

**Arizona Department of Environmental Quality
Technical Review and the Evaluation of the
Application for Air Quality Permit Number 48314**

I. INTRODUCTION

This Class II permit is for the operation of fluorination reactors, alumina scrubbing towers, vacuum pumps and a fluorine cell at the Fluoro-Seal site in Yuma, Arizona.

A. Company Information

Mailing Address: Fluoro-Seal International
16360 Park 10 Place, Suite #325
Houston, TX 77084

Facility Address: Fluoro-Seal International
7211 E. 30th Street, Suite A
Yuma, AZ 85365

B. Attainment Classification

(Source: 40 CFR 81.303)

The source is located in an area that is designated attainment/unclassified for the following criteria pollutants: nitrogen dioxide (NO₂), sulfur dioxide (SO₂), carbon monoxide (CO), lead (Pb), and ozone (O₃)

The source is located in an area that is designated nonattainment for particulate matter less than 10 microns in diameter (PM₁₀).

II. FACILITY DESCRIPTION

The site operates a fluorination reactor system to chemically treat plastic containers, which improves the barrier properties of the containers. The process enables the storage of aggressive chemicals such as gasoline, agricultural products, and solvents in the treated containers.

A. Process Description

A batch load of containers is placed into a reactor. They are then exposed to fluorine gas for a specific period. The reactor is then evacuated, with the exhaust gas routed through alumina scrubbers to remove hydrogen fluoride from the emission stream. The emission stream is monitored using a hydrogen fluoride detector.

B. Air Pollution Control Equipment

1. Each reactor train is controlled by two, in-series, alumina towers to reduce hydrogen fluoride emissions.
2. The cylinder storage area and fluorine cell are also controlled by alumina towers.

III. EMISSIONS

The facility has the uncontrolled potential to emit 4.73 tons per year of hydrogen fluoride. The facility operates two alumina scrubbers in series on each reactor line. Considering the first alumina tower has a 99.9% efficiency and the second is 99% efficient, the controlled potential to emit is 0.019 tons per year of hydrogen fluoride. Since the reactors are the only emission sources at the facility, there are no emissions of other pollutants.

IV. LEARNING SITES POLICY

In accordance with ADEQ's Environmental Permits and Approvals Near Learning Sites Policy, the Department conducted an evaluation to determine if any nearby learning sites would be adversely impacted by the Fluoro-Seal, Yuma facility. Learning sites consist of all existing public schools, charter schools and private schools at the K-12 level, and all planned sites for schools approved by the Arizona School Facilities Board at the time of permit issuance (or approval). The learning sites policy was established to ensure that the protection of children at learning sites is considered before a permit approval is issued by ADEQ

The Department has identified 6 learning sites within two miles of the facility, as identified in Table 1. ADEQ reviewed the numerical modeling of the emissions from the facility to determine how they might impact these learning sites under even the worst case conditions. ADEQ then compared the results of the modeling analysis to air quality standards and relevant guidelines established to be protective of human health. The results of the modeling demonstrate that the air emissions from the facility will be well below these standards. As a result, ADEQ has determined that the operation of the facility will not adversely affect the learning sites.

Table 1 - Learning Sites in a two mile radius of the facility

Site	IMPACTED LEARNING SITE
1.	ARIZONA WESTERN COLLEGE
2.	SOUTHWESTERN CHRISTIAN SCHOOL
3.	MARY A OTONDO ELEMENTARY SCHOOL
4.	DESERT MESA ELEMENTARY SCHOOL
5.	CASTLE DOME MIDDLE SCHOOL
6.	GILA RIDGE HIGH SCHOOL

V. APPLICABLE REGULATIONS

The applicable regulations listed in Table 2 below were identified by the Department. The source is required to list any additional regulations that may be applicable.

Table 2: Verification of Applicable Regulations

Unit	Control Device	Rule	Verification
Fluorination Process	Alumina Towers	A.A.C. R18-2-730 A.A.C. R18-2-702	These standards apply to unclassified sources.
Fugitive Dust Sources	Water and other equivalent controls	A.A.C. R18-2-602 A.A.C. R18-2-604 A.A.C. R18-2-605 A.A.C. R18-2-606 A.A.C. R18-2-607 A.A.C. R18-2-614 A.A.C. R18-2-702	These standards are applicable to all fugitive dust sources.
Other Periodic Activities	Particulate matter control, proper selection of approved paint materials, hazardous air pollutant control	A.A.C. R18-2-702.B.1 A.A.C. R18-2-726 A.A.C. R18-2-1101.A.8	These standards are applicable to all periodic activities including abrasive blasting, use of paints and demolition/renovation of asbestos-containing buildings.

VI. MONITORING REQUIREMENTS

The Permittee is required to operate and maintain a hydrogen fluoride emissions monitor in the facility stack to measure emissions. In addition, the facility is required to implement and maintain a fluorine leak detection program.

VII. AMBIENT AIR IMPACT ANALYSIS

A. Introduction

ADEQ completed a modeling analysis to determine whether the air quality impacts from the facility will cause or contribute to a violation of any air quality standard, or worsen an existing air quality problem.

B. Modeling Analysis Overview

1. Air Quality Model

The dispersion modeling analysis was run using the EPA approved SCREEN3 modeling program. The SCREEN3 model was run using screening meteorology,

rural dispersion coefficients, and flat terrain. The modeling for this source is based on an operating schedule of 8,760 hours per year.

SCREEN3 is a steady state, single source, Gaussian dispersion model developed to provide an easy to use method of obtaining pollutant concentration estimates. SCREEN3 is an EPA approved screening model for estimating impacts at receptors located in simple terrain and complex terrain due to emissions from simple sources. The model is capable of calculating downwind ground level concentrations due to point, area, and volume sources. In addition, SCREEN3 incorporates algorithms for the simulation of aerodynamic downwash induced by buildings.

2. Modeled Emissions

The modeling results in Table 3 show that the emissions will not exceed any health based standards.

Table 3: Modeling Results

Pollutant	Total	Standard (mg/m³)	% of Standard
HF – Acute	0.157	9.8	1.6
HF – Chronic	0.01256	0.0146	86.03

VIII. LIST OF ABBREVIATIONS

A.A.C.	Arizona Administrative Code
ADEQ	Arizona Department of Environmental Quality
EPA	Environmental Protection Agency
HAP	Hazardous Air Pollutant(s)
HF	Hydrogen Fluoride
hr	hour(s)
lb	pound(s)
lb/hr	pound(s) per hour
PTE	potential-to-emit
tpy	ton(s) per year
mg/m ³	milligram(s) per cubic meter