



LUKE ZHU, P.E. MANAGING CONSULTANT

CREDENTIALS

- ◆ B.S. Chemical Engineering, Cornell University, 2012
- ◆ M.Eng. Environmental Engineering, Cornell University, 2014
- ◆ Professional Engineer, NY 2025

PROFESSIONAL EXPERIENCE

- ◆ 2020 – Present: ALL4, Philadelphia, PA – Managing Consultant
- ◆ 2019 – 2020 Environmental Strategy Consultants Inc., Philadelphia, PA – Environmental Engineer
- ◆ 2014 – 2019 Air Management Services, Philadelphia, PA – Environmental Engineer

TECHNICAL EXPERTISE

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| ✓ Environmental compliance strategy | ✓ Philadelphia air permitting and compliance |
| ✓ Air emissions statements and calculations | ✓ PA, NJ, OH, IN, FL, DE regulations |
| ✓ Air compliance auditing | ✓ Title V and minor source air permitting |
| ✓ Method 9 opacity monitoring | ✓ NSPS, NESHAP |
| ✓ PPC, SPCC, SWPPP | ✓ TRI, EPCRA |
| ✓ NPDES | ✓ NJ risk assessment screening |
| ✓ Hazardous and residual waste reporting | ✓ Greenhouse Gas Reporting (Subpart C) |
| ✓ Tier II/CRTK/ERP | ✓ NJDEP Radius |
| ✓ Enablon | |

PROFESSIONAL OVERVIEW

Luke Zhu is a Managing Consultant at ALL4 with over ten years of experience in air permitting and compliance. He has supported industries including metal working, pharmaceuticals, wood/metal coating, chemical manufacturing and distribution, food/beverage, and wastewater treatment across Pennsylvania, New Jersey, Delaware, Ohio, Maryland, Missouri, and Montana. Luke has experience in air quality applicability assessments in NSPS, NESHAP, Greenhouse gas monitoring, NSR, PSD, and other Federal, state, and local regulations. He has worked with clients directly and has supported projects in developing environmental compliance tracking, emissions tracking, regulatory analyses, periodic reports, and permit applications. Luke's multimedia environmental experience consists of developing facility emergency and contingency plans (PPC, SPCC, ERP), developing NPDES applications, and reporting (EPCRA Tier II, residual waste, hazardous waste, IDMR, TRI, RPPR).

Luke joined ALL4 after 1 year of experience in multimedia environmental consulting upon ALL4's acquisition of Environmental Strategy Consultants, Inc. (ESC). Prior to consulting, Luke has five years of professional experience in air permitting, compliance, and enforcement with Philadelphia Air Management Services (AMS). He has experience in writing installation permits, plan approvals, and operating permits; conducting full compliance audits of Title V and minor sources in Philadelphia County; reviewing compliance reports and emission inventories; identifying compliance issues; issuing notices of violation; and carrying out enforcement of compliance issues and violations.



AIR QUALITY PERMITTING EXPERIENCE

Project Manager for a renewable fuel feasibility assessment for a Facility in PA, Managing Consultant: I acted as project manager for a project to assess the feasibility of switching a facility's usage of natural gas and diesel combustion (mainly consisting of large boilers and combustion turbines) to biodiesel fuel in effort to reduce net greenhouse gas production. I managed a team of technical staff, including a professional engineer, to review the proposed project's applicability to NSR, NSPS, and NESHAP and determined two scenarios of permissible fuel usage considering permitting implications (e.g., to avoid PSD permitting or to adhere to existing fuel usage limits). I delivered our findings to the client verbally and as a written memorandum to inform their decisions in pursuing the potential fuel switch.

Project Manager for Numerous Corrugated Sheet Manufacturing Facilities in OH, Consulting Engineer: I managed a team of technical staff to prepare construction permit applications for the facilities including preparing potential-to-emit calculations using newly published emissions studies conducted on corrugation processes. I verified the technical team's findings of regulatory applicability to Ohio Administrative Code (OAC) Chapter 3745, provided guidance to the facility as to the proper air permits to obtain for the site's activities and direct ALL4's modeling technical team to prepare AERSCREEN modeling of air toxics emissions from the site. I guided the team's development of the air permit application and delivered the final product to the client.

Lead Technical Engineer for a fumigation process installation permit application in Philadelphia PA, Consulting Engineer: I acted as lead technical engineer in the development of an installation permit application for a fumigation process located in Philadelphia, PA. I attended preapplication meetings with Philadelphia's Air Management Services to explain the proposed project to the agency and determine the proper air permitting path for the project. I prepared initial air toxics risk screening evaluations of the site's emissions to ensure compliance with Philadelphia Air Management Regulations (AMR) VI. I provided the necessary parameters to ALL4's air quality modeling team who prepared AERMOD dispersion modeling of the facility's fumigation operations and prepared the air permitting application for the client.

Lead Engineer for applicability analyses and modification applications for RACT III in PA, Consulting Engineer: I prepared applicability analyses and modification applications to Title V permits with regards to the newly promulgated RACT III rule at 25 Pa. Code 129.111-115 for multiple facilities in Pennsylvania. Reviewed RBLC search results for applicable emissions sources to reasonably determine what control technology is feasible for each source. Prepared potential to emit emissions calculations and reviewed facility records to come up with the list of sources that are subject to alternative RACT, to presumptive RACT requirements, or are exempt from RACT. Advised the facilities of our findings and prepared appropriate permit applications to incorporate these RACT requirements into existing air permits through a significant modification application.



Lead Developer for a Title V Operating Permit Renewal Application for a Pharmaceutical Manufacturing Facility in PA, Project Engineer: I took a lead role in developing a Title V operating permit (TVOP) renewal application for a major facility in Pennsylvania. I guided a small team of engineers in developing and quality-assuring project deliverables for this project including a major overhaul to the facility's TVOP that would simplify and consolidate the facility's 100+ significant sources. I also developed a matrix of source information for the application that condensed potentially hundreds of pages of application forms down to four pages.

Lead Developer for a New Natural Minor Operating Permit Application for a Manufacturing Facility, PA, Project Engineer: I was main developer for an operating permit application for a roofing material manufacturing facility in Pennsylvania. I developed and coordinated QA, senior review, and ALL4 quality professional review for the application packaging consisting of application narrative, forms, figures, emissions, and appendices. We received minimal comments from PADEP on the application.

Drafter of Natural Minor and Synthetic Minor Operating Permits, Philadelphia, PA, Permit Engineer: At AMS, I drafted operating permits in variety of industries such as hospitals, data centers, manufacturing facilities, and college campuses. I would review the permit applications received, determine whether the applications are administratively complete, review regulations relevant to the industry, conduct inspections of the equipment listed in the applications, and coordinate with PADEP to ensure the application enters the public notice period, and work with the Chief of Source Registration to issue the final permits.

OTHER TYPES OF *EXPERIENCE*

Project Manager for Facility Transfer of Ownership in NJ, Consulting Engineer: I reviewed the transaction's applicability to New Jersey's Industrial Site Recovery Act (ISRA (N.J.S.A. 13:1K and N.J.A.C. 7:26B)). I coordinated with an ALL4 professional engineer to subcontract a Licensed Site Remediation Professional (LSRP) for them to conduct a site assessment. I reviewed the findings report from the LSRP and ensured that the transaction is occurring in compliance with NJ ISRA regulations.

Technical Lead for Numerous Annual and Biennial Reporting Projects for Facilities in NJ and PA, Project Engineer: I was a technical lead during the 2021 reporting season overseeing Tier II, residual waste, hazardous waste, Community Right-to-Know, state-only and Federal air compliance submissions for over a dozen clients. I mentored and conducted junior technical staff to prepare the analyses and performed technical support and review. I was also the main point-of-contact for many clients. The reports prepared received minimal comments from the respective project managers and were submitted on time.



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Lead Developing SPCC Plan, MO, Project Engineer: I conducted a site visit as an agent of a licensed PE of a new data center facility under construction. I observed site conditions, surveyed oil storage containers, and conveyed all information back to the PE for incorporation into a new SPCC Plan. I prepared facility's initial SPCC Plan in accordance with 40 CFR Part 112. As part of facility support, I also reviewed applicability of the site's emergency generators to Missouri State Rule 10 CSR 10-6.060 and determined that the emissions units are exempt from air permitting. I prepared the notice to the MO DNR who confirmed the exemption.

Developing SPCC Plan, NJ, Project Engineer: I was lead developer for a 5-year update to an SPCC Plan for a facility in New Jersey. The project consisted of a site visit and walkthrough with a Professional Engineer to assess oil storage and the status of the building envelope as oil containment. I exchanged email and phone communications with the client on information exchanges for the plan and transmitted recommendations from the Professional Engineer back to the client. I developed the SPCC Plan and coordinated QA and senior review efforts.

Facilitating Implementation of New Cloud Based Software at AMS, PA, Environmental Engineer: In 2015, AMS transitioned to a new cloud-based software, CitizenServe, that would house the agency's permits, applications, inspection files, licenses, violations, and more. Unfortunately, due to the complexity and the rather unintuitive layout of the software, it was difficult for many to properly utilize it to full potential. I was tasked to act as liaison between us end users at our agency and CitizenServe support. I would take requests and complaints from my peers submit them in language that would facilitate the troubleshooting process for the developers helping us. I would also attempt to duplicate bugs that my peers would experience to help diagnose the issues they face. Once I gained enough knowledge of the platform, I was able to resolve some of my peers' issues on my own.