	Pacific Stonescape	Eugene OR	2005
Northern Stone, Turquoise	Pacific Stonescape	Eugene OR	2005
Northern Stone, Turquoise	Pacific Stonescape	Eugene OR	2005
Northern Stone, Turquoise	Pacific Stonescape	Eugene OR	2005
Osaka Blue Boulders	Pacific Stonescape	Corvallis, OR	2004
Rainbow Boulders	Pacific Stonescape	Corvallis, OR	2004
Rainbow Flatjacks	Pacific Stonescape	Corvallis, OR	2004
S & P Granite Boulders	Pacific Stonescape	Corvallis, OR	2004

Item	Rock	Type cost	$	Unit	Comments
Santiam Flatjacks	cobbles/boulders	Retail	175	Per ton	<1.5 ft rounded; platy; some vesicular
Serpentine	boulders/cobbles	Retail	500	Per ton	<1 ft subangular
White Cloud Boulders	boulders	Retail	265	Per ton	1-2 ft blocky
Northern Stone, Turquoise	White Cloud 4 in	Retail	430	Per ton	Ledge
Three Rivers	river rock	Retail	225	Per ton	
Northern Stone, Oakley, ID	Oakley ledge	Retail	225	Per ton	Ledge
Northern Stone, Turquoise	Turquoise	Retail	530	Per ton	Ledge
Northern Stone, Oakley, ID	Honey Ledge	Retail	350	Per ton	Ledge
Northern Stone, Turquoise	Turquoise aggregate	Retail	225	Per ton	Aggregate
Northern Stone, Turquoise	White cloud aggregate	Retail	225	Per ton	Aggregate
Northern Stone, Turquoise	Turquoise landscape	Retail	200	Per ton	Ledge
Northern Stone, Oakley, ID	Oakley ledge	Retail	223	Per ton	Ledge
Northern Stone, Turquoise	Turquoise, boulders	Retail	430	Per ton	Boulders
Northern Stone, Turquoise	Golden cloud, white cloud	Retail	430	Per ton	Ledge
Northern Stone, Oakley, ID	Honey Ledge	Retail	280	Per ton	Ledge
Northern Stone, Turquoise	Turquoise rubble	Wholesale	125	Per ton	Ledge
Wind Ridge quartzite	Bulk boulders	Wholesale	50	Per ton	
Wind Ridge quartzite	Rubble	Wholesale	85	Per ton	
Northern Stone, Turquoise	Turquoise, ledge	Wholesale	120	Per ton	Ledge
Northern Stone, Oakley, ID	Honey Ledge	Wholesale	190	Per ton	Ledge
Northern Stone, Oakley, ID	Desert Antique 2-4 in	Wholesale	175	Per ton	Ledge
Northern Stone, Oakley, ID	Desert Antique 1-2 in	Wholesale	250	Per ton	Ledge
Northern Stone, Turquoise	Boulders, turquoise	Wholesale	120	Per ton	Boulders
Northern Stone, Turquoise	Turq. Ledge	Wholesale	135	Per ton	Ledge
Northern Stone, Turquoise	Turq. Aggregate, 1/4-3/8 in	Wholesale		Per ton	Aggregate
Northern Stone, Oakley, ID	Honey Ledge	Wholesale	190	Per ton	Ledge
Northern Stone, Turquoise	Turquoise rubble	Wholesale	135	Per ton	Ledge
Northern Stone, Turquoise	Turquoise, landscape aggregate	Wholesale	40	Per ton	Aggregate
Northern Stone, Turquoise	Turquoise boulders	Wholesale	125	Per ton	Boulders
Northern Stone, Turquoise	Turquoise, ledge	Wholesale	120	Per ton	Ledge
Northern Stone, Turquoise	White Cloud, Golden Cloud, Turquoise, ledge	Wholesale	90	Per ton	Ledge
Northern Stone, Turquoise	Gravel, 1/2 - 7/8 in	Wholesale	45	Per ton	Aggregate
Northern Stone, Turquoise	Boulders, turquoise	Wholesale	120	Per ton	Boulders
Northern Stone, Turquoise	Rubble, 3-5 in	Wholesale	120	Per ton	Ledge
Northern Stone, Turquoise	Turquoise, landscape aggregate	Wholesale	40	Per ton	Aggregate
Antique	boulders	Wholesale	150	Per ton	
Falls Creek Stone	boulders	Wholesale	150	Per ton	
Rainbow cobble	river rock	Wholesale	185	Per ton	
Rainbow cobble	gold select	Wholesale	185	Per ton	
Rocky Mountain Golden Cloud quartzite	Landscape boulders	Wholesale	100	Per ton	
Rocky Mountain Golden Cloud quartzite	Small landscape boulders	Wholesale	110	Per ton	
Rocky Mountain granite	Cobbles	Wholesale	200	Per ton	
Rocky Mountain quartzite	Dry stream bed landscape stone	Wholesale	90	Per ton	
Rocky Mountain quartzite	Aquarium nugget specialty stone	Wholesale	300	Per ton	
Rocky Mountain turquoise quartzite	Landscape boulders	Wholesale	140	Per ton	
Rocky Mountain turquoise quartzite	specimen boulders	Wholesale	150	Per ton	
Rocky Mountain turquoise quartzite	Oro Verde 1/4 in aquarium	Wholesale	95	Per ton	
Northern Stone, Oakley, ID	Honey Ledge	Wholesale	190	Per ton	Ledgestone
Northern Stone, Turquoise	Ledge	Wholesale	155	Per ton	Ledge
Landscape boulders	mixed colors	Wholesale	95	Per ton	
Maxi blocks	mixed colors	Wholesale	120	Per ton	
Quartzite chips	1/2 in minus	Wholesale	125	Per ton	
Quartzite, flat pack	3/4 in minus	Wholesale	85	Per ton	
Quartzite, gold, silver, charcoal	3/4 in minus, flagstone	Wholesale	180	Per ton	
Northern Stone, Turquoise	Turquoise, boulders	Wholesale	125	Per ton	Boulders
Northern Stone, Turquoise	Turquoise, rubble, 1/8 in	Wholesale	90	Per ton	Ledge

Item	Source	Address	Date
Santiam Flatjacks	Pacific Stonescape	Corvallis, OR	2004
Serpentine	Pacific Stonescape	Corvallis, OR	2004
White Cloud Boulders	Pacific Stonescape	Corvallis, OR	2004
Northern Stone, Turquoise	Resource Bldg Matls.	Downey CA	2005
Three Rivers	Rocky Mountain Supply	Idaho Falls, ID	2004
Northern Stone, Oakley, ID	Rocky Mtn Supply	Idaho Falls ID	2005
Northern Stone, Turquoise	Ruck Bros Brick	Ft Myers, FL	2005
Northern Stone, Oakley, ID	Rustic Brick	Sacramento, CA	2005
Northern Stone, Turquoise	Sanford Stone	Atascadero CA	2005
Northern Stone, Turquoise	Sanford Stone	Atascadero CA	2005
Northern Stone, Turquoise	Sanford Stone	Atascadero CA	2005
Northern Stone, Oakley, ID	Squires Brick	Idaho Falls ID	2005
Northern Stone, Turquoise	Sturgis Materials	Kansas City, KS	2005
Northern Stone, Turquoise	Sturgis Materials	Kansas City, KS	2005
Northern Stone, Oakley, ID	Thompson Bldg Materials	Fontana CA	2005
Northern Stone, Turquoise	Am Rock ReadiMix	Salinas, CA	2005
Wind Ridge quartzite	American Stone	Oakley ID	2000
Wind Ridge quartzite	American Stone	Oakley ID	2000
Northern Stone, Turquoise	Apache Stone	Phoenix AZ	2005
Northern Stone, Oakley, ID	Basalite	Sparks, NV	2005
Northern Stone, Oakley, ID	Basalite	Sparks, NV	2005
Northern Stone, Oakley, ID	Basalite	Sparks, NV	2005
Northern Stone, Turquoise	Bouget Bros	Santa Monica CA	2005
Northern Stone, Turquoise	Bouget Bros	Santa Monica CA	2005
Northern Stone, Turquoise	Bourget Bros	Santa Monica CA	2005
Northern Stone, Oakley, ID	Brennings Rock	Citrus Heights, CA	2005
Northern Stone, Turquoise	Brennings Rock	Citrus Heights, CA	2005
Northern Stone, Turquoise	Canby Landscape	Canby OR	2005
Northern Stone, Turquoise	Canby Landscape	Canby OR	2005
Northern Stone, Turquoise	Canby Landscape	Canby OR	2005
Northern Stone, Turquoise	Canby Landscape	Canby OR	2005
Northern Stone, Turquoise	KRC Rock	San Marcos CA	2005
Northern Stone, Turquoise	KRC Rock	San Marcos CA	2005
Northern Stone, Turquoise	KRC Rock	San Marcos CA	2005
Northern Stone, Turquoise	Miller landscape	Hyrum, UT	2005
Antique	Montana Stone	Marion MT	2004
Falls Creek Stone	Montana Stone	Marion MT	2004
Rainbow cobble	Montana Stone	Marion MT	2004
Rainbow cobble	Montana Stone	Marion MT	2004
Rocky Mountain Golden Cloud quartzite	Northern Stone Supply	Park Valley Ut	2005
Rocky Mountain Golden Cloud quartzite	Northern Stone Supply	Park Valley Ut	2005
Rocky Mountain granite	Northern Stone Supply	Oakley ID	2004
Rocky Mountain quartzite	Northern Stone Supply	Park Valley Ut	2005
Rocky Mountain quartzite	Northern Stone Supply	Park Valley Ut	2005
Rocky Mountain turquoise quartzite	Northern Stone Supply	Park Valley Ut	2005
Rocky Mountain turquoise quartzite	Northern Stone Supply	Park Valley Ut	2005
Rocky Mountain turquoise quartzite	Northern Stone Supply	Park Valley Ut	2005
Northern Stone, Oakley, ID	Oakhurst Rocks	Oakhurst CA	2005
Northern Stone, Turquoise	Oakhurst Rocks	Oakhurst CA	2005
Landscape boulders	Oakley Valley Stone	Oakley ID	2004
Maxi blocks	Oakley Valley Stone	Oakley ID	2004
Quartzite chips	Oakley Valley Stone	Oakley ID	2004
Quartzite, flat pack	Oakley Valley Stone	Oakley ID	2004
Quartzite, gold, silver, charcoal	Oakley Valley Stone	Oakley ID	2004
Northern Stone, Turquoise	Pacific Stonescape	Eugene OR	2005
Northern Stone, Turquoise	Pacific Stonescape	Eugene OR	2005

Appendix 3c - Retail and Wholesale Selling Prices for Stone (Other stone)

Item	Rock	Type cost	$	Unit	Comments
Northern Stone, Turquoise	Flagstone, veneer	Wholesale	135	Per ton	Ledge
Northern Stone, Turquoise	White Cloud	Wholesale	125	Per ton	Ledge
Northern Stone, Turquoise	White Cloud 4 in	Wholesale	120	Per ton	Ledge
Northern Stone, Oakley, ID	Oakley ledge	Wholesale	190	Per ton	Ledge
Northern Stone, Turquoise	Turquoise	Wholesale	135	Per ton	Ledge
Northern Stone, Oakley, ID	Honey Ledge	Wholesale	190	Per ton	Ledge
Northern Stone, Turquoise	Turquoise aggregate	Wholesale	45	Per ton	Aggregate
Northern Stone, Turquoise	White cloud aggregate	Wholesale	45	Per ton	Aggregate
Northern Stone, Turquoise	Turquoise landscape	Wholesale	115	Per ton	Ledge
Northern Stone, Oakley, ID	Oakley ledge	Wholesale	190	Per ton	Ledge
Northern Stone, Turquoise	Turquoise, boulders	Wholesale	150	Per ton	Boulders
Northern Stone, Turquoise	Golden cloud, white cloud	Wholesale	90	Per ton	Ledge
Northern Stone, Oakley, ID	Honey Ledge	Wholesale	190	Per ton	Ledge
Indonesian pebbles		Wholesale	1900	Per ton	
Three Rivers	Landscape boulders	Wholesale	200	Per ton	

Appendix 3c - Retail and Wholesale Selling Prices for Stone (Other stone)

Item	Source	Address	Date
Northern Stone, Turquoise	Pacific Stonescape	Eugene OR	2005
Northern Stone, Turquoise	Pacific Stonescape	Eugene OR	2005
Northern Stone, Turquoise	Resource Bldg Matls.	Downey CA	2005
Northern Stone, Oakley, ID	Rocky Mtn Supply	Idaho Falls ID	2005
Northern Stone, Turquoise	Ruck Bros Brick	Ft Myers, FL	2005
Northern Stone, Oakley, ID	Rustic Brick	Sacramento, CA	2005
Northern Stone, Turquoise	Sanford Stone	Atascadero CA	2005
Northern Stone, Turquoise	Sanford Stone	Atascadero CA	2005
Northern Stone, Turquoise	Sanford Stone	Atascadero CA	2005
Northern Stone, Oakley, ID	Squires Brick	Idaho Falls ID	2005
Northern Stone, Turquoise	Sturgis Materials	Kansas City, KS	2005
Northern Stone, Turquoise	Sturgis Materials	Kansas City, KS	2005
Northern Stone, Oakley, ID	Thompson Bldg Materials	Fontana CA	2005
Indonesian pebbles	Three Rivers Stone	Challis, ID	2004
Three Rivers	Three Rivers Stone	Challis, ID	2004

Appendix 3d - Retail and Wholesale Selling Prices for Stone (Manufactured stone)

Type cost	$	Unit	Comments	Source	Address
Retail	5	Per sq foot	12"x30"x2" or 20"x20"x2"	Eldorado Stone	San Marcos CA 800-925-1471 www.eldoradostone.
Retail	6	Per linear foot	12"x30"x2" or 20"x20"x2"	Eldorado Stone	San Marcos CA 800-925-1471 www.eldoradostone.
Retail	2.29	Per sq foot		3-H Stone	St. George, UT
Retail	4.48	Per sq foot		3-H Stone	St. George, UT

Appendix 3e - Retail and wholesale selling price for stone

NO	Wholesaler	Retailer	Retailer address	State	StoneDesc.	Type_Rock	Wholesale	Retail	Unit	Date
17	Northern Stone, Turquoise quarry	Sanford Stone	Atascadero CA	CA	Turquoise aggregate	Aggregate	45	225	ton	2005
19	Northern Stone, Turquoise quarry	Sanford Stone	Atascadero CA	CA	White cloud aggregate	Aggregate	45	225	ton	2005
27	Northern Stone, Turquoise quarry	KRC Rock	San Marcos CA	CA	Gravel, 1/2 - 7/8 in	Aggregate	45	259	cu yd	2005
28	Northern Stone, Turquoise quarry	Bouget Bros	Santa Monica CA	CA	Turquoise, Aggregate, 1/4-3/8 in	Aggregate				2005
31	Northern Stone, Turquoise quarry	Miller landscape	Hyrum, UT	UT	Turquoise, landscape aggregate	Aggregate	40	99.6	ton	2005
33	Northern Stone, Turquoise quarry	Canby Landscape	Canby OR	OR	Turquoise, landscape aggregate	Aggregate	40	160	ton	2005
25	Northern Stone, Turquoise quarry	KRC Rock	San Marcos CA	CA	Boulders, turquoise	Boulders	120	393	ton	2005
30	Northern Stone, Turquoise quarry	Bouget Bros	Santa Monica CA	CA	Boulders, turquoise	Boulders	120	250	ton	2005
36	Northern Stone, Turquoise quarry	Canby Landscape	Canby OR	OR	Turquoise boulders	Boulders	125	295	ton	2005
38	Northern Stone, Turquoise quarry	Pacific Stonescape	Eugene OR	OR	Turquoise, boulders	Boulders	125	265	ton	2005
57	Northern Stone, Turquoise quarry	Sturgis Materials	Kansas City, KS	KS	Turquoise, boulders	Boulders	150	430	ton	2005
1	Scrivanich Stone, Oakley, ID	HomeDepot	Spokane, WA	WA	NaturalFlagstone, 1 inch	Flagstone	170	337.5	ton	2005
2	Northern Stone, Oakley, ID	Carson Masonry	Carson City, NV	NV	Gold, Silver, 3/4 -in	Flagstone	275	525	ton	2005
3	Northern Stone, Oakley, ID	Marblehaus	Oah'u, Hawaii	HI	White and gold qtzte	Flagstone	275	490	ton	2005
4	Northern Stone, Oakley, ID	County Bldg Materials	San Jose CA	CA	Silver and gold Oakley qtzte	Flagstone	275	430	ton	2005
5	Northern Stone, Oakley, ID	Clovis Stone	Clovis CA	Ca	Silver and gold Oakley qtzte	Flagstone	275	445	ton	2005
6	Northern Stone, Oakley, ID	Oakhurst Rocks	Oakhurst CA	CA	Silver and gold Oakley qtzte	Flagstone	275	560	ton	2005
7	Northern Stone, Oakley, ID	Oakhurst Rocks	Oakhurst CA	CA	Granite	Flagstone	230	560	ton	2005
10	Northern Stone, Oakley, ID	Rustic Brick	Sacramento, CA	CA	Gold, Silver, 3/4 -in	Flagstone	275	350	ton	2005
12	Northern Stone, Oakley, ID	TriCity Rock	Fremont CA	CA	Sunset gold	Flagstone	225	400	ton	2005
13	Northern Stone, Oakley, ID	Natural Rock Formations	Valley Springs CA	CA	Sunset gold 3/4 minus	Flagstone	325	700	ton	2005
14	Northern Stone, Oakley, ID	Stone Yard	Farmersville, CA	CA	Gold, Silver, 3/4 -in	Flagstone	275	560	ton	2005
15	Northern Stone, Oakley, ID	Thompson Bldg Materials	Fontana CA	CA	Gold, Silver, 3/4 -in	Flagstone	275	420	ton	2005
20	Northern Stone, Oakley, ID	Sanford Stone	Atascadero CA	CA	Gold, Silver, 3/4 -in	Flagstone	275	350	ton	2005
21	Northern Stone, Oakley, ID	Peninsula Building Materials	Sunnyvale CA	CA	Gold, Silver, 3/4 -in	Flagstone	325	565	ton	2005
22	Northern Stone, Oakley, ID	Peninsula Building Materials	Sunnyvale CA	CA	Gold, Silver, 3/4 -in	Flagstone	275	395	ton	2005
23	Northern Stone, Oakley, ID	Peninsula Building Materials	Sunnyvale CA	CA	Gold, Silver, 3/4 -in	Flagstone	325	465	ton	2005
37	Northern Stone, Oakley, ID	Canby Landscape	Canby OR	OR	Sunset Gold, 3/4 in veneer	Flagstone	225	450	ton	2005
43	Northern Stone, Oakley, ID	Basalite	Sparks, NV	NV	Gold, Silver, 3/4 -in	Flagstone	325	450	ton	2005
46	Northern Stone, Oakley, ID	Basalite	Sparks, NV	NV	Gold, Silver, 3/4 to 1-1/4 -in	Flagstone	225	310	ton	2005
48	Northern Stone, Oakley, ID	Western Concrete	Cadillac, MI	MI	Sunset gold	Flagstone	225	500	ton	2005
49	Northern Stone, Oakley, ID	Western Concrete	Cadillac, MI	MI	Gold and Silver	Flagstone	275	400	ton	2005
51	Northern Stone, Oakley, ID	Am Rock ReadiMix	Salinas, CA	CA	Sunset gold and silver flagstone	Flagstone	275	400	ton	2005
53	Northern Stone, Oakley, ID	Brennings Rock	Citrus Heights, CA	CA	Sunset gold	Flagstone	225	380	ton	2005
55	Northern Stone, Turquoise quarry	MBI ReadiMix	Colfax CA	CA	Sunset bronze 2 in select	Flagstone	150	450	ton	2005
56	Northern Stone, Oakley, ID	MBI ReadiMix	Colfax CA	CA	Gold and Silver, 1-1/2 to 2 in	Flagstone	225	400	ton	2005
59	Northern Stone, Oakley, ID	Sturgis Materials	Kansas City, KS	KS	Rocky Mtn quartzite, white, gold, 1/2 in	Flagstone	325	825	ton	2005
60	Northern Stone, Oakley, ID	Sturgis Materials	Kansas City, KS	KS	Rocky Mtn quartzite, white, gold, 1 in	Flagstone	225	500	ton	2005
61	Rock Works, Challis, ID	Rocky Mtn Supply	Idaho Falls ID	ID	Ramshorn	Flagstone	210	350	ton	2005
63	Northern Stone, Oakley, ID	Rocky Mtn Supply	Idaho Falls ID	ID	Oakley standup	Flagstone	225	375	ton	2005
64	Northern Stone, Oakley, ID	Rocky Mtn Supply	Idaho Falls ID	ID	Desert Antique	Flagstone	175	200	ton	2005
66	Northern Stone, Oakley, ID	Squires Brick	Idaho Falls ID	ID	Oakley 3/4-1-1/4 in	Flagstone	225	366	ton	2005
67	Northern Stone, Oakley, ID	Squires Brick	Idaho Falls ID	ID	Oakley 3/8-3/4 in	Flagstone	325	530	ton	2005
68	Northern Stone, Oakley, ID	Smitty's Fireplace	Helena, MT	MT	Gold and silver, 1/4-3/4 in	Flagstone	325	420	ton	2005
69	Northern Stone, Oakley, ID	Smitty's Fireplace	Helena, MT	MT	Gold and Silver, 1-1/2 to 2 in	Flagstone	225	310	ton	2005
70	Yavapai Schist	Apache Stone	Phoenix, AZ	AZ	Yavapai Schist, schist flagstone	Flagstone	100	159	ton	2005
71	Yavapai Schist	Apache Stone	Phoenix, AZ	AZ	Yavapai Schist, flagstone, thin or strip	Flagstone	100	294	ton	2005
72	State Stone	State Stone	Salt Lake City, UT	UT	Moenkopi (Torrey, UT), Flagstone and blo	Flagstone	175	350	ton	2005

Appendix 3e - Retail and wholesale selling price for stone

NO	Wholesaler	Retailer	Retailer address	State	StoneDesc.	Type_Rock	Wholesale	Retail	Unit	Date
73	Yavapai Schist	Triple R Stone re: Apache Stone		AZ	Yavapai Schist, flagstone, 4 inch veneer	Flagstone	100	159	ton	2005
75	Yavapai Schist	Triple R Stone re: Apache Stone		AZ	Yavapai Schist, flagstone, 4 inch strip	Flagstone	100	159	ton	2005
77	Yavapai Schist	Triple R Stone re: Apache Stone		AZ	Yavapai Schist, 2 inch veneer	Flagstone	150	294	ton	2005
78	Yavapai Schist	Triple R Stone re: Apache Stone		AZ	Yavapai Schist, flagstone, 2 inch thin or st	Flagstone	150	294	ton	2005
79	Good Springs quarry	Vegas Rock	Henderson, NV	NV	Blanco flagstone	Flagstone	175	250	ton	2005
80	Good Springs quarry	Vegas Rock	Henderson, NV	NV	Blanco flagstone	Flagstone	175	350	ton	2005
81	Good Springs quarry	Vegas Rock	Henderson, NV	NV	Gold patio flagstone	Flagstone	175	800	ton	2005
83	Good Springs quarry	Vegas Rock	Henderson, NV	NV	Pink patio flagstone	Flagstone	175	200	ton	2005
84	Good Springs quarry	Vegas Rock	Henderson, NV	NV	Pink patio flagstone	Flagstone	175	350	ton	2005
87	Good Springs quarry	Vegas Rock	Henderson, NV	NV	Rainbow gold ashlar	Flagstone	175	200	ton	2005
88	Good Springs quarry	Vegas Rock	Henderson, NV	NV	Rainbow gold ashlar	Flagstone	175	350	ton	2005
89	Good Springs quarry	Vegas Rock	Henderson, NV	NV	Rainbow graded flagstone	Flagstone	175	350	ton	2005
90	Good Springs quarry	Vegas Rock	Henderson, NV	NV	Rainbow graded flagstone	Flagstone	175	200	ton	2005
8	Northern Stone, Oakley, ID	Oakhurst Rocks	Oakhurst CA	CA	Honey Ledge	Ledge, ashlar	190	220	ton	2005
9	Northern Stone, Turquoise quarry	Oakhurst Rocks	Oakhurst CA	CA	Ledge	Ledge	155	400	ton	2005
11	Northern Stone, Oakley, ID	Rustic Brick	Sacramento, CA	CA	Honey Ledge	Ledge	190	350	ton	2005
16	Northern Stone, Oakley, ID	Thompson Bldg Materials	Fontana CA	CA	Honey Ledge	Ledge	190	280	ton	2005
18	Northern Stone, Turquoise quarry	Sanford Stone	Atascadero CA	CA	Turquoise landscape	Ledge	115	200	ton	2005
24	Northern Stone, Turquoise quarry	Resource Bldg Matls.	Downey CA	CA	White Cloud 4 in	Ledge	120	430	ton	2005
26	Northern Stone, Turquoise quarry	KRC Rock	San Marcos CA	CA	Rubble, 3-5 in	Ledge	120	455	ton	2005
29	Northern Stone, Turquoise quarry	Bouget Bros	Santa Monica CA	CA	Turquoise Ledge	Ledge	135	260	ton	2005
32	Northern Stone, Turquoise quarry	Apache Stone	Phoenix AZ	AZ	Turquoise, ledge	Ledge	120	314	ton	2005
34	Northern Stone, Turquoise quarry	Canby Landscape	Canby OR	OR	Turquoise, ledge	Ledge	120	325	ton	2005
35	Northern Stone, Turquoise quarry	Canby Landscape	Canby OR	OR	White Cloud, Golden Cloud, Turquoise, le	Ledge	90	295	ton	2005
39	Northern Stone, Turquoise quarry	Pacific Stonescape	Eugene OR	OR	Turquoise, rubble, 1/8 in	Ledge	90	250	ton	2005
40	Northern Stone, Turquoise quarry	Pacific Stonescape	Eugene OR	OR	Flagstone, veneer	Ledge	135	325	ton	2005
41	Northern Stone, Turquoise quarry	Pacific Stonescape	Eugene OR	OR	White Cloud	Ledge	125	265	ton	2005
42	Northern Stone, Oakley, ID	Basalite	Sparks, NV	NV	Honey Ledge	Ledge	190	285	ton	2005
44	Northern Stone, Oakley, ID	Basalite	Sparks, NV	NV	Desert Antique 2-4 in	Ledge	175	320	ton	2005
45	Northern Stone, Oakley, ID	Basalite	Sparks, NV	NV	Desert Antique 1-2 in	Ledge	250	330	ton	2005
47	Northern Stone, Turquoise quarry	Ruck Bros Brick	Ft Myers, FL	FL	Turquoise	Ledge	135	530	ton	2005
50	Northern Stone, Turquoise quarry	Am Rock ReadiMix	Salinas, CA	CA	Turquoise rubble	Ledge	125	325	ton	2005
52	Northern Stone, Turquoise quarry	Brennings Rock	Citrus Heights, CA	CA	Turquoise rubble	Ledge	135	480	ton	2005
54	Northern Stone, Oakley, ID	Brennings Rock	Citrus Heights, CA	CA	Honey Ledge	Ledge	190	320	ton	2005
58	Northern Stone, Turquoise quarry	Sturgis Materials	Kansas City, KS	KS	Golden cloud, white cloud	Ledge	90	430	ton	2005
62	Northern Stone, Oakley, ID	Rocky Mtn Supply	Idaho Falls ID	ID	Oakley ledge	Ledge	190	225	ton	2005
65	Northern Stone, Oakley, ID	Squires Brick	Idaho Falls ID	ID	Oakley ledge	Ledge	190	223	ton	2005
74	Yavapai Schist	Triple R Stone re: Apache Stone		AZ	Yavapai Schist, 4 inch veneer	Ledge	100	159	ton	2005
76	Yavapai Schist	Triple R Stone re: Apache Stone		AZ	Yavapai Schist, 4 inch strip	Ledge	100	159	ton	2005
82	Good Springs quarry	Vegas Rock	Henderson, NV	NV	Pink ashlar	Ledge	175	225	ton	2005
85	Good Springs quarry	Vegas Rock	Henderson, NV	NV	Rainbow ashlar	Ledge	175	300	ton	2005
86	Good Springs quarry	Vegas Rock	Henderson, NV	NV	Rainbow gold ashlar	Ledge	175	225	ton	2005

UTAH GEOLOGICAL SURVEY
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Plate 1
Open-File Report 521
Building Stone Quarries and Yards, Utah and Parts of Arizona, Idaho, Montana, Washington, and Wyoming

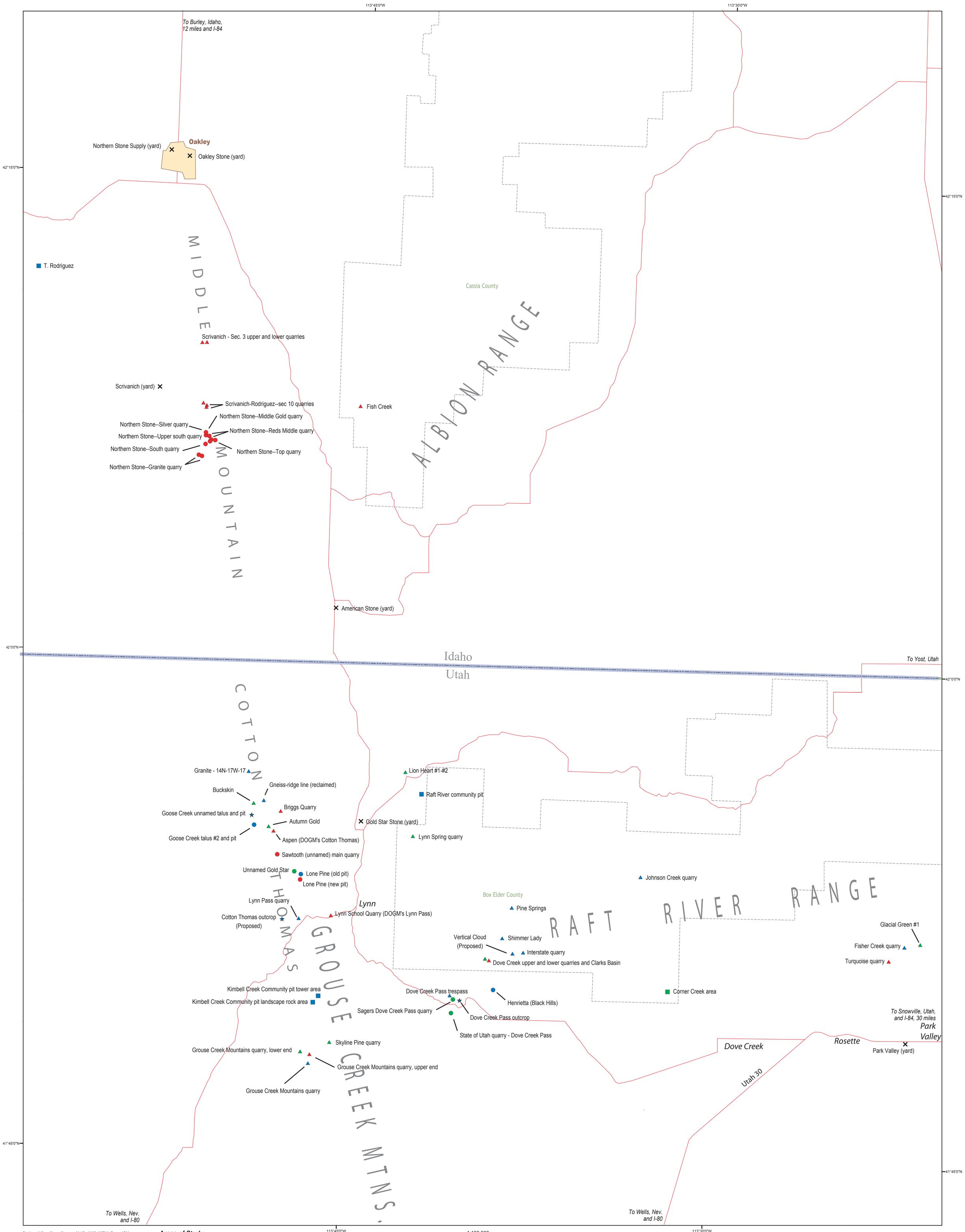
Map Showing Building Stone Quarries and Stone Yards, Arizona, Southern Idaho, Utah, and Wyoming

by
David E. Boleneus

2008

UTAH GEOLOGICAL SURVEY
a divison of
Utah Department of Natural Resources

Plate 2
Open-File Report 521
Building Stone Quarries and Yards, Utah
and Parts of Arizona, Idaho, Montana, Washington, and Wyoming



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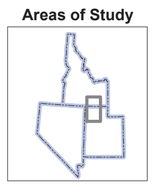
Geographic Coordinate System: GCS_North_American_1983
Datum: D_North_American_1983
Prime Meridian: 0
Angular Unit: Degree

Areas of Study



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0 2.5 5 Miles

0 4.5 9 Kilometers

Map Showing Building Stone Quarries and Stone Yards, Northwest Utah and Southern Idaho

by

David E. Boleneus

2008

EXPLANATION

Stone Quarries (Size, Type, and Ownership):

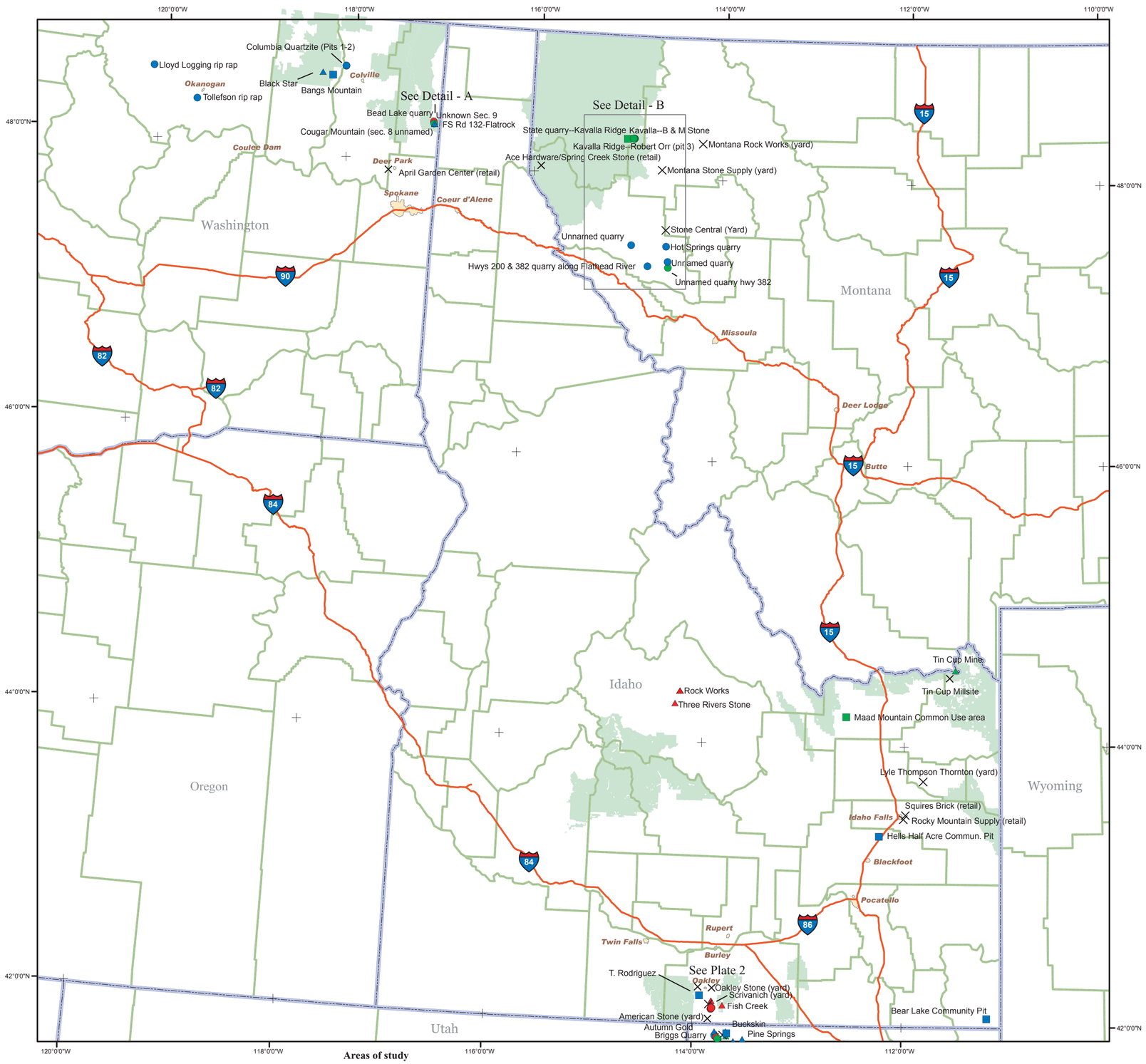
Material Site, Community Pit, or Common Use area:	*Mining claim:*	*Private or state lands:*	*Unknown:*
Large	Large	Large	Large
Medium	Medium	Medium	Medium
Small	Small	Small	Small

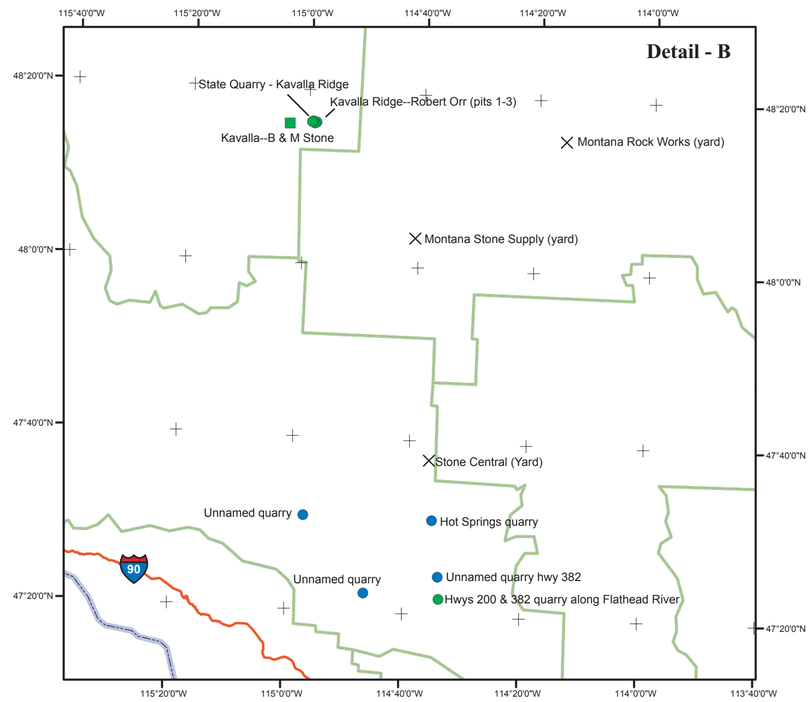
State boundary
National Forest boundary
Sampling point
Yard

UTAH GEOLOGICAL SURVEY
a divison of
Utah Department of Natural Resources

Plate 1
Open-File Report 521

Building Stone Quarries and Yards, Utah and Parts of Arizona, Idaho, Montana, Washington, and Wyoming





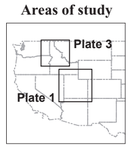
EXPLANATION

State boundary
County boundary
Sampling point
Yard
National Forest boundary (all NFs are not shown)

Stone Quarries (Size, Type, and Ownership):

Material Site, Community Pit, or Common Use area:	*Mining claim:*	*Private or state lands:*	*Unknown:*
Large	Large	Large	Large
Medium	Medium	Medium	Medium
Small	Small	Small	Small

Areas of study



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Latitude_Of_Origin: 0.00000000
Linear Unit: Meter

Geographic Coordinate System: GCS_North_American_1983
Datum: D_North_American_1983
Prime Meridian: 0
Angular Unit: Degree

Map Showing Building Stone Quarries and Stone Yards, Montana, Idaho, and Washington

by
David E. Boleneus

2008