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# The Economic Impacts of Placer Mining in Alaska



Prepared for  
  
ALASKA MINERS  
ASSOCIATION  
Prepared by  
 **McDowell**  
GROUP

# *The Economic Impacts of Placer Mining in Alaska*

*Prepared for:*  
**Alaska Miners Association**

*Prepared by:*



*Juneau • Anchorage*

*October 2014*

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# Executive Summary

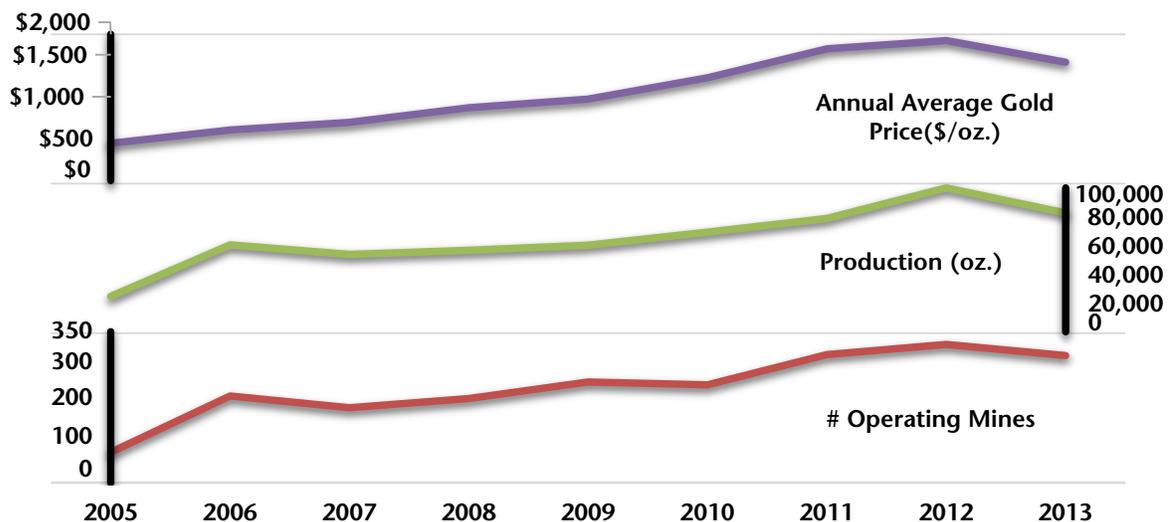
The Alaska Miners Association contracted with McDowell Group to study the economic impacts of placer mining in Alaska. While the economic impact of Alaska's hard-rock mining industry is routinely measured and well-understood, gaining a full understanding of the economic impact of placer mining in Alaska requires special research and analysis. To gather data on Alaska's placer mining industry employment and spending activity, McDowell Group conducted a survey of permitted placer mines in Alaska. A total of 182 mine operators participated in the survey, providing data on employment, wages, spending on goods and services, and other information.

Alaska has a rich history of placer mining dating back to the late 1800s. While placer mine production in Alaska today may be small relative to the industry's early days, it remains a significant contributor to the state's economy. Following are key findings of this study.

## Placer Mining Production

- There were 646 placer mines permitted by the Alaska Department of Natural Resources (DNR) in 2013. DNR estimated 47 percent of permits (295 placer operations) were mined in 2013.
- In 2013, estimated placer mine gold production was 82,600 ounces, with a total gross production value of approximately \$105 million.
- There is a strong link between the number of operating placer mines, placer production, and gold prices. To illustrate, from a 2005 price of \$450 per ounce, prices rose steadily to an all-time high of nearly \$1,900 in August 2011. Following the same trend, the number of producing placer mines climbed from 71 in 2005 to a recent peak of 321, with production at a nine-year high of 100,041 ounces in 2012.

## Estimated Alaska Placer Operations, Production, and Annual Average Gold Prices, 2005 – 2013



Source: DNR (DGGs) and DCCED estimates. Kitco London Fix annual average price.

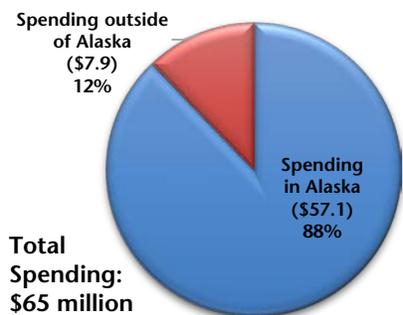
## Employment and Labor Income

- In 2013, there were approximately 1,200 direct, mostly seasonal, jobs in Alaska’s placer mine industry.
- On average, each placer mine had four workers. However, approximately 27 percent of placer mines were run by one person and there are a few significant larger operations (50+ workers).
- Of the 1,200 workers, approximately 73 percent (880 workers) live in Alaska. Of those Alaska residents, approximately half live in Anchorage/Mat-Su Borough (26 percent) or Fairbanks (26 percent). The remaining half (48 percent) live in communities elsewhere in Alaska.
- Total direct income, including wages, shares of production, and owner’s profits, are estimated at \$40 million for 2013.
- For miners receiving compensation, 56 percent were paid a wage, while the remaining 44 percent were compensated with a share of gold production.

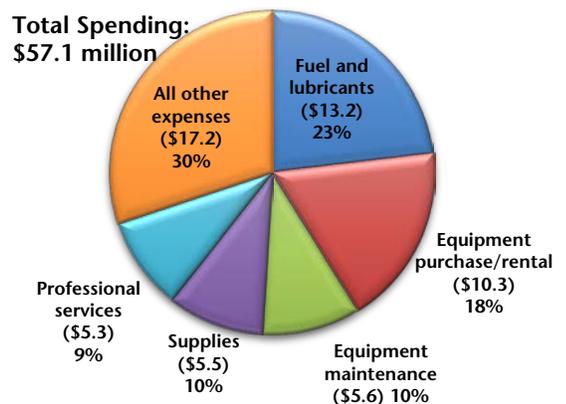
## Spending on Goods and Services

- Placer miners spent approximately \$65 million on goods and services for their operation in 2013. Of that spending, 88 percent (or \$57.1 million) was spent in Alaska.
- The most significant categories of spending were for fuel and lubricants (\$13.2 million) and equipment purchases and rentals (\$10.3 million). All other categories of spending including, equipment maintenance, supplies, professional services and other expenditures have a combined total of \$33.6 million.
- In 2013, Fairbanks received the highest level of goods and services spending from placer miners at \$32.4 million, followed by Anchorage (\$16.2 million). The remaining \$8.5 million in-state spending was spent elsewhere in Alaska, much of which supported small rural economies.

**Estimated Alaska Placer Mining Goods and Services Spending, in \$millions, 2013**



**Estimated Alaska Placer Mining Goods and Services Spending in Alaska, in \$millions, 2013**



Source: McDowell Group Placer Miner Survey, 2014 and McDowell Group estimates.

## Total Statewide Impacts

- Including the multiplier impacts (indirect and induced), placer mining-related employment statewide totaled 1,700 jobs with a total statewide labor income of \$65 million.
- The total placer mining-related employment impact was 450 jobs in Fairbanks, and 370 jobs in Anchorage/Mat-Su, and an additional 600 placer mining-related jobs for Alaska residents elsewhere in the state. The remaining 320 jobs in Alaska were held by nonresidents.

- Approximately \$19 million in total labor income impacts were in the Fairbanks economy, \$15 million in Anchorage/Mat-Su, and \$23 million elsewhere in Alaska.
- The total impact of spending on goods and services as a result of Alaska’s placer mining industry activity (including all multiplier effects) was \$150 million. This is a measure of all spending directly or indirectly connected with Alaska’s placer mining industry.

## Government Payments

- While, mining industry payments to the State specific to placer miners activity were not determined, the placer mining sector creates revenue to the State of Alaska through a number of mechanisms, including royalty payments, taxes (for example, mining license tax, corporate net income tax, and state fuels tax), annual claim rental, annual labor, and other mining fees (including Application for Permits to Mine in Alaska (APMA) and reclamation bonds). Payments are also made to various state and local government departments for programs, fees, and services.
- Purchases of goods and services within Alaska also generate additional tax revenue through sales taxes (where levied) and property taxes.

### Summary of Placer Mining-Related Economic Impacts, 2013

Economic Activity	Impacts
<b>Direct Impacts</b>	
Number of permitted placer mine operations	646
Number of active placer mine operations	295
Estimated ounces produced	82,591
Estimated value of placer mine production (value of sales excluding commissions)	\$105 million
Number of jobs statewide	1,200
Number of workers who are Alaska residents	880
Estimated labor income	\$40 million
Spending on goods and services in Alaska	\$57 million
Percent of total mine operations spending with Alaska-based vendors	88%
Number of jobs in Fairbanks	230
Number of jobs in Anchorage/Mat-Su Borough	230
Number of jobs elsewhere in Alaska	420
Number of jobs held by nonresidents	320
<b>Total Impacts (direct, indirect, and induced)</b>	
Total jobs in Alaska	1,700 jobs
Total labor income in Alaska	\$65 million
Total spending on goods and services in Alaska	\$150 million
<b>Other Economic Impacts</b>	
Average number of employees per placer mine operation	4.1
Estimated number of family members employed	155

Source: DNR, McDowell Group Placer Mine Survey, 2014, and McDowell Group estimates.

# Introduction

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Placer mining is a unique segment of Alaska’s mining industry. This form of mining has a rich history in Alaska, and the image of a goldpanner is iconic in Alaska’s culture. Placer mining occurs in all corners of Alaska and ranges from small family affairs to larger corporate undertakings. With recent reality television shows about mining in Alaska, along with favorable gold prices, placer mining has seen a resurgence. Yet little has been understood about the economic impact of this form of mining. The last study of placer mining in Alaska, *The Role of Placer Mining in the Alaska Economy*, was conducted for the State of Alaska Department of Commerce and Economic Development (DCCED) Office of Mineral Development almost 30 years ago in 1985. In an effort to understand the current impact of placer mining on Alaska’s economy, the Alaska Miners Association (AMA) contracted with McDowell Group, an Alaska research and consulting firm, to conduct a study of the economic impact of placer mining in Alaska.

The study team compiled information from government agencies involved with permitting and monitoring placer mining activity and their payments to the State of Alaska (royalties, taxes, and fees), as well as gathered data directly from placer miners through a mail survey. The placer survey captured employment and spending information for the 2013 season. Depending on the operation, employment impacts include the owner, partners, family members, and employees who may receive a wage, a percent of production share earnings, or may receive little to no compensation. Spending impacts include labor income, including payroll to employees, profit payments to owners, and expenditures for supplies and services to operate the placer mine (such as equipment, groceries, fuel, transportation, and other services). This information was then extrapolated and used to model the direct economic impacts, as well as the multiplier effect (indirect and induced impacts) of placer mining in Alaska.

There were several methods and tools used in preparation of this study. A survey of Alaska placer miners provided a broad range of information about spending and employment. A variety of other data sources were used to measure placer mining activity in the state. These and other sources are described in more detail, below.

## Survey of Placer Miners

For the purpose of conducting a survey of placer mines in Alaska, Alaska Department of Natural Resources (DNR) Division of Land, Mining, and Waters provided McDowell Group with a current list of mine owners, operators and lessees who had filed an Application for Permits to Mine in Alaska (APMA) administered by the Division. The list contained just over 2,000 entries, including hard-rock mine permit holders. Hard-rock permit holders were removed from the list. Duplicate names were removed. For purposes of the survey the operator contact information was retained as they were most likely to be familiar with the day-to-day operations of the mine. The final mailing list contained 654 placer mine operation (active and inactive) contacts. Individuals or companies with multiple APMA's received more than one survey and were asked to provide information for each mine they operated.

The list contained additional information for each operation, including the type of activity permitted. 10 percent of the permits were for exploration, about one-third were for suction-dredging, and the remaining permits were for other types of mining activity, including reclamation.

The survey was designed in consultation with Alaska Miners Association, using the 1985 survey content as a starting point. Survey content was designed to capture information about active status, type of mining methods used, number of days of operation, number of employees, family employment, employee residence, and mine-related expenditures for supplies and services. Data from this survey was used to model various aspects of the placer mine industry and is sourced when used in the analysis.

The survey also provided an opportunity for placer miners to comment on issues affecting their mining operations. A total of 16 pages of comments were compiled and sorted by theme. They were provided to Alaska Miners Association under a separate cover.

A pre-mailer postcard was sent to all operators on the list, informing them to watch for the survey. The survey was then mailed a couple days later to all placer operations. A second survey was sent several weeks later to nonrespondents in an effort to boost response rates. The survey was mailed in May 2014. As this is a busy time of year for most placer miners, responses were accepted until September 2014.

## Survey Respondent Data

A total of 182 individuals or companies returned surveys for a response rate of 28 percent. Survey responses represented 200 permits. Based on DNR's estimate of 295 active permits in 2013, survey results represent about 68 percent of all active permits.

## BY MINING DISTRICT

Completed surveys were received for permitted mines in 33 of 43 mining districts. According to DNR records, 27 districts had no active placer activity in 2013. The survey response was relatively representative of the actual distribution of placer mines in Alaska, with a slightly lower response rate from Nome-area permits, and slightly higher from Fortymile-area permits. The districts with the most survey responses are Nome, Fortymile, Circle, Fairbanks, and Koyukuk.

### Alaska Placer Miner Survey Responses, by Mining District, 2013

District	Surveys Responses	% of Total Responses	Permits Issued	% of Total Permits
Nome	35	19%	180	28%
Fortymile	34	19	71	11
Circle	18	10	65	10
Fairbanks	13	7	60	9
Koyukuk	12	7	49	7
Hot Springs	7	4	21	3
Yentna	7	4	31	5
Bonnifield	4	2	16	2
Chistochina	4	2	6	1
Hope	4	2	7	1
Valdez Creek	4	2	19	3
Willow Creek	4	2	7	1
Aniak	3	2	6	1
Kougarok	3	2	7	1
Ruby	3	2	8	1
Tolovana	3	2	9	1
<b>Districts with two surveys returned</b>				
Delta River, Eagle, Goodnews Bay, Homer, Juneau, Koyuk, Nelchina	14	8	37	6
<b>Districts with one survey returned</b>				
Anchorage, Chisana, Hughes, Iditarod, Innoko, Kodiak, Prince William Sound, Rampart, Seward, Tok	10	5	37	6
<b>Districts with no surveys returned</b>			10	2
<b>Total surveys returned</b>	<b>182</b>	<b>100%</b>	<b>646</b>	<b>100%</b>

Due to rounding, column may not added to 100 percent.

Source: DNR Division of Land, Mining, and Waters, and McDowell Group Placer Mine Survey, 2014.

## BY STATUS OF MINING OPERATION

Of the placer responses, 14 percent indicated their operation was inactive in 2013. Several operations indicated multiple mining phases, such as concurrent exploration and reclamation work. Most operators were actively exploring or developing their mine (58 percent); 38 percent were producing, and 25 percent were in the reclamation phase. A few operations were also engaged in other activities, such as permitting, care and maintenance, or preparation of baseline studies.

## Alaska Placer Mine Survey Responses, by Current Status of Mining Operation, 2013 (Multiple responses accepted)

	Number of Responses (n=182)	% of Total
Exploration/development	106	58%
Production	69	38
Reclamation	45	25
Inactive	25	14
Other (including care and maintenance, baseline studies)	3	2

Source: McDowell Group Placer Mine Survey, 2014.

### BY MINING METHOD

Mechanical methods (primarily heavy equipment) were used by most of the placer miners (60 percent), followed by suction dredging (33 percent). Far fewer placers used other methods, including moving material by hand (4 percent), using hydraulic water pressure to move material (1 percent), underground (or drift) mining (1 percent) or other means (1 percent). Some placer miners used multiple methods.

### Alaska Placer Mine Survey Responses, by Mining Methods, 2013

	Number of Responses (n=153)	% of Total
Mechanical (bulldozer, loader, etc.)	92	60%
Suction Dredging	50	33
Hand mining	6	4
Hydraulic (high pressure water only)	2	1
Drifting (underground mining)	1	1
Other (including off-shore barge excavator)	2	1

Source: McDowell Group Placer Mine Survey, 2014.

## Other Data Sources

Several sources of data and information was compiled through executive interviews, published data and special data requests made to the Alaska DNR Division of Mining, Land, and Water, DNR Division of Geological and Geophysical Surveys, Alaska Department of Commerce, Community and Economic Development (DCCED), and Alaska Department of Labor and Workforce Development (DOLWD), and Alaska Department of Revenue (DOR).

## Economic Impact Modelling

The multiplier effects of the placer mine industry in Alaska were estimated using IMPLAN, a predictive input-output model of local and state economies widely used to measure the economic impact of industrial and commercial activity.<sup>1</sup> The model uses borough-level and statewide employment and other data to define links between industries in the local economy and multipliers that predict the total impact of an economic activity.

<sup>1</sup> IMPLAN Group LLC, 2012 dataset. <http://www.implan.com>

# Overview of Placer Mining in Alaska

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## What is Placer Mining?

Placer mining is the mining of alluvial deposits (material carried by water or erosion) for precious minerals, most often gold but also platinum or other heavy metals or gems. These minerals were at one time contained in bedrock but over time eroded by natural forces from the rock and deposited with other sedimentary materials, primarily sand and gravel. Gold is much heavier than the surrounding matrix and once freed from rock by erosion will migrate through lighter material. Over time, these precious minerals naturally concentrate by water and gravity in



“pay-streaks” (often in ancient stream beds). To mine these pay-streaks, overburden must be removed, the gold-bearing material extracted and then run through a wash plant to produce a gold-bearing concentrate.

As described below, a variety of methods are used to extract gold bearing material and recover the contained gold. Recovered gold can range from fine flakes to large nuggets.

## Extraction Methods

- **Heavy Equipment** – Many placer mines in Alaska use bulldozers, loaders, excavators and other heavy equipment to remove the overburden and access the pay streak.
- **Suction dredge** – In-stream dredging uses a suction hose to pull out material that has settled to the bottom of water bodies. A suction dredge is akin to a vacuum cleaner used underwater and sucks up the streambed (or ocean bed) material. A dredge is most often handled by a diver. The material passes through a suction hose to a surface concentrating system.
- **Underground drift mining** – In some areas where the deposit is buried too deep for surface access, or particularly in areas of permafrost, placer deposits are mined underground. Steam is used to thaw the frozen ground (and sometimes explosives) to gain access to pay-streaks.

## Gold Recovery Methods

- **Sluice box/high banker** – A sluice box is an integral part of a placer mining operation. Gold-bearing material is feed by hand or with heavy equipment into a hopper at the top end of the sluice box. The material is screened then carried through the sluice box by water, washing away the lighter materials and concentrating the heavier gold-bearing material behind riffles and in mesh screens and mats. Sluice boxes range in size from hand-portable to large pieces of equipment used in conjunction with screening plants or trommels. Larger scale operations use excavators or loaders to feed the sluice box. When the sluice is cleaned out, the gold bearing material trapped in the mesh or mats is then panned by hand or mechanical means.A person wearing a red cap and dark clothing is operating a sluice box in a stream. The sluice box is a long, narrow channel with a hopper at the top and a riffled section. Water is flowing through the sluice box, and the person is using a tool to manage the material. The stream is surrounded by rocks and vegetation.
- **Trommel/screen** – A trommel is a slightly-inclined rotating metal cylinder with a sluice box at the lower (discharge) end. The trommel rinses and sorts out material too large to feed into the sluice box. Trommels can range in size from portable one-man operations to large stationary pieces of equipment more than 30 feet in length. Vibrating screens are used to perform the same function as a trommel; washing and sorting material too large for the sluice box.
- **Panning** – Panning is often the first step in a placer mining operation and the last step. Panning is used in the exploration phase to locate and sample gold-bearing material. Panning is also used to separate gold from other heavy material concentrate by the wash plant. Gold bearing material is placed in a large metal or plastic pan. Water is added and agitated so that the gold particles, being of higher density than the sand and gravel, settle to the bottom of the pan. The lighter material (sand, mud, gravel, etc.) is then washed away, leaving the gold behind. Miners may pan gold directly from a stream bed or from material removed by other means. Panning is often used to test samples to determine if the amount of gold in the material is worth recovering by mechanical or other means.A person wearing a camouflage cap and a dark jacket is holding a green plastic pan. The pan contains a small amount of gold concentrate. The person is smiling and looking at the camera. The background shows a stream and rocks.
- **Rocker** – A rocker box (sometimes referred to as a “cradle”) is a small-scale method that can process more volume than panning, yet it still is portable. The box is usually fed by hand and is rocked to concentrate the gold.

## History of Placer Mining in Alaska

Russian explorers began placer gold exploration and mining in Alaska in the 1800s. After Alaska became a U.S. territory, exploration and mining continued. By the 1860s and 1870s, prospectors moved north from the California gold rush. In the 1880s, the Juneau gold rush was started by the discovery of the AJ and Treadwell deposits. Significant deposits were discovered in Rampart (Yukon River drainage) in 1882, the Fortymile mining district in 1886, and the Circle district in 1893.



The Klondike gold rush of 1897-1898 in Canada attracted even more placer miners to Alaska. Nome deposits were discovered in 1898. Gold was discovered in the Fairbanks area (which would ultimately become the largest-producer) in 1902.

Soon most labor-intensive methods were abandoned for larger mechanization using large-scale cold water thawing, hydraulic stripping and excavation. Dredges were first used in Nome in 1905. The first large electric-powered dredges were used in Nome and Fairbanks in the 1920s. By the

start of World War II, Alaska had become the leading gold producing state – nearly 750,000 ounces were produced in 1940, of which most came from placer mines.

During World War II, most placer mines in Alaska stopped production under order of the federal government, as gold mining was considered nonessential to the war effort. Following the war, a fixed gold price (\$35 per ounce), coupled with inflation that was increasing mining costs, spelled the end for many gold mining operations.

When the policy of a fixed gold price ended in the early 1970s, and gold ownership restrictions on private citizens were lifted by the Federal government, several hundred placer operations in Alaska came back into production (or new production). Gold prices continued to climb. By 1982, production from about 500 placer mines had risen to 174,900 ounces worth \$70 million.

Placer mining remains strong in Alaska with gold prices ranging from \$1,200 to nearly \$1,900 an ounce over the last four years. A resurgence of suction dredge mining offshore of Nome, somewhat driven by reality television programs, has also attracted a host of new operators in that area.

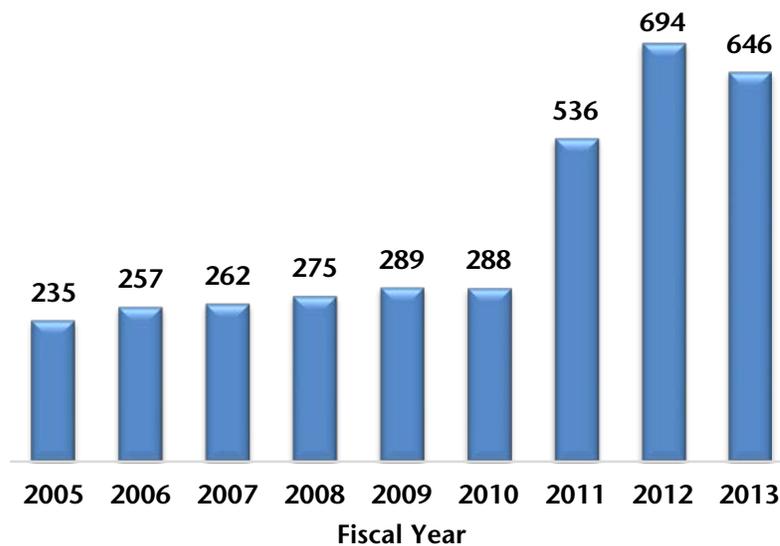
## Placer Mining Permitting

All placer mines in Alaska require some level of permitting, regardless of their size and whether the claim is on local, state, or federal government, or private lands. Permits are needed from various agencies, including Alaska Department of Natural Resources, Bureau of Land Management (BLM), US Army Corp of Engineers, Alaska Department of Fish and Game, and the U.S. Environmental Protection Agency (EPA). A significant level of annual reporting is required by all agencies for operators to keep their permits current. Agencies make regular inspections at mine operations to ensure compliance with rules and regulations.

All placer mining operations in Alaska require an Application for Permits to Mine in Alaska (APMA) with the exception of recreational mining using suction dredges with hoses less than six inches in diameter. With the recent surge of mining activity on the Nome area, as of 2012, all suction dredge operations in that area, regardless of hose diameter, are required to file an APMA.

The number of permitted placer mines in Alaska ranged from a low of 235 to a high of 694 between fiscal year (FY) 2005 and FY2013. Not surprisingly, the number of permits roughly tracks the price of gold. Not all permitted mines operate every year. Based on APMA records, from FY2011 to FY2013, about half of permitted mines were active.

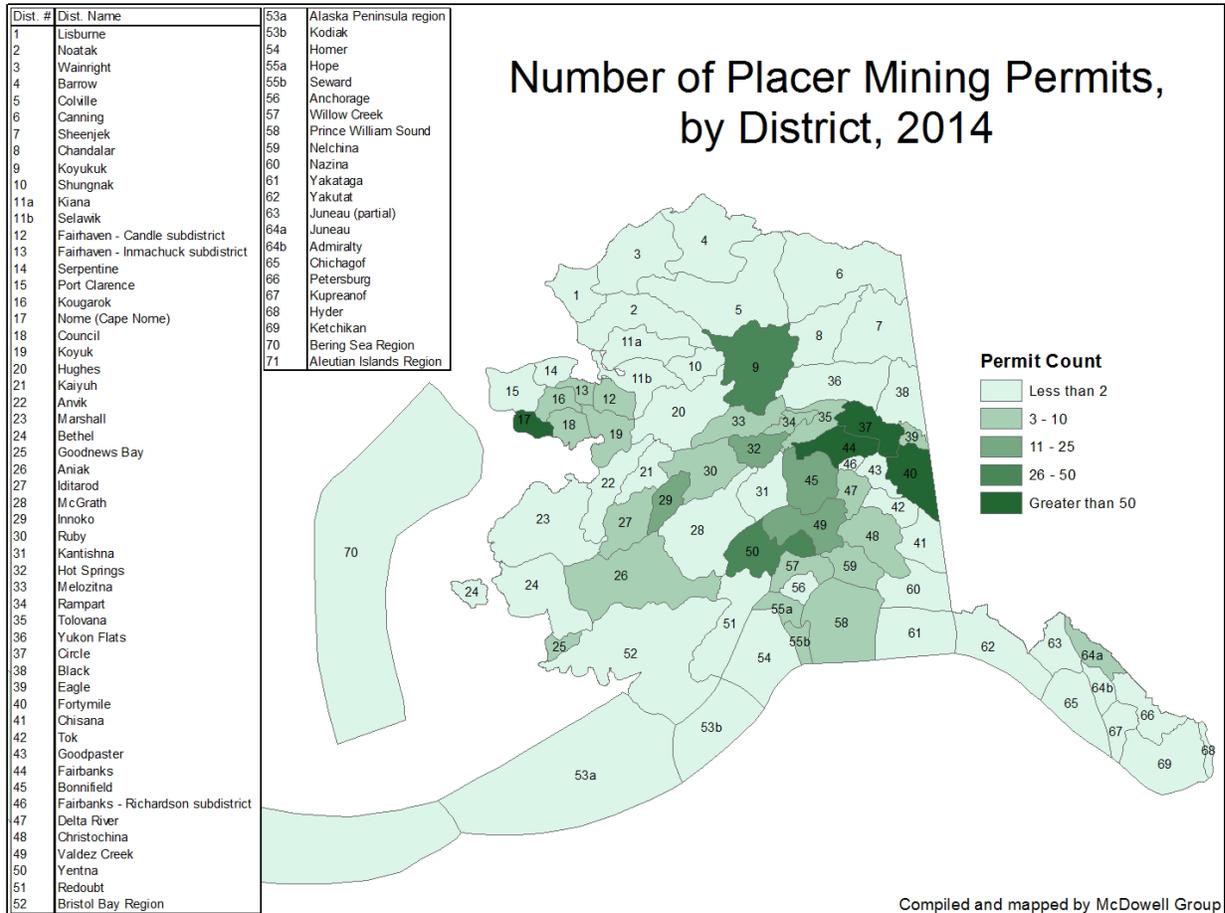
**Number of Placer Mining Permits Issued in Alaska, FY2005-FY2013**



Includes placer mines on public and private lands.  
Source: DNR, Division of Land, Mining, and Waters.

## Location of Placer Mine Permits

The map below illustrates how placer mining permits are distributed throughout the state in 2014. The regions with the most permits issued include Fortymile, Fairbanks, Circle, and Nome.



## Placer Production Trends

Alaska placer mine production ranged between approximately 25,000 ounces in 2005 and 100,000 ounces in 2012. Over this same period, the number of operating mines has fluctuated between 71 (2005) to a high of 321 mines (2012). The number of operating mines remained around 300 between 2010 and 2013. The effects of high gold prices on placer activity is most noticeable in 2011 and 2012 when gold prices reached record highs (*see table below*). In 2013, estimated production from 295 active mines is recorded at 82,591 ounces.

## Estimated Alaska Placer Mining Production, 2005 – 2013

Year	# of Operating Mines	Ounces Produced	Average. Annual Gold Price per Ounce
2005	71	24,605	\$445
2006	201	60,382	603
2007	174	53,849	695
2008	195	56,759	872
2009	234	60,250	972
2010	227	69,318	1,225
2011	297	78,717	1,572
2012	321	100,041	1,669
2013*	295	82,591	1,411

\*Preliminary estimates.

Source: DNR (DGGs) and DCCED estimates. Kitco London Fix annual average price.

While Alaska gold production was valued at approximately \$116 million, Alaska’s placer miners earned an estimated \$105 million from their gold sales in 2013. Placer miners sell gold for a price somewhat less than gold’s global market price, as they typically pay a commission to the buyer. These commissions typically range from 10 to 15 percent.

## Recreational Mining

Another sub-set of placer mining is “recreational mining.” Recreational mining is defined as amateur, casual, short-term mining for placer gold using non-mechanized equipment, such as a gold pan or a small portable sluice box, rocker-box; small suction dredges, and/or metal detectors. Recreational mining may be conducted on private or public properties. Some permitted mine operators choose to operate a small-scale, casual, or occasional recreational basis. Other recreational miners pay some type of a fee to work gold bearing ground on a permittee’s land.



There are also designated areas for recreational mining on state and federal lands. Recreational mining opportunities have expanded statewide in concert with recent high gold prices.

Recreational mining operations range from gold-panning activities attracting several thousand tourists spending \$15-\$20 each and a few hours to find some gold flakes (often seeded in the paydirt) to operations where a few hundred people spend as much as a couple thousand dollars per week (including equipment, room and board). Operations that cater to miners staying from a few days to a few weeks are very similar to other visitor destinations such as lodges or bed and breakfast in the state that offer sportfishing, wildlife viewing etc. and have the same positive economic impacts. One enterprising mine operation is selling, among other mining related items such as gold pans, one pound bags of "Pay Dirt" that have been seeded with gold for \$5.80 per bag plus shipping.

Based upon interviews with recreational mine operators in 2012, at least 800 people traveled to Alaska to primarily participate in recreational mining, amounting to at least 1,000 miner-weeks of annual recreational mining at the remote pay-to-mine camps. Several thousand miner-weeks are also estimated to occur at highway accessible sites near Anchorage and Fairbanks. No attempt has been made to estimate the number of recreational miners visiting federal and state designated gold panning areas, but it is likely to exceed the number visiting commercial sites. Though no specific data is available, the total economic impact of recreational mining in Alaska likely exceeds several million dollars, including payments to private owners and spending on transportation, accommodations, food, services and supplies. <sup>2</sup>

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<sup>2</sup> Partial excerpt from *The Economic Impacts of Alaska's Mining Industry*, McDowell Group, 2012. Measuring the economic impact of recreational mining in Alaska is beyond the scope of this placer mining impact study.

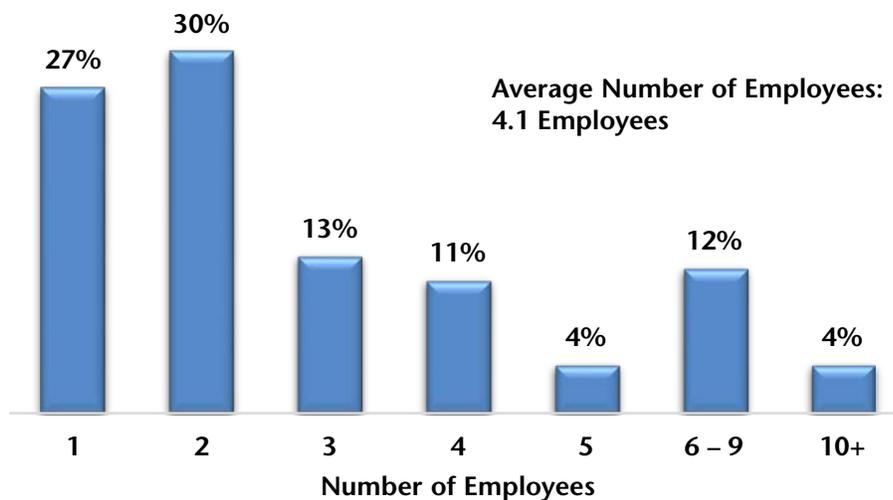
# Economic Impacts of Placer Mining

## Employment

Placer mines in Alaska operate under a variety of employment models, ranging from a single owner/operator, to family operations, to larger operations with paid employees (with compensation either by wage or shares dependent on the operation's production value).

Most placer mines are relatively small operations when measured in terms of employment. Survey results indicate 27 percent of placer permits were only worked by the permit holder with no additional employees. Operations with two workers made up 30 percent of all active placer operations. Approximately 44 percent of placer operations had three or more workers. The largest operation responding to the survey employed more than 50 workers. On average, 4.1 workers worked on active placer operations in 2013.

**Alaska Placer Mine Employment, by Size of Operation, 2013**



\*Includes all individuals working on a placer operation, including the owner, operator, family members or employees.

Source: McDowell Group Placer Miner Survey, 2014.

Based on DCCED's estimate of 295 active mines in 2013 and average employment of 4.1 workers per mine, an estimated 1,200 workers (including mine operators, family members, and employees) are in Alaska's placer industry.

Mines with wage employees operated an average of 86 days in 2013. Operations without wage employees worked an average of 58 days.

## Family Business

Of the estimated 1,200 placer miners, approximately 155 employees were members of the permitted operator's family. Nearly half (47 percent) of the active placer operators with employees had at least one family member working on their claim. On average, these family-oriented operations have 1.7 family members employed.

### Alaska Placer Mines with Family Members as Employees, 2013

Number of Family Members Employed	% of Total
1	63%
2	21
3	10
4	1
5+	4
<b>Average number of family members employed</b>	<b>1.7</b>

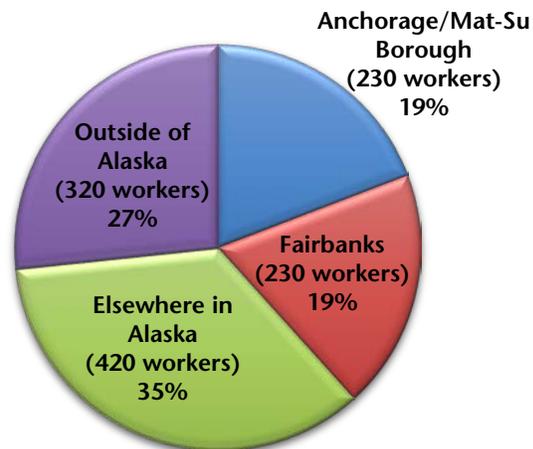
\*Includes only family employees (excluding operators).

Source: McDowell Group Placer Miner Survey, 2014.

## Worker Residency

Three out of four placer mine workers (73 percent) live in Alaska. Many workers (including owner/operator) live in Anchorage or Mat-Su Borough (19 percent) or Fairbanks (19 percent). The remaining 35 percent live elsewhere in Alaska.

### Estimated Number of Alaska Placer Mine Workers, by Region of Residency, 2013



\*Estimates include mine operator and their employees, working family members, and working business partners.

Source: McDowell Group Placer Miner Survey, 2014.

## Labor Income

Alaska's placer mining industry generated an estimated total of \$40 million in wages and other income for participants in the industry. This estimate includes wages, value of production shares, and profits for owners. It is common practice in small mines for partners, family members, friends and some hired workers to earn a share of gold production value rather than a wage. Like many sole proprietors, most solo miners keep any profit that remains at year-end after expenses are paid, rather than taking a regular wage. Based on survey results, just over half (56 percent) of placer workers received a wage.

## Spending on Goods and Services

Based on an extrapolation of survey results, it is estimated that placer miners spent approximately \$65 million for goods and services in support of their operations in 2013; of which approximately 88 percent (or \$57 million) was spent in Alaska.

### Estimated Alaska Placer Mining Goods and Services Spending, 2013

	Amount
Spending in Alaska	\$57.1 million
Spending outside of Alaska	\$7.9 million
<b>Total</b>	<b>\$65.0 million</b>

Source: McDowell Group Placer Miner Survey, 2014 and McDowell Group estimates.

## Expenditures by Category

Placer miners spend money on a wide variety of goods and services. Of all categories, spending on fuel and lubricants were the highest, at an estimated \$13.2 million in 2013. An estimated \$10.3 million was spent on equipment purchases and rentals, followed by approximately \$5.6 million on equipment maintenance. Approximately \$10.8 million was spent on supplies and professional services. An additional \$17.2 million was spent on a variety of other goods and services used in support of mining operations.

### Estimated Alaska Placer Mining Goods and Services Spending in Alaska, by Spending Category, 2013

Expenditure	Amount
Fuel and lubricants (diesel, gasoline, propane, lube oil, etc.)	\$13.2 million
Equipment purchase/rental (heavy equipment, trucks, pumps, wash plants, sluice boxes, dredges, etc.)	\$10.3 million
Equipment maintenance (parts and non-mine labor, etc.)	\$5.6 million
Supplies (tools, lumber, camp supplies, food, steel, welding supplies, etc.)	\$5.5 million
Professional services (consultants, accounting, insurance, legal, etc.)	\$5.3 million
All other expenses (freight, utilities, smelter fees, shop rent, travel, office rent, drillers, etc.)	\$17.2 million
<b>Total estimated spending on goods and services in Alaska</b>	<b>\$57.1 million</b>

Source: McDowell Group Placer Miner Survey, 2014, and McDowell Group estimates.

## Spending by Region

In 2013, about half of the in-state spending (\$32.4 million) occurred in the Fairbanks area. Major purchases included fuel and lubricants (\$9.8 million), and equipment purchases and rental (\$4.8 million). Another \$17.8 million was spent in Fairbanks on a variety of other expenses, including equipment maintenance, supplies, professional services and other goods and services.

Of the estimated \$16.2 million spent in the Anchorage/Mat-Su Borough, \$4.0 million was spent on equipment purchases and rental, and \$2.4 million on professional services (such as accounting and legal assistance).

Approximately \$8.5 million was spent on goods and services purchased elsewhere in Alaska. It is assumed much of that spending occurred in smaller communities in closer proximity to the mine site.

### Estimated Alaska Placer Mining Goods and Services Spending, by Region and Category, 2013

	Fairbanks	Anchorage/ Mat-Su	All Other Alaska	Total Spending
Fuel and lubricants	\$9.8 million	\$1.1 million	\$2.3 million	\$13.2 million
Equipment purchase/rental	4.8 million	4.0 million	1.5 million	10.3 million
Equipment maintenance	3.3 million	1.4 million	900,000	5.6 million
Supplies	2.8 million	1.9 million	800,000	5.5 million
Professional services	1.6 million	2.4 million	1.3 million	5.3 million
All other expenses	10.1 million	5.4 million	1.7 million	17.2 million
<b>Total</b>	<b>\$32.4 million</b>	<b>\$16.2 million</b>	<b>\$8.5 million</b>	<b>\$57.1 million</b>

Source: McDowell Group Placer Miner Survey, 2014 and McDowell Group estimates.

## Multiplier Effects of Placer Mining

The economic impact of placer mining is felt throughout local economies and elsewhere in Alaska. This economic impact occurs at three levels:

- Direct impacts, including the operation's own employment and payroll.
- Indirect impacts, including jobs and income in businesses providing goods and services to the placer operation.
- Induced impacts, including the jobs and income created as a result of the placer operation's employees spending their labor income (payroll or share dollars) in the local economy.

As stated earlier, in 2013, there were approximately 1,200 total placer mine jobs statewide (including full and part-time) with a labor income of \$40 million. In addition to this direct employment, another 500 support sector jobs in Alaska are connected to placer mining, and another \$25 million in labor income. Including all direct, indirect and induced effects, placer mining accounted for 1,700 jobs statewide with \$65 million in labor income in 2013.

Alaska's placer mining industry directly accounted for \$97 million in economic activity in 2013, including \$40 million in labor income and \$57 million in purchases of goods and services. Including all multiplier effects, the industry accounted for \$150 million in total spending activity in Alaska.

### Alaska Placer Mine-Related Economic Impacts, 2013

	Direct	Total Impacts
Employment (year-round and seasonal jobs)	1,200	1,700
Total labor income	\$40 million	\$65 million
Total in-state expenditures*	\$97 million	\$150 million

\*Includes labor costs.

Source: McDowell Group Placer Miner Survey, 2014 and McDowell Group analysis.

### Regional Impacts

The regional distribution of the placer mining industry's economic impacts depends on where the mining activity occurs, where spending in support of that activity occurs, and where workers in the industry spend their income (mostly where they live). Overall, the placer mining industry accounts for 1,700 jobs in Alaska, including direct, indirect and induced employment. That total includes approximately 320 non-residents who are employed in Alaska placer mines.

The placer mine industry accounts for approximately 450 jobs for Fairbanks area residents, another 370 jobs for Anchorage/Mat-Su area residents, and 600 jobs elsewhere in the state, including all impacts (direct, indirect, and induced). Estimated total labor income for Fairbanks residents is \$19 million, \$15 million for the Anchorage/Mat-Su area, and \$23 million elsewhere in Alaska.

### Alaska Placer Mine Regional Employment and Labor Income, by Place of Residence, 2013

	Total Jobs	Total Labor Income
Fairbanks	450	\$19 million
Anchorage/Mat-Su	370	15 million
Elsewhere in Alaska	600	23 million
Non-Residents	320	8 million
<b>Total in-state</b>	<b>1,700</b>	<b>\$65 million</b>

Source: McDowell Group Placer Miner Survey, 2014 and McDowell Group analysis.

# State Revenue Payments

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The placer mining industry generates revenues to the State of Alaska through a number of mechanisms, such as license fees, rentals, royalties, material sales, and other fees. Due to confidentiality issues and other data restrictions, estimates of state revenue stemming from placer mining-related activity could not be made. The various forms of revenue gathered by the state, however, are described below.

## Royalties

### Production Royalty

Alaska's Production Royalty law (AS 38.05.212) requires holders of state mining locations to pay a production royalty on all revenues received from minerals produced on state land. The production royalty is 3 percent of net income as determined under the Mining License Tax Law (AS 43.65), and regulations (15 AAC 65). A production royalty return must be filed and all required royalty payments must be made by anyone:

- 1) Owning, leasing, and operating a mining property,
- 2) Owning a mining property and receiving lease fees, royalty payments based on production, or a combination of lease fees and royalty payments from the property,
- 3) Leasing a mining property from another person and operating the property, and
- 4) Possessing a mineral interest, whether an economic or production interest, in a producing property, including royalty, receiving lease fees, working or operating interests, net profits, overriding royalties, carried interests in, and production payments.

### Alaska Permanent Fund

The Alaska Constitution was amended in 1977 to establish a permanent investment fund into which "at least 25 percent of all mineral lease rentals, royalties, royalty sale proceeds, federal mineral revenue sharing payments and bonuses received by the state" are to be deposited annually.<sup>3</sup> This 25 percent applied to state mining leases issued on or before December 1, 1979. Mines operating with state leases issued after December 1, 1979 pay 50 percent.

## Taxes

### Mining License Tax

This is a tax on the net income of all mining property in the state irrespective of land ownership status, capped at 7 percent for mining net income of \$100,000 or more, less exploration and other credits. No mining license tax is paid if mining net income is \$40,000 or less. Except for sand and gravel operations, new mining operations are exempt from the mining license tax for a period of 3.5 years after production begins.

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<sup>3</sup> AS 37.13.010.

## **Corporate Net Income Tax**

All corporations doing business in Alaska must file a tax return. The corporate net income tax payment is a reflection of a corporation's profitability. The State of Alaska levies a corporate net income tax based on federal taxable income with certain Alaska adjustments. Tax rates are graduated from 1 to 9.4 percent in increments of \$10,000 of taxable income. The maximum rate (9.4 percent) applies to taxable income of \$90,000 and higher.

## **State Fuels Tax**

Placer miners also use a significant amount of fuel in their operations. Alaska levies a motor fuel tax (\$0.08 per gallon) on motor fuel sold, transferred or used within Alaska.

## **Annual Claim Rental**

The Annual Rental law (AS 38.05.211) requires locators and holders of State mining locations to pay an annual cash rental. The requirement applies to mining claims, leasehold mining leases, offshore mining leases and prospecting sites on state land. For all traditional mining claims (40 acres), the annual rental amount is \$35 per year for the first five years, \$70 per year for the second five years, and \$170 per year thereafter. For quarter section mining claim (160 acres), the annual rental amount is \$140 per year for the first five years, \$280 per year for the second five years, and \$680 per year thereafter. For all leases, the annual rent is \$.88 per acre per year for the first five years, \$1.75 per acre for the second five years, and \$4.25 per acre per year thereafter. It is noted that an acre is approximately 208 by 208 feet. For prospecting sites, there is a one-time upfront requirement of \$255, which covers the two-year term of the site.

## **Annual Labor**

Every year, the holder of a mining claim, leasehold location, or mining lease must complete an affidavit stating a minimum of \$400 worth of labor or improvements were performed on or for the benefit of development of each claim or make a minimum cash payment to the state of \$100 for each claim.

## **Other State Mining Fees**

These fees include Application for Permits to Mine in Alaska (APMA) fees and Bond Pool payments, and other fees or penalties.

### **Application for Permits to Mine in Alaska (APMA)**

To mine in Alaska, permits and licenses are required from as many as 12 government agencies. The Application for Permits to Mine (APMA) in Alaska is required if a placer miner wishes to explore for and mine locatable minerals (regardless of private or public land ownership), as well as conduct reclamation. APMA can be issued in terms of one to five years. A "single-year" application fee is \$150. A "multi-year" application fee is \$150 for the first year, and \$50 for each subsequent year (up to five years total), to a maximum of \$350.

## **Reclamation Bond**

A reclamation bond is required if the placer miner disturbs more than 5 acres. Placer miners pay into the Department of Natural Resources' Bond Pool at \$150 per acre. A portion of this bond is refundable once the reclamation work has been approved.