

## 2.12 Construction Phase

The construction phase for the on-site portions of the Rosemont Copper Project will last about 18 months and will begin as soon as a Record of Decision is received and all necessary permits are in place. Some off-site construction activities will begin earlier, with the appropriate permits. The off-site activities include the fresh water well development, the fresh-water pipeline and pumping stations, and the 138 kV transmission line. These activities are located on patented land or state trust land on the western side of the Santa Rita Mountains. The description of the transportation requirements during construction addresses the traffic on SR 83 and the eastern access road to the mine site and process facilities.

### 2.12.1 Transportation

Transportation during the construction phase will involve construction personnel arriving and leaving the site and the delivery of the required equipment and materials. Access to the site will be by federal and state highways up to the east access road from SR 83. The intersection of SR 83 and the plant access road will be upgraded with turn-out lanes and acceleration/deceleration lanes as early as possible. Specifically, during and before traffic volume increases due to construction activities. The work schedule during construction is expected to be ten hours per day, five days per week, with no activity on weekends. Occasional overtime may occur on Saturdays to maintain the construction schedule. Shift times will start at 6:00 a.m. to 4:30 p.m., with a half-hour lunch period. During the summer months, work may start an hour earlier to take advantage of the coolest time of day.

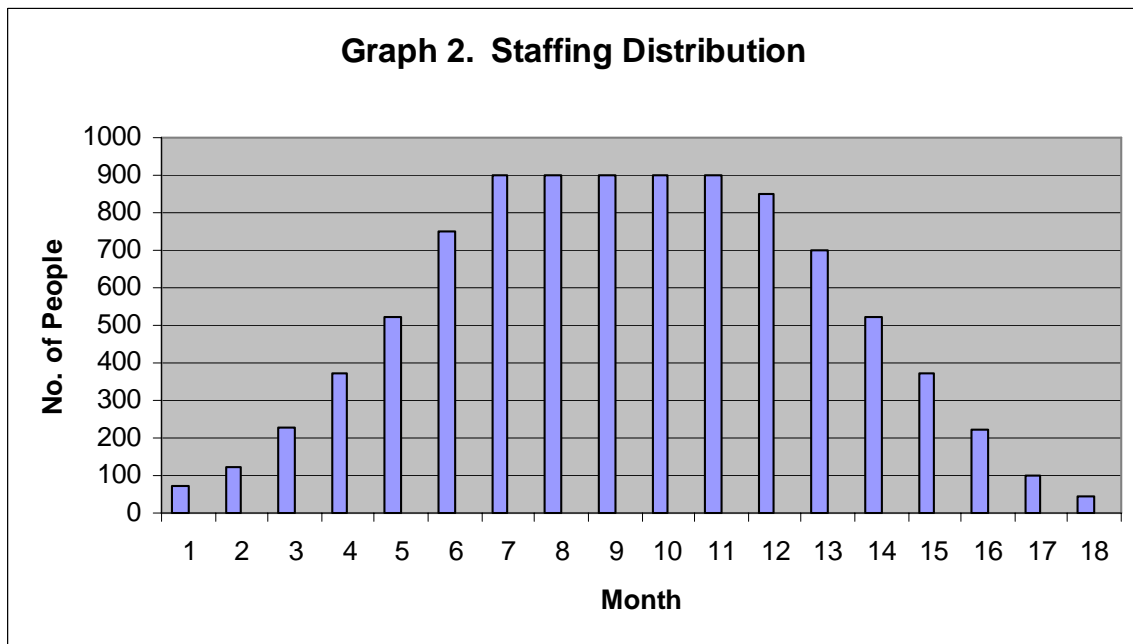
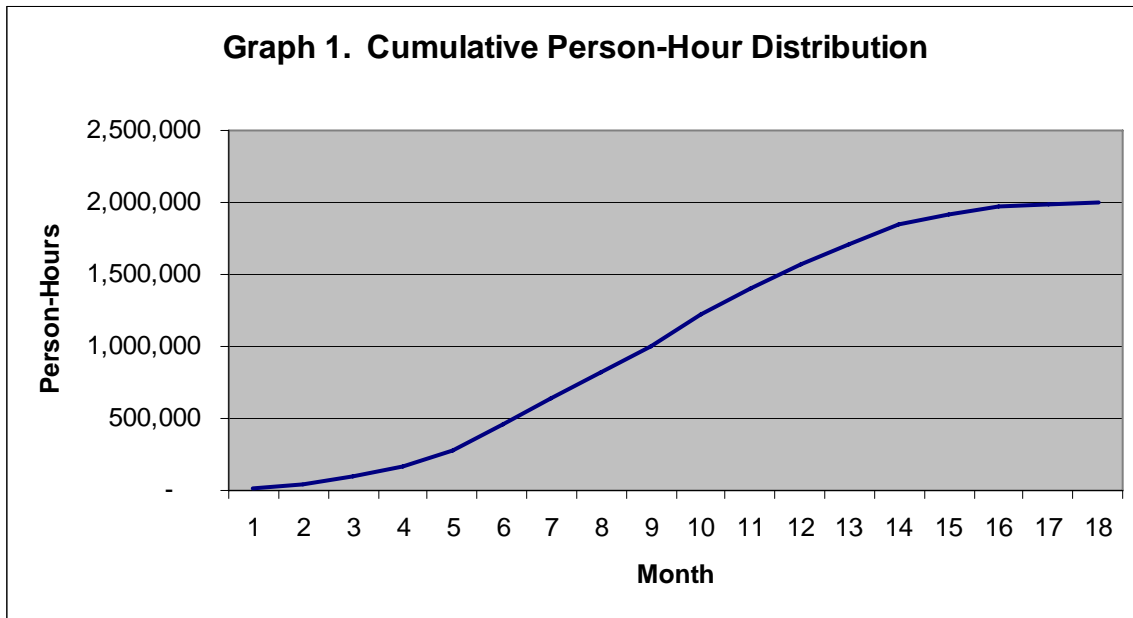
### 2.12.2 Personnel

A total of 2.0 million construction craft worker-hours are expected for the on-site work. Employee levels will increase to about 125 in the second month and will peak at about 900 in the seventh month. Peak employment will be maintained for about five months, then start declining to about 225 in month 16 and 45 in the last month.

The majority of the construction crews are expected to come from the Tucson and Green Valley areas; however, some may also come from the Sonoita area and points south. Crews will be bussed from staging areas along I-10 to the north and Sonoita to the south in order to avoid increased traffic along SR 83 between I-10 and Sonoita. The staging areas will be determined when the boarding locations of the riders are known. The bus traffic will peak at about 20 to 26 trips between the sixth month and the thirteenth month of construction, based on bus loads of about 35 people.

In addition to the craft labor, each contractor on site and the construction management contractor will have supervisory staff arriving at the plant. The construction management contractor is expected to have a supervisory and office staff of about 47 people and will require about 12 trips into and out of the plant, based on an average carpool of four people per vehicle. Approximately 11 additional contractors will be on site during the peak months with total supervisory and office staff of about 57 people. This will require about 28 trips into and out of the plant, based on about two people per vehicle.

Graphs 1 and 2 show the expected person -hours and staffing distribution by month.



### 2.12.3 Major Equipment

Major equipment arriving by rail will be received at the Port of Tucson located near Vail, Arizona. Loads will be moved into a staging area for scheduled shipments by truck to the site. Equipment and materials can be held at the Port of Tucson until needed at the site to regulate the arrival of major equipment. The

logistics coordinator from the construction management contractor will coordinate the shipments of major equipment and materials by truck to avoid arrival of more materials at the site than can reasonably be handled. These controls will allow delivery of the materials to site when needed and stagger the shipments to avoid excessive traffic.

The first major equipment to arrive at the site will be the haul trucks, shovels, dozers, graders, drills and water trucks which will be used to start the pre-development mining. Haul trucks arrive in about seven truckloads for each truck and will be assembled on site. A total of 22 haul trucks will be purchased and delivered to site during the construction period, which will require 154 truck loads. Mine shovels will arrive in about 19 truckloads per shovel and will also be assembled on site. Three shovels will be purchased and delivered during construction, requiring about 57 truck loads. Two large, 33-yard front-end loaders will be purchased and will arrive in 26 truckloads for assembly on site. A total of four rotary and percussion drills will be purchased and will arrive on about six trucks. A total of seven crawler and rubber-tired dozers will be purchased and will arrive in about 19 truck loads. Two water trucks will be purchased and will arrive on site in about four truck loads. There will be three graders purchased which will arrive on individual shipments of one grader per truck. The 43 complete pieces of mine equipment will be delivered over a 16-week period starting in the second month and will average about 17 trucks per week for a four-month period. This will average three to four trucks per day during this period.

A summary of the major mine equipment shipments are shown in Table 7.

**Table 7. Mine Equipment**

<b>Mine Equipment</b>	<b>Number</b>	<b>Items/ Shipment</b>	<b>Total Shipments</b>	<b>Duration Weeks</b>	<b>Trucks/ Week</b>
Haul Trucks	22	7	154		
Shovels	3	19	57		
Front End Loader	2	13	26		
Drills	4	1.5	6		
Dozers	5	3	15		
RT Dozers	2	2	4		
Graders	3	1	3		
Water Trucks	2	2	4		
<b>TOTALS</b>	<b>43</b>		<b>269</b>	<b>16</b>	<b>17</b>

The major process equipment is summarized in Table 8. Major equipment quantities are tabulated, and the total number of truck shipments to the site is estimated to be 624. Major process equipment will be delivered over a 36-week period starting in the fifth month. Assuming the shipments are distributed evenly, the average number of shipments per week will be about 18, or a peak of four shipments per day.

Table 8. Process Equipment

Process Equipment	Quantity	Items / Shipment	Total Shipments	Duration Weeks	Trucks / Week
Agitators	21	0.25	6		
ANFO / Lime Storage Bins	4	1	4		
Air Compressors	13	0.5	7		
Primary Crusher	1		6		
Conveyors	9		80		
Dry Tailings Conveyors	15		166		
Cyclone Clusters	6	0.5	3		
Dust Collectors	6	0.5	3		
Hollow Flite Dryer	1	1	1		
Moly Packing System	1	1	1		
Cathode Stripping Machine	1	1	1		
Anodes	Lot		7		
Cathodes	Lot		3		
Barge and Pumps	3	1	3		
Reagent Systems	3	1	3		
Electrowinning Cells	24	1	24		
Flotation Cells	38	1	38		
Apron Feeders	6	1	6		
Clarkson Feeders	29		2		
Disc Filters	13	1	13		
Electrolyte Filters	2	1	2		
Clay Filter	1	1	1		
Package Boiler	1	2	2		
Bridge Cranes	11	2	22		
Chiller	1	1	1		
Electrolyte Heat Exchanger	2	0.5	1		
Mill Liner Handler	2	1	2		
SAG Mill	1	8	8		
Ball Mills	2	8	16		
SAG Mill Motor	1	7			
Ball Mill Motors	2	14			
Pebble Crusher	1	1			
Pebble Wash Screen	1	1			
Thickeners	4	16			
Regrind Mill	4	4	16		
Pumps	255	0.25	64		
Pressure Vessels	30	0.3	9		
Rock Breaker	1	1	1		
Transformer / Rectifier -EW	1	2	2		
Samplers	18	0.28	6		
Truck Scale	1	4	4		
Shop Tanks	63	1	63		
Misc. Mobile Equipment	35	1	35		
<b>Total Trips Major Process Equipment</b>			<b>671</b>	<b>36</b>	<b>19</b>

### 2.12.4 Electrical Equipment & Materials

Electrical equipment and materials consist of main and area transformers, breakers, motor control centers, electrical rooms, electrical cable, cable trays and miscellaneous components, as shown in Table 9. There will be 18 transformers totaling about 547 T which will arrive in 18 truckloads. Some loads will be oversized on special transports. Breakers will arrive one per load on seven trucks. Eighteen switchgears weighing about 86 T will arrive in four truckloads. About 23 motor control centers will arrive in eight trucks averaging three motor-control centers per truck. About 12 portable electrical rooms will arrive on separate trucks. About 144 T of electrical cable required and will require six truckloads at about 24 T per truck. An allowance for 18 T of miscellaneous components, including cable trays, is also included.

**Table 9. Electrical Materials**

Electrical Materials	Quantity	Tons	Trips	Weeks	Trucks/ Week
Transformers	18	547	18		
Breakers	7	11	7		
Switchgear	18	86	4		
MCCs	23	39	8		
Portable Buildings	12	228	12		
Cable, lbs	287,208	144	6		
Cable Trays / Misc., lbs	35,000	18	2		
			57	47	2

### 2.12.5 Construction Materials

Construction materials consist of concrete, structural steel, bulk piping, mechanical platework, and minor equipment. About 50,900 cy of concrete will be required. A batch plant will be constructed and it has been determined that adequate sand and gravel is available on site for the plant. Cement will be delivered by truck at a rate of 450 lbs per cy of concrete. A total of 11,450 T of cement will be required starting in the fourth month and continuing for approximately 40 weeks. Based on shipments of 24 T per truck, the total number of trucks required for cement is about 477, or about 12 trucks per week. Re-bar needed for the concrete is about 4,540 T or about 189 trucks at 24 T per truck. Re-bar shipments will average about five trucks per week over the same 40-week period.

The estimated quantity of structural steel is about 4,100 T consisting of light, medium and heavy steel. Based on truckloads of 24 T, the steel shipments will arrive in 170 truckloads starting in the seventh month and continuing for about 38 weeks. The shipments will average about five trucks per week during this period.

Mechanical platework is estimated to be about 311 T, or 13 truck loads are required based on shipments of 24 T per truck. Mechanical platework shipments will start in the tenth month and continue for about 35 weeks and will average less than one truckload per week.

Piping consists of HDPE, carbon steel, stainless steel and PVC pipe. Approximately 750 T of HDPE, 340 T of carbon steel, 105 T of stainless steel, and 3 T of PVC pipe will be received at the site by truck. Shipments will start in the eighth month and will continue for about 26 weeks. An allowance of 25% has been added to cover valves, fittings, gaskets, nuts and bolts to install the pipe. The total shipments of pipe and pipe materials are expected to be about three trucks per week for the 26-week duration.

Minor equipment and miscellaneous construction materials are difficult to quantify at this stage; however, an additional 50% of the quantified construction material was made to cover the miscellaneous materials. This adds another 14 trucks per week during months 10 through 13.

### 2.12.6 Fuels and Lubricants

Fuels and lubricants will be used primarily by the haul trucks and ancillary equipment during the construction phase. It is expected that the fuels and lubricant will be less than required during operation; however, an allowance of 2,000 gallons per week, or one truck per week, was made based on the quantity required during operation, as noted in Section 2.10.9.

### 2.12.7 Summary

Graph 3 is a summary of the expected traffic distribution during the construction phase. During the peak construction period, the total traffic into the plant is expected to be 364 trucks per week for labor and materials, or an average of 73 trucks per day. This peak period is about two months long during month eight and nine of construction. Craft and supervisory personnel will have the largest impact on the traffic pattern and trips will peak at about 61 per day. Material and equipment traffic will peak at about 13 trips per day. Each trip is defined as a truck or bus entering the site with a load and departing empty. The traffic is distributed throughout the construction shift, while laborers will arrive before starting time and depart at the end of the shift. Material and equipment will arrive throughout the shift and will average just over one shipment per hour.

