



PERMIT NUMBER: 010182
BUSINESS NAME: Tpac, An EnCon Company
SOURCE TYPE: Precast/prestressed concrete products
PERMIT ENGINEER: Lizabeth Gomez

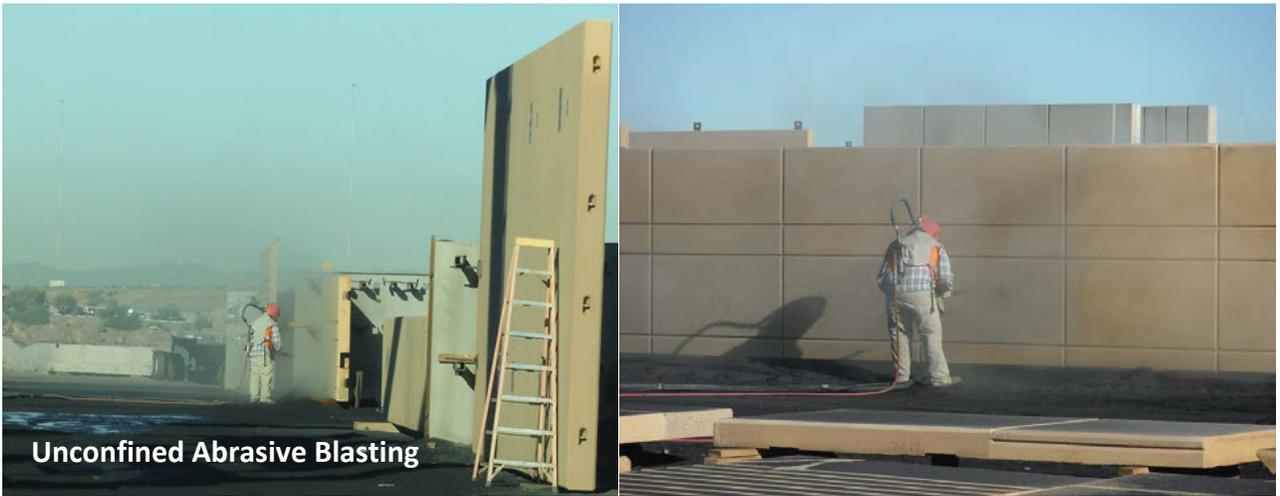
App. ID(s): 410343
Revision(s): Renewal
Revision Type(s): 3.0.0.0
Date Prepared: 03/10/2016

BACT: No **40 CFR Part 63 :** No **40 CFR Part 60 :** Yes **SYNTH MINOR:** No **AIRS:** No
DUST PLAN REQUIRED: Yes **DUST PLAN RECEIVED:** Yes
O&M PLAN REQUIRED: Yes **O&M PLAN RECEIVED:** Yes
PORTABLE SOURCE: No **SITE VISIT:** Waived

PROCESS DESCRIPTION:

Tpac manufactures precast/prestressed concrete products for building structures, bridges, garages, etc. The main pollutant emitted by the facility is particulate matter (PM) by the concrete batch plant and unconfined abrasive blasting operations. The facility also has several fuel burning equipment used to heat the concrete during manufacturing, which emit products of combustion, such as carbon monoxide (CO), nitrogen oxides (NO_x), sulfur oxides (SO_x), volatile organic compounds (VOC), and PM. Below are a few images of the concrete batch plant, unconfined abrasive blasting operations, and fuel burning equipment. The facility utilizes dust collectors on all the silos and mixers and performs wet blasting to reduce the PM emissions.





Unconfined Abrasive Blasting



Natural Gas Boilers



Burners – Vapor Generators

PERMIT HISTORY:

Date	Revision	Description
09/12/2001	0.0.0.0	Application received for new Non-Title V permit to manufacture pre-stressed/precast concrete products in Phoenix, AZ.
01/02/2003	0.0.1.0	Minor modification application submitted to update equipment list.

07/14/2006	1.0.0.0	Submitted permit renewal application.
06/23/2008	1.0.0.1	Administrative change to update permit issuance date, no change to permit or conditions.
07/02/2008	1.0.1.0	Minor modification application submitted requesting to omit the rumble grate and abrasive blasting requirements.
11/24/2008	1.0.1.1	Seven day notification to add cement storage silo to equipment list.
06/06/2011	1.0.1.2	Administrative change to remove gasoline tank from equipment list per e-mail from the source, no change to permit or conditions.
07/28/2011	2.0.0.0	Submitted permit renewal application.
12/01/2011	2.0.0.1	Administrative change to update permit renewal date, no change to permit or conditions.
12/17/2013	2.0.0.2	Administrative change to update equipment list, no change to permit or conditions.
12/17/2013	2.0.0.3	Administrative change to update equipment list, no change to permit or conditions.
10/28/2014	2.0.1.0	Minor modification application submitted to increase abrasive blasting material throughput and to revise boiler tuning requirement.
01/15/2016	3.0.0.0	Permit renewal application received.
01/22/2016	---	Permit transfer to change Tpac ownership from a division of Kiewit Western Co. to En Con Arizona.

PURPOSE FOR APPLICATION: Renewal

A. APPLICABLE COUNTY REGULATIONS:

- Rule 100: General Provisions and Definitions
- Rule 200: Permit Requirements
- Rule 220: Non-Title V Permit Provisions
- Rule 280: Fees – Table B (Concrete Product Manufacturing)
- Rule 300: Visible Emissions
- Rule 312: Abrasive Blasting
- Rule 316: Nonmetallic Mineral Mining and Processing
- Rule 323: Fuel Burning Equipment from Industrial/Commercial/Institutional (ICI) Sources

B. APPLICABLE FEDERAL REGULATIONS:

40 CFR Part 60 Subpart Dc (Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units)

The natural gas Johnson Brooks boiler **is subject** to this subpart, per §60.40c(a), since it is a steam generating unit constructed after June 9, 1989 with a maximum design heat input capacity greater than 10 MMBtu/Hr but less than 100 MMBtu/Hr.

40 CFR Part 63 Subpart JJJJJ (National Emissions Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources)

The natural gas boilers at this facility **are not subject** to this subpart, per §63.11195(e), since they meet the definition of a gas-fired boilers.

C. AIR POLLUTION CONTROL EQUIPMENT/EMISSION CONTROL SYSTEM(S):

The facility has the following dust collectors to control the release of PM throughout the concrete batch plant operations:

Dust Collector Location	Manufacturer	Model	CFM	Comments
Silo #1	C&W	CP-LPR-8-S	2,340	
Silo #2	C&W	CP-LPR-8-S	2,340	
Silo #5	WAM	CJS-250	1,600	
Silo #6	WAM	CJS-250	1,600	Not in operation

Silo #7/VPG2100 Silo	C&W	CP-LPR-8-S	2,340	
Flyash surge Silo	C&W	CP-LPR-8-S	2,340	
Cement weigh batcher	C&W	CP-70	432	
North mixer	Besser	DCS-260	1,200	
South mixer	Besser	DCS-260	1,200	
Silo #4	Besser	DC 1640	1,200	Not in operation

The facility also uses a rumble grate, street sweeper, and water truck to comply with the fugitive dust control measures required per Rule 316. The facility has on file an approved O&M Plan for the dust collectors listed above, as well as for the rumble grate, street sweeper, and water truck.

The facility also has the following dust collectors on-site. However, since they are not in operation and are currently in the process of being sold, they do not have an O&M Plan.

*Ross Concrete Batch Plant	Quantity	Comments
Ross plant silo, 6CP-500, cartridge filter	1	No O&M Plan. Not in operation.
Ross plant west silo, Besser DC1640, sock filter	1	
Ross plant flyash & mixer, 1CP-H, cartridge filter	2	
Ross plant C&W mixer vent, CP-230, cartridge filter	1	

* The Ross Concrete Batch Plant is not in operation and currently in the process of being sold.

D. EMISSIONS:

Concrete Batch Plant

PM emissions from the manufacturing of cement products were estimated using the emission factors from AP-42 Chapter 11.12. The emissions were updated according to the material usage of sand, aggregate, cement, and cement supplement, which were based on the allowable concrete production limit of 300,000 cubic yards per year and the composition of each component in one yard of concrete.

The emission factor for stockpiling was obtained from the MCAQD Emissions Inventory Help Sheet for Concrete Batch Plants (2015), while the fugitive emissions from vehicle traffic were estimated according to the emission factors from MCAQD Emissions Inventory Help Sheet for Vehicle Travel on Unpaved Roads (2015). The stockpile acreage and vehicle miles traveled were obtained from the facility’s 2012 Emissions Inventory Survey.

PM emissions were categorized as either process (non-fugitive) or fugitive emissions. Process emissions are those that can be captured and controlled, while fugitive emissions are those that could not reasonably pass through a stack, chimney, vent, or other functionally equivalent opening. The allowable PM emissions only include process emissions and exclude any fugitive emissions.

Fuel Burning Equipment

The fuel burning emissions were based on the rated capacities of the natural gas boilers and burners. The emission factors were taken from AP-42 Table 1.4-1(Emission Factors for Nitrogen Oxides (NO_x) and Carbon Monoxide (CO) from Natural Gas Combustion) and Table 1.4-2 (Emission Factors for Criteria Pollutants and Greenhouse Gases from Natural Gas Combustion). Emissions were calculated assuming continuous operation at 24 hours per day and 365 days per year.

Abrasive Blasting

The PM emissions were estimated based on the allowable throughput of abrasive blasting media and the emission factors for uncontrolled abrasive blasting found in AP-42 Table 13.2.6.1. Since these emission factors are specifically for abrasive blasting of steel surfaces using sand, the emission estimates had to be adjusted as follows:

- Since the facility uses copper ore slag (i.e. shot) the emissions factors were assumed to only be 10% of those for abrasive blasting with sand. According to AP-42 Section 13.2.6.3, the total PM emissions from abrasive blasting using shot are about 10% of the total PM emission from abrasive blasting with sand.
- The facility blasts concrete substrates rather than steel, which the emissions factors in AP-42 Table 13.2.6.1 are for. Since the blasting of concrete will result in much higher emissions than if blasting steel, it was assumed that the amount of concrete broken down and released could be roughly estimated to equal

the PM emissions from abrasive blasting with sand.

- Therefore, the total abrasive blasting emissions were estimated to be the sum of the PM released by blasting with copper ore slag and the breakdown of the concrete substrate.
- For each component, the emissions were reduced by 50% since the source conducts wet blasting, which according to AP-42 Section 13.2.6.3 has a control efficiency of at least 50% - 93%.

FACILITY-WIDE ALLOWABLE EMISSIONS

Pollutants	Fuel Burning	Concrete Production	Abrasive Blasting	Facility-wide Emissions	
	lbs/yr	lbs/yr	lbs/yr	lbs/yr	tpy
CO	24,845	-	-	24,845	12.42
NO _x	29,577	-	-	29,577	14.79
PM	2,248	1,965	35,640	39,853	19.93
PM ₁₀	2,248	658	17,160	20,066	10.03
PM _{2.5}	2,248	443	1,716	4,407	2.20
VOC	1,627	-	-	1,627	0.81
SO _x	177	-	-	178	0.09

E. HAP EMISSION IMPACTS:

Based on the information provided in the permit application, the facility emits insignificant amount of HAPs; therefore, SCREEN modeling was not performed per the Department’s HAPs policy.

F. PERFORMANCE TESTING:

Other than tuning the boiler (see Section G.2 below) the facility does not have emission control equipment subject to performance testing.

G. REGULATORY REQUIREMENTS AND MONITORING:

1. *Conditions 1 – 15* were developed using a template for facilities that are subject to Rule 316 but not to NSPS Subpart OOO. References to crushing and/or screening operations (Rule 316 Section 301), asphalt concrete plants (Rule 316 Section 302), or a wash plant were omitted. Emission limits were not included since the enforceable production limit in *Condition 1* will keep the facility from exceeding any regulatory threshold, such as BACT. The daily material limit from the prior permit version was removed since Rule 241 no longer has daily BACT limits.
2. *Conditions 16 – 19* were taken from a template for fuel burning equipment subject to Rule 323 and 40 CFR Part 60 Subpart Dc. *Condition 18* was revised to relieve the Permittee from having to start up the boiler only to tune it. Instead, if the boiler is non-operational, the Permittee shall tune the boiler within 30 days after restarting the unit and subsequently every year after.
3. *Conditions 20 – 25* were taken from the template for abrasive blasting operations subject to Rule 312. The abrasive blasting material throughput in *Condition 20* will keep the facility from exceeding any regulatory threshold, such as BACT. Additionally, per *Condition 24* the Permittee must perform all unconfined abrasive blasting on concrete substrates that exceed 8 ft. in any one dimension using either wet abrasive blasting or vacuum blasting as defined in Rule 312 §§210, 211. For substrates less than 8 ft. in all dimensions, the Permittee must perform confined abrasive blasting per *Condition 23*. The Permittee shall not perform dry abrasive blasting, since PM emissions were reduced by 50% due for wet blasting.
4. *Condition 26* was kept the same from the previous Revision 2.0.0.0, which explains the applicability of Rule 331 to the solvent cleaning machine if it were to lose its de minimis status.
5. The two diesel compressors were classified as de minimis and exempt from permitting since they are mobile and meet the definition in MCAQD Rule 324 for non-road engines. The non-road engine determination forms were submitted by the source on 12/01/2014. The original forms signed on 11/25/2014 were corrected by the Permittee after it was confirmed that the engines are wheeled around within the facility and do not remain in one single location for more than 12-months.

APPENDIX



010182 3.0.0.0
Calculations

Concrete Batching Plant Emissions							
Company Name:	Tpac, An En Con Company						
Permit Number:	010182						
Central Mix?	Yes						
Emissions from Mixer Controlled?	Yes						
Number of conveyors:	1						
Stockpiles	0.18 acres						
Light Duty Vehicles @10 mph	15,180 VMT						
Medium Duty Vehicles @10 mph	14,113 VMT						
Heavy Duty Vehicles @10 mph	5,582 VMT						
Concrete Production:	300,000 yd³/yr						
Mass of a cubic yard of concrete ¹ :							
Coarse Aggregate:	1,865 lbs						
Sand:	1,428 lbs						
Cement:	491 lbs						
Cement Supplement:	73 lbs						
<u>Maximum Annual Materials Usage²:</u>							
Sand	214,200 tons/yr						
Aggregate	279,750 tons/yr						
Cement	73,650 tons/yr						
Fly Ash	10,950 tons/yr						
PM Emissions: [based on AP-42, Chapter 11.12 emission factors (June 2006)]							
	PM10 EF (lb/ton)¹	PM EF (lb/ton)¹	Controlled Emission Factor?	Control Efficiency	PM 10 Emissions (lbs/yr)	PM Emissions (lbs/yr)	
Concrete Batching (Process Emissions):							
Cement unloading to silo:	0.00034	0.00099	Yes	0%	25	73	
Flyash unloading to silo:	0.0049	0.0089	Yes	0%	54	97	
Aggregate transfer to conveyor	0.0033	0.0069	No	90%	92	193	
Sand transfer to conveyor	0.00099	0.0021	No	90%	21	45	
Mixer Loading, Central Mix (cement + fly ash):	0.0055	0.0184	Yes	0%	465	1,557	
Concrete Batching (Fugitive Emissions):							
Sand transfer to elevated storage bin	0.00099	0.0021	No	90%	21	45	
Aggregate delivery to ground storage	0.0033	0.0069	No	90%	92	193	
Aggregate transfer to elevated storage bin	0.0033	0.0069	No	90%	92	193	
Sand delivery to ground storage	0.00099	0.0021	No	90%	21	45	
Weigh hopper loading (sand + Aggregate):	0.0028	0.0048	No	90%	138	237	
Fugitive Stockpile Emissions (PM-10)							
	EF (lb/acre)³						
Storage Piles	630		No	90%	12	12	
Fugitive Emissions From Vehicle Traffic							
	(lb/VMT)⁴						
Light Duty Vehicles @10 mph	0.29		No	90%	440	440	
Medium Duty Vehicles @10 mph	0.57		No	90%	804	804	
Heavy Duty Vehicles @10 mph	2.13		No	90%	1,189	1,189	

Non-Fugitive Emissions Only ⁵		
PM _{2.5}	443 lbs/yr	0.22 tons/yr
PM ₁₀	658 lbs/yr	0.33 tons/yr
PM	1,965 lbs/yr	0.98 tons/yr

Non-Fugitive & Fugitive Emissions ⁵		
PM _{2.5}	2,337 lbs/yr	1.17 tons/yr
PM ₁₀	3,468 lbs/yr	1.73 tons/yr
PM	5,123 lbs/yr	2.56 tons/yr

NOTES:

- ¹ Emission factors for concrete batching were obtained from AP-42, Chapter 11.12 (June 2006).
- ² Material usage based on annual concrete production and the individual mass composition of one yard of concrete
- ³ The emission factor for stockpiling was obtained from the MCAQD Emissions Inventory Help Sheet for Concrete Batch Plants (2015).
- ⁴ Emission factors for vehicle traffic taken from MCAQD Emissions Inventory Help Sheet for Vehicle Travel on Unpaved Roads (2015).
- ⁵ PM_{2.5} fraction of PM₁₀ assumed to be 0.674 based on the profiles in the California Emission Inventory Data and Reporting System (CEIDARS) developed by California Air Resources Board (CARB); Reference: Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds (October 2006).

HAPs					
	Cement Silo Filling (SCC 3-05-011-07) w/ Fabric Filter	Cement Supplement Silo Filling (SCC 3-05-011-17) w/ Fabric Filter	Central Mix Batching (SCC 3-05-011-09) w/ Fabric Filter	Truck Loading (SCC 3-05-011-10) w/ Fabric Filter	Single HAP (lbs/yr)
Arsenic	4.14E-09	1.00E-06	2.96E-07	6.02E-07	0.09
Beryllium	4.86E-10	9.04E-08	0.00E+00	1.04E-07	0.01
Cadmium	0.00E+00	1.98E-10	7.10E-10	9.06E-09	0.00
Total Chromium	2.90E-08	1.22E-06	1.22E-07	4.10E-06	0.37
Lead	1.09E-08	5.20E-07	3.66E-08	1.53E-06	0.14
Manganese	1.17E-07	2.56E-07	3.78E-06	2.08E-05	2.09
Nickel	4.18E-08	2.28E-06	2.48E-07	4.78E-06	0.45
Total Phosphorus	0.00E+00	3.54E-06	1.20E-06	1.23E-05	1.18
Selenium	0.00E+00	7.24E-08	0.00E+00	1.13E-07	0.01
				Total HAPS	4.35

TABLE 11.12-8 (ENGLISH UNITS)
CONCRETE BATCH PLANT METAL EMISSION FACTORS ^a

	Arsenic	Beryllium	Cadmium	Total Chromium	Lead	Manganese	Nickel	Total Phosphorus	Selenium	Emission Factor Rating
Cement Silo Filling ^b (SCC 3-05-011-07) w/ Fabric Filter	1.68e-06 4.24e-09	1.79e-08 4.86e-10	2.34e-07 ND	2.52e-07 2.90e-08	7.36e-07 1.09e-08	2.02e-04 1.17e-07	1.76e-05 4.18e-08	1.18e-05 ND	ND ND	E E
Cement Supplement Silo Filling ^c (SCC 3-05-011-17) w/ Fabric Filter	ND 1.00e-06	ND 9.04e-08	ND 1.98e-10	ND 1.22e-06	ND 5.20e-07	ND 2.56e-07	ND 2.28e-06	ND 3.54e-06	ND 7.24e-08	E E
Central Mix Batching ^d (SCC 3-05-011-09) w/ Fabric Filter	8.38e-06 2.96e-07	ND ND	1.18e-08 7.10e-10	1.42e-06 1.27e-07	3.82e-07 3.66e-08	6.12e-05 3.78e-06	3.28e-06 2.48e-07	2.02e-05 1.20e-06	ND ND	E E
Truck Loading ^e (SCC 3-05-011-10) w/ Fabric Filter	1.22e-05 6.02e-07	2.44e-07 1.04e-07	3.42e-08 9.06e-09	1.14e-05 4.10e-06	3.62e-06 1.53e-06	6.12e-05 2.08e-05	1.19e-05 4.78e-06	3.84e-05 1.23e-05	2.62e-06 1.13e-07	E E

ND=No data

^a All emission factors are in lb of pollutant per ton of material loaded unless noted otherwise. Loaded material includes course aggregate, sand, cement, cement supplement and the surface moisture associated with these materials. The average material composition of concrete batches presented in references 9 and 10 was 1865 lbs course aggregate, 1428 lbs sand, 491 lbs cement and 73 lbs cement supplement. Approximately 20 gallons of water was added to this solid material to produce 4024 lbs (one cubic yard) of concrete.

^b The uncontrolled emission factors were developed from Reference 9. The controlled emission factors were developed from Reference 9 and 10. Although controlled emissions of phosphorus compounds were below detection, it is reasonable to assume that the effectiveness is comparable to the average effectiveness (98%) for the other metals.

^c Reference 10.

^d Reference 9. The emission factor units are lb of pollutant per ton of cement and cement supplement. Emission factors were developed from a typical central mix operation. The average estimate of the percent of emissions captured during each test run is 94%.

^e Reference 9 and 10. The emission factor units are lb of pollutant per ton of cement and cement supplement. Emission factors were developed from two typical truck mix loading operations. Based upon visual observations of every loading operation during the two test programs, the average capture efficiency during the testing was 71%.

Abrasive Blasting

Company: Tpac, An En Con Company
Permit: 010182

Emission factors taken from AP-42 Table 13.2.6-1: Particulate Emission Factors for Abrasive Blasting

Abrasive blasting material throughput = **1,200** tons/yr

Blasting emissions using copper ore slag (i.e. shot):

Particle Size	¹ Emission Factor (lb/1000 lb abrasive)	² Control Efficiency	Emissions (lbs /yr)
Total PM	2.7	50%	3,240
PM10	1.3	50%	1,560
PM2.5	0.13	50%	156

PM released from blasting concrete substrate:

Particle Size	³ Emission Factor (lb/1000 lb abrasive)	² Control Efficiency	Emissions (lbs /yr)
Total PM	27	50%	32,400
PM10	13	50%	15,600
PM2.5	1.3	50%	1,560

Notes:

¹ The emission factor for abrasive blasting using copper ore slag was assumed to be only 10% of the emission factor in AP-42 Table 13.2.6-1, which is for abrasive blasting using sand.

² Since the source uses wet abrasive blasting, a 50% control efficiency was conservatively assumed. AP-42 states the control efficiency for wet abrasive blasting can range from 50-93%.

³ It was assumed that the emissions from blasting concrete substrates are comparable to the emission from abrasive blasting with sand.

Total abrasive blasting emissions:

Particle Size	Emissions (lbs /yr)
PM	35,640
PM₁₀	17,160
PM_{2.5}	1,716



NON-TITLE V COMPLETENESS DETERMINATION CHECKLIST

Items 1-15 Front page: Items 1 to 15 (14 for Renewals) must be completed.

Notes to engineer:

- *For renewal applications the source must either answer 'No' to questions 2-5 or submit an application for a permit modification.*
- *Item 8: Many applicants do not know the SIC code or NAICS code for their industry. For a new application the code can be obtained by doing an on-line search. <http://www.osha.gov/pls/imis/sicsearch.html>*
- *Items 5, 7 and 14: These may be the same for many applicants.*

Complete: Incomplete:

Item 16: A simple site diagram has been included, preferably on a standard size paper. Detailed blueprints or construction drawings are not required.

Complete: Incomplete: N/A:

Item 17: A simple process flow diagram on a standard size paper is preferred. A process flow diagram may not be needed for some small businesses.

Complete: Incomplete: N/A:

Item 18: An O&M plan is required only for a control device. An O&M plan is not required for a spray booth. Instead of including the O&M plan with the application, an applicant may submit it after receiving the permit.

Complete: Incomplete: N/A:

Item 19: A dust control plan, if required, must accompany the permit application. The plan will be reviewed and approved by the dust compliance group.

Complete: Incomplete: N/A:

Item 20: The applicant needs to complete only those sections of the permit application that are applicable.

Complete: Incomplete: N/A:

Notes to engineer:

- *Concerning Section Z: Many applicants will not be able to perform these engineering calculations. We will accept the permit application with a blank Section Z.*

Instructions for completing Sections A, B, C, D, E-1, E-2, F, G, H, I, J, K-1, K-2, K-3, K-4, L, M, X-1, X-2, Y and Z of the permit application are included at the beginning of each section and are self-explanatory.

In general, a material safety data sheet (MSDS) is required for each chemical used, stored or processed at the facility. Exceptions are for very common materials, such as gasoline, diesel, acetone, etc.

Business name: **Tpac, An En Con Company**

Permit number: **010182**

Completeness review completed.

Application determined to be: Complete: Incomplete:

Permit Engineer: **Lizabeth Gomez** Date: **03/04/2016**