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Yale Occupational and Environmental Medicine Program

Evaluation of Timothy Dwight Elementary School

Executive Summary

The Yale Occupational and Environmental Medicine Program (YOEMP) was asked to help address concerns regarding the indoor air quality (IAQ) and environmental conditions at the Timothy Dwight (TD) Elementary School and potential health effects. To address these concerns, YOEMP reviewed prior IAQ reports and related documents, performed 2 site visits of the school (including meeting with a limited number of staff and parents), and administered a voluntary anonymous online survey to parents and teachers / staff. We presented our initial findings to parents, teachers / staff, and administration on June 6, 2025. This report summarizes our findings and recommendations.

The school, a 60+ year-old structure, was generally found well-maintained with no signs of mold, water damage, or structural issues at the time of our visits. However, several issues that can impact IAQ and well-being were noted. These included limited fresh air intake and air conditioning in many areas of the school, inability to adequately control temperature and relative humidity, and issues with the on-site sewage / septic system.

The anonymous online survey was administered to 315 parents and 35 staff, with 44 parents (14%) and 12 teachers/staff (34%) responding. Parents and teachers / staff reported similar concerns regarding the school environment and similar health issues. The most commonly reported concerns were too hot / humid (89%), insufficient ventilation (75%), and strong odors (61%). In response to which rooms had environmental concerns, just about every room in the school was reported. Common health concerns reported included allergies, asthma, rhinitis / sinusitis, and respiratory infections, with many reporting improvements when away from the school and worsening at the school.

Based on our findings regarding the school environment, YOEMP recommends the following:

- Expand cooling throughout the building (recognized by the district but reportedly on hold due to lack of electrical power capacity)
- Ensure longer-term building plans include modern air handling units. In the interim, keep windows open when weather conditions permit.
- Further investigate persistent sewage odors and consider approaches to minimize them
- Perform longer-duration monitoring for temperature, relative humidity, and carbon dioxide in multiple rooms throughout the school to guide and prioritize IAQ interventions
- Regularly inspect and HEPA vacuum all HVAC diffusers
- Ensure rugs are similarly HEPA-vacuumed
- Disable the ionizing feature on portable air purifiers
- Discontinue use of the evaporative cooler in Faculty Room
- Inspect exterior doors, frames, and thresholds for rust and other signs of weather intrusion (upgrade floor sweeps / gasketing)
- In Classroom 14, reposition the AC condensate drain to increase flow.

YOEMP Evaluation

An initial site visit was conducted on March 5, 2025, during which time the Yale team met with representatives of the teaching staff, school personnel, and parents, and a walk-through of the school facility was performed, including an inspection of all rooms in the building. A follow-up visit was performed on March 10, 2025 to access and view the roof and the building exterior envelope. In addition, we reviewed available documentation related to the school, including previous IAQ assessments. To better understand concerns regarding exposures at TD and potentially related health problems, an anonymous survey was disseminated to parents and teachers / staff. This report presents a summary of the findings from the site visits, review of available documents, the survey results, and offers recommendations. Background information on exposures in indoor environments such as schools and the impact of inadequate IAQ is also briefly presented.

Determinants of Indoor Air Quality

Given how much time most people spend indoors there is an expanding medical literature characterizing indoor exposures and the impact of the indoor environment on health and well-being. IAQ and the overall indoor environment depend on multiple factors, including numerous potential indoor sources of exposure, ventilation, heating and cooling systems, outdoor air quality and the amount of outdoor air entering the building, temperature, humidity, and school occupancy and activities. Potential Indoor sources of exposure include dusts, particulates, cleaning products, personal care products, indoor allergens (mice, pets), bioaerosols (fungi / mold), and off-gassing of volatile organic compounds (VOCs) from building materials, furniture and educational materials (art supplies, books, etc.). High humidity, moisture and warmer temperatures can promote mold growth and accentuate odors, and indoor air contaminants can accumulate in tighter, more energy efficient buildings, such as after installation of more airtight windows. Improving ventilation, increasing fresh air intake and fixing sources of water intrusion (e.g. leaking pipes or roof) reduces the levels of these indoor exposures.

Outdoor air also contains contaminants, such as particulate matter (PM), ozone, seasonal allergens, and if near specific sources, highway or industrial pollutants, or in the case of the TD School, septic odors. During outdoor exposure events, such as fires, pollen season, or strong septic odors, outdoor exposures can persist indoors.

Improving building ventilation and reducing sources of exposure (indoor and outdoor) will improve IAQ. Filters and air purifiers can also be helpful.

Impact of Indoor Air Quality and Environment on Health and Well-being

The most common health problems associated with indoor exposures are upper airway and respiratory effects, including allergies, eye irritation, nasal and sinus congestion, rhinitis and asthmatic symptoms. Headaches, respiratory infections and rashes can also occur. Building associated symptoms such as eye irritation, cough, nasal / sinus congestion and chest tightness can be variable, depending on building conditions. Such symptoms typically improve when away from the building and worsen when back in the building. Extremes of temperature and relative humidity can further exacerbate indoor air-related problems. IAQ issues and extreme temperature and humidity have also been shown to adversely impact school and work attendance and performance.

Of note, indoor exposures, while they can substantially impact health and well-being, do not increase the risk of chronic conditions such as cancer, autoimmune disorders, or neurologic, cardiac or liver disease.

Indoor Air Regulations

In the United States, there is no single federal law that regulates IAQ in schools and offices. However, several agencies, organizations and State health departments provide guidelines, standards, and enforcement authority for specific settings and contaminants:

- Occupational Safety and Health Administration (OSHA) sets enforceable exposure limits for a limited number of indoor air pollutants in the workplace, including carbon monoxide, formaldehyde, and asbestos.
- The Environmental Protection Agency (EPA) does not regulate indoor air directly but offers guidance on sources of indoor pollution, ventilation, and health effects through its “Indoor Air Quality Program.” It establishes ambient outdoor air quality standards for contaminants such as ozone and particulate matter.
- The EPA also oversees the Asbestos Hazard Emergency Response Act (AHERA) which requires K to 12 schools to identify and manage asbestos-containing building materials in school buildings.

- The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) develops voluntary standards, including Standard 62.1 and 62.2, which provide widely used benchmarks for ventilation and acceptable IAQ in commercial and residential buildings.
- State and local governments may implement building codes and provide public health guidance and/or regulations addressing specific IAQ concerns, such as mold or radon. For example, the CT Department of Public Health (CT DPH) mandates periodic testing for radon in all CT schools.

Thus, IAQ is influenced by a combination of occupational regulations, public health guidance, and voluntary recommended standards. Tests commonly used to assess IAQ include air sampling for fungi, CO2, total VOCs, PM, temperature and relative humidity (RH). Indoor levels of fungi are generally compared to outside levels, with higher levels indoors suggesting a problem with dampness and moisture.

Carbon dioxide (CO2), a gas that people exhale, is frequently used to assess ventilation and fresh air rates in rooms that are occupied, with higher levels indicating less adequate ventilation. Typical outdoor CO2 levels are around 300-400 ppm. Indoor CO2 levels are generally considered acceptable if they are below about 1,000 ppm. Interpretation of CO2 levels also requires information about room occupancy and use.

Indoor relative humidity levels of less than 60% are generally considered appropriate and limit the potential for mold growth, and temperatures ranging from around 67 – 79 F are generally considered acceptable for comfort, with the caveat that higher humidity levels, as is common in CT in warmer months, require lower temperatures to maintain comfort.

Of note, the US EPA, CDC, and CT Department of Public Health (CT DPH) do not recommend air sampling and analysis, such as for mold and VOCs, as a first step for evaluating IAQ, with the CT DPH stating that "*The results of indoor air testing rarely provide the information needed to solve the problem.*"

Since most IAQ testing is performed at a single point in time in a limited number of locations, it typically quantifies only a small fraction of airborne exposures and may not be representative of different areas of the building. In addition, there is substantial variability in human responses to temperature, humidity and exposures. Symptoms associated with a given environment warrant attention and should not be dismissed because airborne mold or other testing results are noted to be "normal". In most settings, temperature, relative humidity and CO2, which can now be continuously monitored and data-logged with low-cost monitors, are the most useful parameters to monitor (and can make great science projects for students).

Summary of Recent Environmental Monitoring and Assessments at Timothy Dwight Elementary School

In late 2024, the environmental consulting firm TRC performed a set of IAQ assessments, the first in November on a limited number of spaces and then a comprehensive survey throughout the building in December.

The assessment in November focused on Room 18 (a classroom) due to concerns, and used Room 19, the hallway, and outdoors for comparisons. A leaking sink and a slight musty odor were noted in Room 18. Testing results for fungal spores and CO_2 were unremarkable. TRC recommended repairs to the leaking sink in Room 18, and then cleaning/disinfecting and repainting the stained area. They also recommended replacing the stained ceiling tile in the Room 18 toilet room, and cleaning HVAC system diffusers and the filter on the wall-mounted split AC system.

A month later, in December 2024, TRC conducted a building-wide assessment, collecting measurements and observations (including temperature, humidity, CO2, fungi) throughout the school. They confirmed that the November recommendations had been acted upon, including removing the split AC system blower unit from Room 18. The TRC consultants reported no odors, staining, or visible mold growth, and the tested parameters were considered within normal ranges, except for relative humidity levels which were low (reflecting dry outdoor weather conditions). The measurements were collected on school days in December after students had left, making conclusions about conditions while school was in session or under different weather conditions difficult. The investigators again recommended periodic cleaning of HVAC system diffusers and split AC system filters, performing preventive maintenance on all such equipment, and to consider increasing relative humidity in the winter. (The latter is something YOEMP urges caution with to avoid creating excessive indoor moisture).

IAQ testing had also been performed earlier, in 2018, by Woodard & Curran, another regional environmental consulting firm. That work focused on a subset of rooms (Rooms 8, 10, 15, 17), the interior of their walls, and

portions of the roof above these spaces. Suspect fungal growth was detected on a small section of the wall behind wood trim in Room 17, which was subsequently disinfected and repainted by school staff. Bioaerosol measurements found higher airborne mold levels outdoors than indoors, with Room 17 among the lower values.

Assessments have also been performed for radon and asbestos, in compliance with EPA (AHERA) and State CT regulations. Radon testing is required every 5 years, most recently in 2022. Like the prior measurements in 2018, the 2022 values were all very low, far below the 4.0 pCi/L action limit established by the EPA. Like most schools and commercial buildings constructed prior to the 1980s, TD was built with some asbestos containing materials. As required by AHERA, the school has been inspected for asbestos and maintains an asbestos management plan. When repair or renovation work may involve suspect asbestos containing materials, samples are collected and tested, and abatement performed prior to the work. Special work practices are also in place for maintaining and protecting floor tiles (primarily the 9" x 9" style) that contain low levels of asbestos.

Although not an indoor environmental test per se, a building-wide engineering and recommissioning study of the existing ventilation systems was performed in 2022. The work identified that only a subset of rooms has ducted ventilation systems (Main Office, Multipurpose Room, Library/Media Center, Kitchen, Gym), while the remaining spaces (including all classrooms) only receive outdoor air that infiltrates through windows and exhaust fans. The consultants identified repairs needed to existing equipment and concluded that the building's original "dedicated outdoor air system" was not working properly, required repairs, and that the building had inadequate means to provide outdoor fresh air or to filter air. They identified portable air purifiers as a temporary measure, and recommended upgrades to provide modern, code-compliant ventilation.

Site Visit Observations

Construction

The Dwight School was constructed approximately 60 years ago, in a style common for its time. It is a single-story U-shaped structure on a sloped site. The exterior was constructed from concrete masonry units (CMU or "block") and brick, with curtain wall exterior windows and door assemblies. The building has a built-up flat roof. Interior walls throughout the school are a mix of painted CMU and brick, painted sheetrock, fiberboard, and wood. Flooring in hallways, classrooms, and most other spaces are 9" x 9" and 12" x 12" floor tiles, with the smaller sized ones being older and presumed to be traditional asbestos vinyl floor tiles. Restrooms have tiled or painted sheetrock walls, while the gym has finished wood flooring. Small area rugs were common in classrooms, typically near front-of-class whiteboards. Overall, the interior and exterior of the building were observed to be in very good condition, with no odors, stains, or visible suspected mold detected.

Ventilation / Heating / Cooling

The original building was constructed with a "dedicated outdoor air system", designed to exhaust air with make-up air provided via windows and passive infiltration to provide fresh air; more recent energy conservation improvements to windows have reduced infiltration of outside air. The school is heated by perimeter radiators (forced hot water) fed by a main boiler room (gas-fired with oil back-up). As noted earlier, only a small subset of spaces has ducted HVAC systems that provide cooling.

Approximately half of the classrooms have local air conditioning, provided by non-ducted "split systems" where the compressor is located outdoors, and the fan coil and blower unit are mounted on walls indoors. The louvers on some units were found dirty. Portable window-style air conditioners were only observed in the Faculty Room.

Portable air purifiers were found in most rooms, including all classrooms (Aeramax Pro Am 3). This make/ model of air purifier relies upon internal filtration but also has an "ionizer", a feature that can generate ozone, a well-recognized respiratory irritant. While this model is listed by the California Air Resources Board as a Certified Air Cleaning Device, the certification only assures that the device at the time of testing produces < 50 ppb ozone.

Water and Septic System

The building is served by city water but relies upon a large on-site septic system for sanitary waste. Due to the size and layout of the septic system, vents to atmosphere are located near the building and also on the hillside enroute to the leaching field. We detected sewage odors outdoors adjacent to the Multipurpose Room between our meetings with parents and faculty on June 6, 2025.

Potential Dampness / Mold

Custodial and maintenance staff identified a history of limited water infiltration, primarily between a few classrooms, from older plumbing drain-waste-vent stacks and a toilet drain backup. Repairs were reportedly made to these spaces, including those noted in the limited IAQ assessments described above.

Due to the sloped nature of the building site, the Media Room is partially below grade along the exterior wall of the north courtyard, which reportedly results in periodic dampness, for which a portable dehumidifier is used. At the time of our visits, we detected none of the odors commonly associated with indoor mold/mildew and wetness, including in the Media Room and the lower-level boiler room. We also observed no stained ceiled tiles in any space, floor tiles were found intact and well-maintained/waxed, and walls showed no evidence of buckling, peeling, or blistered paint, or staining suggestive of past ceiling leaks.

The roof was also found in very good visual condition, with a warranty that reportedly includes an allowance for preventive maintenance. Air handling units and penetrations for drain-waste-vent stacks appeared to be well flashed, and no standing water was observed despite recent rains before that visit.

However, the lower portion of exterior doors and their frames in a small number of classrooms showed minor rusting, indicating a need to improve weatherstripping and gasketing, but otherwise, no evidence of significant rain or snow infiltration or flooding was observed. A small number of exterior wall locations (primarily by the Kitchen Storage area and outside Classroom 14) may require minor brick repointing in the future.

Cleaning

Cleaning is performed by in-house custodial staff. Dwight has adopted the *Tools for Schools* program and reported only procuring cleaning and maintenance products approved by the CT Department of Education. Records of inspections and work efforts under the *Tools for Schools* were reviewed and found current and in active use. Vacuum cleaners used for rugs and other soft surfaces are Proteam brand upright and backpack style vacuums (ProGear and ProGen), which reportedly rely upon HEPA filtration.

Survey Results

The Yale Institutional Review Board (IRB) determined that the project did not meet the criteria for human subject research and was exempt from IRB review. The anonymous online survey was administered to 315 parents and 35 staff. Fifty-six individuals completed the online survey, 44 (14%) parents and 12 (34%) teachers/ staff, as shown in Table 1. Parents from all elementary grade levels participated. Amongst school personnel who participated, 67% were teachers and 33% were school administrators / staff. Most (83%) were full-time long-term employees, with 50% employed at TD for > 10 years. As the survey results from parents and school staff were generally similar, the tables present the combined findings from both groups, except for health issues.

Table 1: Survey Respondents (n = 56)	
Role	n (%)
Parents of students	44 (79%)
Teachers/Staff	12 (21%)
Teachers	8 (67%)
School Administrators or staff	4 (33%)
Student Educational Levels (n = 57)	
Kindergarten	11 (19%)
Grade 1	11 (19%)
Grade 2	10 (18%)
Grade 3	14 (25%)
Grade 4	4 (7%)
Grade 5	7 (12%)
Hours Worked by Teachers/Staff (n = 12)	
Part time	2 (17%)
Full-time	10 (83%)
Length of Employment by Teachers/Staff (n = 12)	
< 1 year	1 (8%)
5 years – 10 years	5 (42%)
> 10 years	6 (50%)

Environmental Conditions Reported by Parents and Teachers / Staff

Table 2a summarizes the environmental conditions reported. The most commonly reported concerns were hot and humid conditions, insufficient ventilation/stale air, and strong odors, which from conversations with parents and staff are primarily related sewage / septic related odors. In response to a query regarding other environmental concerns, sewage problem was the most common write-in response, noted by 5 of 13 write-in responders.

Table 2a. Environmental Conditions Reported at TD Elementary School (n = 56)	
Too Hot / Humid	50 (89%)
Insufficient Ventilation, Stale Air	42 (75%)
Strong Odor	34 (61%)
Mold, Mildew	28 (50%)
Too Cold	21 (38%)
Rodent, Pest, Animal Problems	12 (21%)
Other Complaints or Observations (from write in comments)	13 (23%)
Sewage Problem/Smell	5 (9%)
Perceived Allergen or Irritant	3 (5%)
Poor Building Conditions	1 (2%)
Dampness	3 (5%)

The survey also assessed the extent /duration of each exposure, ranging from infrequent (< 1 week per year) to frequent (> 1 month per year), as shown in Table 2b. For the commonly reported exposures, including heat/humidity, insufficient ventilation, strong odors, and mold, over 70% of those who reported the exposure noted that it was present for over 1 month per year, as shown in Table 2b.

Table 2b. Duration of Exposure to Environmental Conditions at the School (n = 56)	
Too Hot, Humid (n=50)	
< 1 week per year	2 (4%)
1 week to 1 month per year	10 (20%)
> 1 month per year	36 (72%)
Insufficient Ventilation, Stale Air (n=41)	
< 1 week per year	1 (2%)
1 week to 1 month per year	7 (17%)
> 1 month per year	33 (81%)
Strong Odor (n=34)	
< 1 week per year	2 (6%)
1 week to 1 month per year	6 (18%)
> 1 month per year	26 (77%)
Mildew, Mold (n=28)_	
< 1 week per year	3 (11%)
1 week to 1 month per year	2 (7%)
> 1 month per year	23 (82%)
Too Cold (n=21)	
1 week to 1 month per year	4 (19%)
> 1 month per year	17 (81%)
Rodents, Pests (n=12)	
< 1 week per year	4 (33%)
1 week to 1 month per year	3 (25%)
> 1 month per year	5 (42%)
Other Complaints/Observations (n=13)	
> 1 month per year	13 (100%)

Reported Health Conditions by Parents and Teachers / Staff

The most common health condition reported by parents regarding their children was environmental allergies. Respiratory issues, rhinitis / sinusitis, skin conditions, and asthma were also commonly reported by parents. School personnel also commonly reported environmental allergies, asthma and respiratory infections, similar to students, except skin issues were less common.

Table 3. Health Conditions Reported by Parents and Teachers/Staff		
Health Condition	**Students** (n = 57)	**Teachers/Staff** (n = 12)
Recurrent Resp Infections	12 (21%)	4 (33%)
Environmental Allergies	30 (53%)	6 (50%)
Recurrent Rhinitis/Sinusitis	9 (16%)	3 (25%)
Eczema, Skin Condition	11 (19%)	0
Heart Disease	0	1 (8%)
Asthma	10 (18%)	4 (33%)
Other Chronic/Persistent Conditions	8 (14%)	2 (17%)
Migraines	3 (5%)	1 (8%)
Respiratory problem (chronic cough)	2 (4%)	0
Nose bleeds	2 (4%)	0
Celiac disease /Unspecified	2 (4%)	0
Autoimmune disease	0	1 (8%)

Parents and teachers/staff were also asked if the reported health conditions were temporally related to being at the TD school, as summarized in Table 4. For all conditions, participants felt the health condition noted was worse when the child or teacher / staff was in school and improved when away from school.

Table 4. Health Condition Status: In School/At Work versus Away from School/Work		
Health Conditions	**At School**	**Away from School**
Recurrent Resp Infections	(n = 16)	(n = 16)
Worse	13 (81%)	1 (6%)
Same	3 (19%)	3 (19%)
Better	0	12 (75%)
Environmental Allergies	(n = 36)	(n = 36)
Worse	27 (75%)	1 (3%)
Same	9 (25%)	18 (50%)
Better	0	17 (47%)
Rhinitis/ Sinusitis	(n = 12)	(n = 12)
Worse	9 (75%)	1 (8%)
Same	3 (25%)	1 (8%)
Better	0	10 (83%)
Eczema, Skin Condition	(n = 11)	(n = 11)
Worse	8 (73%)	0
Same	3 (27%)	2 (18%)
Better	0	9 (82%)
Asthma	(n = 14)	(n = 14)
Worse	9 (64%)	1 (7%)
Same	5 (36%)	6 (43%)
Better	0	7 (50%)
Other Chronic/Persistent Conditions	(n = 10)	(n = 10)
Worse	8 (80%)	0
Same	2 (20%)	2 (20%)
Better	0	8 (80%)

School Locations of Concern

All areas in the school were noted by parents and teachers/staff to be of concern. These included instructional classrooms and common facilities such as the all-purpose room, gym, media center, and art room.

Table 5. School Locations of Concern for Poor Environmental Conditions (n = 56)	
All-Purpose Room	17 (30.4%)
Gymnasium	12 (21.4%)
Media Center	13 (23.2%)
Music Room	11 (19.6%)
Reading Room (Speech & Language)	7 (12.5%)
Waiting Room (Main Office, Principal's Office, Health Room)	10 (17.9%)
Room 1	7 (12.5%)
Room 2 (Art Room)	6 (10.7%)
Room 3	9 (16.1%)
Room 4	10 (17.9%)
Rooms 5, 6	8 (14.3%)
Rooms 7, 8	7 (12.5%)
Rooms 9, 10	8 (14.3%)
Rooms 11, 12, 13, 21	6 (10.7%)
Rooms 14, 15, 16,17	9 (16.1%)
Room 18	11 (19.6%)
Room 19	10 (17.9%)
Room 20	7 (12.5%)

Free-text Survey Comments

Twenty-five survey respondents (19 parents, 6 teachers/staff) provided written comments regarding other information and/or concerns. Most of these respondents voiced multiple concerns. Several themes, noted in Table 6, were apparent in these comments.

Table 6: Selected Survey Write-in Comments (n= 25)	
Survey Theme	**Selected Comments**
Poor ventilation and air quality	*"Lack of air conditioning and ventilation - increased irritability, exhaustion, influences ability to comprehend curriculum and focus…"* *"The classrooms get very hot and stuffy and impedes proper learning."*
Extreme indoor temperatures	*"My child says they cannot focus on hot days as they feel like they are melting."* *"Temps reached 90 degrees in September and June. They cannot learn when overheating."* *"Our daughter is incredibly hot in the warm months and cold in the winter. There is absolutely no fresh air or ventilation in the classrooms."*
Plumbing, septic, and odor problems	*"We all notice smells in the school….."* *"Septic is a concern."* *"The septic tank is always overflowing and the odor from the leeching field by the tennis courts can be smelled inside the building, the toilets frequently back up."* *"Odors from septic system outside can be smelled in the main office ……"*
Health impacts on school staff and students	*"…. kids are getting sick and being transferred out, and teachers are calling out sick frequently."*
Perceived lack of action and transparency	*"Despite all the tests, stagnant air persists…"* *"We need to acknowledge that there is a problem in order to deal with it…"*
Excessive moisture	*"In certain weather conditions, hallway floors/walls become wet and slippery so much so that adults and children have fallen."* *"In the warmer months, the hallways are visibly slippery due to condensation..."* *"Moisture on floors a concern."*

Conclusions and Recommendations

We found the school to be generally very well-maintained and in good condition, with none of the more common issues identified in many other older schools, such as evidence of roof leaks, water intrusions, and poorly maintained interior and exterior surfaces.

The building has limited ventilation with ducted fresh air, a condition that can exacerbate exposures to indoor pollutants. In addition, cooling / air-conditioning is insufficient or lacking in many spaces. Respiratory, upper airway and allergy-type symptoms were among the most common symptoms reported, consistent with inadequate ventilation and reduced IAQ. Potential specific sources of indoor exposures include septic system odors, past mold / dampness and everyday school and people-related exposures (such as art supplies, personal care products) that accumulate due to inadequate ventilation and fresh air intake.

Based on our site visits, survey responses, environmental observations, and review of past IAQ testing, we recommend the following actions to improve indoor air quality and reduce building-associated symptoms:

- Expand building-wide cooling capacity, a need already identified but reportedly delayed due to insufficient electrical infrastructure. In the short-run, if air conditioning is limited, consider use of dehumidifiers in non-air-conditioned rooms.
- Implement longer-term ventilation upgrades, including installation of modern air-handling systems. In the interim, open windows when weather conditions permit.
- Further investigate persistent sewage odors and consider approaches to minimize them, such as increasing the size of the exhaust fan on the stack outside the Multipurpose Room and using a vertical discharge rather than downward.
- Perform longer-duration indoor environmental monitoring in classrooms throughout the school using direct reading, datalogging instruments for temperature, relative humidity, and CO2 levels, while also keeping track of room usage (number of people, types of activities). Target goals are temperatures between 67 – 82 F, relative humidity levels of 65% or lower, and CO2 levels of no more than about 1,100 ppm (preferably lower). These results will help guide and prioritize IAQ interventions.
- Regularly inspect and HEPA-vacuum clean all HVAC diffusers and the split system blower filters to reduce dust and allergen accumulations.
- Inspect and ensure that all restrooms have functioning dedicated continuous exhaust ventilation.
- HEPA-vacuum all classroom rugs on a regular basis to reduce exposure to resuspended particles and allergens.
- Disable the ionizing feature on the portable air purifiers, as ionization can produce ozone and other reactive by-products.
- Discontinue use of the evaporative cooler in the Faculty Room, as it may contribute to excess humidity and microbial growth.
- Inspect and repair exterior doors and thresholds, focusing on signs of rust or water intrusion; upgrade floor sweeps and gasketing where needed.
- In Classroom 14, reposition the AC condensate drain to improve drainage and prevent moisture buildup.
- If the summer is very hot and humid, run air conditioners in advance of the return to school.

These actions are intended to improve the IAQ and indoor environment at TD Elementary School and healthier indoor environment and reduce environmental contributors to reported health concerns among students and school staff. YOEMP would be happy to review future environmental data collected.

Dr. Redlich and YOEMP physicians would be happy to evaluate any teachers/ staff and/or parents / students with specific concerns regarding potential exposures at TD or health concerns.

Sincerely

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Useful Online Resources regarding IAQ in Schools

EPA: Creating Healthy Indoor Air Quality in Schools
https://www.epa.gov/iaq-schools

State of CT: Indoor Air/Environmental Quality
https://portal.ct.gov/dph/environmental-health/environmental-and-occupational-health-assessment/indoor-environmental-quality--ieq

CDC-NIOSH Dampness and Mold Assessment Tool – School Buildings
https://www.cdc.gov/niosh/docs/2019-114/default.html

NEA: Addressing Indoor Air Quality in Schools
https://www.nea.org/resource-library/addressing-indoor-air-quality-schools