



Mark Parkinson, Governor
Roderick L. Bremby, Secretary

DEPARTMENT OF HEALTH
AND ENVIRONMENT

www.kdheks.gov

Division of Environment

May 24, 2010

To Whom It May Concern

Re: Final permit decision and responses to public comments on the application by APAC-KS, Inc. permit modification to the Construction and Demolition Waste Landfill, Permit # 0487, Johnson County, Kansas

Dear Sirs/Madams:

The Kansas Department of Health and Environment (KDHE) has issued a modified permit to APAC-Kansas, Inc. to allow continued operation of their active construction and demolition landfill located north of 167th Street between U.S. 69 Highway and Metcalf Avenue in Overland Park, Kansas. The modified permit contains numerous requirements intended to protect public health and safety including special operating practices related to the monitoring and control of landfill gases generated by the biodegradation of certain wastes.

- The modified permit and KDHE's responsiveness summary to public comments are attached to this letter and can also be viewed by going to the following link to the department's webpage: http://www.kdheks.gov/waste/p_pubnot_sw.html.

KDHE appreciates the participation by Kansas's citizens and others in the public comment process for the modification application.

Sincerely,

Ashok Samuel Sunderraj, PE, MS
Chief, Solid Waste Landfills Unit

Encl: Responsiveness summary to Public Comments
Distribution List
Permit with special and general conditions

cc: William Bider – Director, Bureau of Waste Management
Dennis Degner – Chief, Solid Waste Permits Section
Julie Coleman - District Environmental Administrator, Northeast



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Responses to Public Comments on the
Application by APAC-KS, Inc.
for a
Significant Modification/Expansion of the
Construction and Demolition Landfill
and
Source-Separated Organic Waste Composting Facility
in
Johnson County, Kansas
located at
7355 West 162nd Street,
Overland Park, Kansas
In the
Southeast quarter of Section 18, Township 14 South, Range 25 East
Permit No. 0487
May 10, 2010

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This document provides responses to public comments received by the Kansas Department of Health and Environment (KDHE) during the public notice period spanning December 17, 2009 to February 19, 2010. All individuals who submitted comments, or requested notification of the permit decision and responses, were notified about the availability of this document. This document does not address each individual comment, but combines representative comments and the associated responses into groups. **The comments are presented in italics and the responses to comments are provided in this standard type of font.**

OVERVIEW OF PERMIT MODIFICATION REQUEST

The site has been in continuous operation as a construction and demolition waste landfill (CDLF) since 1986 when it was permitted by KDHE. Regulations promulgated by KDHE in 2003, required all CDLFs to update facility design and operation plans. When updating the documents, the APAC-KS facility applied for a modification of the permit to expand the landfill waste disposal area from 50 acres to the current disposal area of approximately 82 acres, and to increase the final landfill elevation from 1,000 to 1,024-feet above mean sea level (MSL). The site is a former limestone quarry that allows contact water to be retained within the waste mass (see Figure 1).

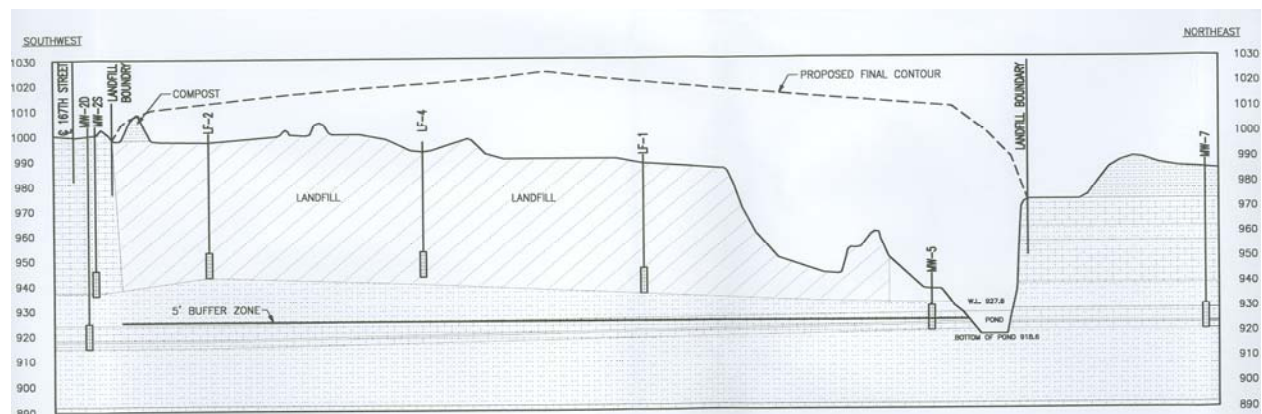


Figure 1. Cross-section of landfill showing requested 1024-foot final-cap elevation.

KDHE's PERMIT DECISION

On April 25, 2006, APAC-KS submitted to KDHE an application for modification of its Permit. On February 11, 2008, KDHE issued an amendment to Permit No. 0487 with sixteen Special Conditions. One of the Special Conditions required that the landfill cease taking construction and demolition waste on December 31, 2010, and that final cover construction on the landfill be finished by June 30, 2011. APAC-KS subsequently exercised its legal rights under the Solid Waste Act and appealed the amended Permit to the Office of Administrative Hearings. During the period of the appeal, APAC-KS and KDHE entered into an Interim Agreement and Final Order that required APAC-KS to design and implement various corrective measures to reduce risks to public health and the environment. Also during the appeal, KDHE analyzed and researched the impacts of APAC-KS remaining on-site at the landfill to implement all necessary measures to ensure that public health and safety were adequately protected. Over the past four years, with KDHE's oversight, APAC-Kansas has installed improved systems to monitor gas and

groundwater, to collect and treat gas and contact water, and to build redundancy into various environmental controls. At the present time, the system of controls at the landfill are adequately protecting public health as demonstrated by extensive ambient air monitoring results; however, those controls must be monitored closely and maintained properly in the future to ensure that no public health impacts occur. Over the past year, APAC-Kansas has demonstrated to KDHE that its ongoing presence and continued corrective action and monitoring at the landfill protect public health and safety as required by Kansas environmental laws and regulations.

KDHE has thoroughly reviewed all public comments received and carried out additional independent technical evaluations of the issues related to this site. This decision is supported by an extensive review (conducted by professional engineers and professional geologists) of recently available literature related to construction and demolition landfills and their potential to release hydrogen sulfide and methane gases as well as the potential health effects associated with such releases.

KDHE established multiple special permit conditions under which the landfill may continue to receive waste for disposal. APAC-Kansas will only be able to place wastes to achieve a final cap elevation that approximates the site's original topographic contours as defined by the revised permit's special condition number 1. This permit modification requires closure of the site with a revised final cap design incorporating topographic contours approximately similar to the original topographic contours for the site. The permittee shall be allowed to operate the landfill for the period needed to fill the landfill to grades that approximate pre-development surrounding ground levels as defined by the U.S.G.S. 7.5 minute series (topographic) Stilwell Quadrangle, Kansas – Johnson County map dated 1956, photo revised in 1970 and 1975. The final cover design shall meet all requirements for “final cover” in K.A.R. 28-29-304(g) or an equivalent approved by the Bureau of Waste Management. Anticipated post-closure use shall be specified and taken into consideration when designing the final cover for the site. The final landfill-grading plan will require water to flow off the final cap into environmentally sound storm water management structures.

Corrective measures to address the groundwater and gas generation problems at the site must be enhanced during this operational period and continue as long as necessary during post-closure to ensure that human health and the environment are protected.

The low permeability of the landfill's shale-base has resulted in a condition whereby much of the waste mass presently sits within surface-infiltrated water resulting in anaerobic conditions that has led to ongoing generation of significant amounts of hydrogen sulfide and methane gases. The company has implemented interim corrective measures to remove and treat contaminated contact water, to collect landfill gases, and to establish a gas monitoring and alarm system. These systems are to be evaluated annually and enhanced as necessary to continue to adequately protect human health and the environment. In addition to dewatering the landfill and operating an effective gas collection system, risk reduction efforts will also require the construction of a low permeability cap over the entire site.

The gas monitoring results have indicated that the ambient levels have been acceptable from a public health perspective. In addition, the Agency for Toxic Substances and Disease Registry (ATSDR), a federal public health agency, conducted a five-week exposure study in areas

neighboring the landfill during the summer of 2006, and found that levels of detected hydrogen sulfide did not present a health hazard to those populations. Accordingly, maintaining safe conditions for persons on-site and in the surrounding areas is dependent upon the effective operation of the monitoring system, the contact water treatment system, and the gas collection system.

In summary, the KDHE has determined that this permit application and associated documents along with the revised permit's general and special conditions meet the regulatory requirements for amendment of the original permit to authorize expansion.

SUMMARY OF COMMUNICATIONS

KDHE received a total of 13 comments (e-mails, letters, and testimony at hearing, etcetera) from the public. Eight comments were received via electronic mail.

Of the 13 comments received:

- Eleven expressed opposition to the landfill
- One expressed support for the landfill
- One was neutral or did not indicate a position

The most commonly expressed concerns follow (not necessarily in order of prevalence or significance):

- Potential impacts to groundwater and/or surface waters
- Traffic safety and related concerns
- Litter
- Potential impacts to future development of the area
- Potential impacts to property values in area
- Potential health impacts to residents/school children from chronic exposure to landfill gasses
- Final landfill elevation
- Odors
- Coyotes living at the landfill
- Sheetrock disposal
- Whether or not the local government zoning approval process was adequate or appropriate
- Expansion of landfill
- Lack of access control at the landfill
- Closing date of facility

The comment in favor of the proposed expansion follows:

- Requested permit expansion is consistent with Kansas's law.

SUMMARY OF COMMENTS AND RESPONSES

All public comments were reviewed by KDHE prior to issuing the permit. Responses to the public comments are provided below. Some comments have been paraphrased to clarify the meaning or context. Comments are presented below in *italics*, with responses following comments in standard typeface. In some instances, responses may refer to previous responses to avoid repetition.

I. Landfill Gas and Air Quality Comments

- a. With continued operation, there would be an increased possibility of health risk for a longer period of time.*
- b. This poses a health issue for residents,*
- c. My primary concern is one of Public Health. I know of no health survey ever being completed for the surrounding residents.*
- d. Health issues from before the start of the corrective action.*

KDHE understands the noted concern that some public exposure to landfill gas may have occurred before APAC initiated corrective measures. In recognition of this possibility, William L. Bider, Director, Bureau of Waste Management has referred this information to representatives of the KDHE Bureau of Surveillance and Epidemiology which evaluates such matters. This bureau will examine relevant factors and decide whether it is appropriate to perform a public health study or to provide the potentially affected public with information to help them better understand the effects of exposure to landfill gases. This effort will proceed outside of the permit action.

Hydrogen sulfide (H₂S) is a colorless, toxic, and flammable gas that produces a rotten egg odor. It often results from the bacterial breakdown of organic matter that contains sulfur in the absence of oxygen. In the case of the APAC-KS landfill, hydrogen sulfide is generated through the decomposition of certain construction and demolition waste constituents—mainly gypsum (a.k.a. drywall, sheetrock, or wallboard)—that are submerged in water.

Currently, hydrogen sulfide is not listed as a hazardous air pollutant in state or federal regulations. However, there are reports that indicate that the US Environmental Protection Agency is “reviewing existing scientific information to determine whether a listing is justified” according to an article entitled “A Gas under Pressure” published in the December 11, 2007 edition of the Wall Street Journal. The gas was once thought to be relatively harmless in low concentrations, but mounting research in recent years shows that prolonged exposure to relatively low-levels may affect memory, coordination, eyes and breathing.

There is much information regarding hydrogen sulfide available to the public. A good way to access available information is through the use of the World Wide Web or Internet. A search using Google, or other search engine, will yield extensive information. The following are but a few links to information available via the Internet:

- <http://www.atsdr.cdc.gov/toxfaq.html> (Agency for Toxic Substances and Disease Registry, FaxFAQ sheet on hydrogen sulfide, July 2006)

- http://en.wikipedia.org/wiki/Hydrogen_sulfide (Wikipedia article with additional links)

KDHE has required monitoring of the site for landfill gases at the perimeter and on-site. The odor threshold for hydrogen sulfide in humans is approximately 1 part-per-billion (0.001 part-per-million). Since the installation of the landfill gas recovery and treatment system, there has been a marked reduction in odor complaints to KDHE and the Johnson County Department of Environment. The few complaints that have been received were made at times when either the landfill gas system was down for maintenance, or, when the facility was aerating portions of their composting pile that contained high amounts of drywall (this was done at the request of KDHE). The perimeter hydrogen sulfide monitors are able to detect the gas at very low levels (between 10 parts-per-billion and 2 parts-per-million). The infrequent detection of low concentrations of hydrogen sulfide at the perimeter monitors normally occurs during the maintenance activities previously mentioned.

The Agency for Toxic Substances and Disease Registry (ATSDR), a federal public health agency, conducted a 5-week exposure study of areas neighboring the landfill during the summer of 2006 in order to investigate whether or not exposures to hydrogen sulfide presented a public health hazard. They concluded that the overall 1-hour concentrations (0.93, 1.05, and 1.13 parts-per-billion) of hydrogen sulfide were similar at all three locations near the landfill. They also concluded that concentrations at these levels did not present a health hazard to nearby residents when considering the agency's acute (70 parts-per-billion) and intermediate (20 parts-per-billion) minimal risk levels (MRLs) for hydrogen sulfide. The ATSDR states that acute exposure would be defined as 1-14 days of continuous exposure and intermediate exposure would be 14-365 days of continuous exposure. The agency has not yet derived a chronic MRL for hydrogen sulfide for continuous exposures lasting longer than 365 days. For periods longer than 365 days, the only agency providing guidance on inhalation exposure to hydrogen sulfide is the U.S. EPA. The EPA indicates that a reference concentration of 1.4 parts-per-billion would be allowable for lifetime exposure to hydrogen sulfide. A table describing the important inhalation hazard concentrations, as discussed above, and the associated reference is attached as Table 1, Guidance Values for Inhalation Exposure to Hydrogen Sulfide.

KDHE required APAC-Kansas to install a landfill gas collection and treatment system in 2006. The treatment system being used at the APAC-KS facility has been tested by KDHE to assure that the hydrogen sulfide removed from the landfill is destroyed. Air quality data may be requested from KDHE's Bureau of Air and Radiation. As part of this permit action, KDHE is requiring an annual review of the design of the gas monitoring system and the design of the landfill gas collection and treatment system. Any changes deemed necessary to assure protection of public health will be implemented and made part of the facility's operation plan.

To minimize hydrogen sulfide and methane gas generation, the site must be dewatered and maintained in a dewatered condition. Permit conditions require that dewatering procedures be enhanced so the contact water level in the landfill be maintained below the bottom of the waste mass prior to closure and during post-closure. It should be noted that gas generation will continue after the groundwater level is reduced as long as the waste is "wet" and

anaerobic conditions exist. This means gas will continue to be generated for multiple decades, but at lower levels than under present conditions.

KDHE has required monitoring for off-site migration of gases on the surface (perimeter monitors) and sub-surface (gas monitoring wells). The perimeter area gas monitoring instruments gather data to measure H₂S air quality to assure that concentrations do not expose the public to chronic health risks at the concentrations defined by ATSDR and the U.S. EPA.

II. Water Quality Comments

- a. *Discharge is rare, but in periods of extremely high rainfall [it] is needed and is per [an] NPDES permitted [outfall].*
- b. *Concerned with the quality of water flowing across their property and into the Blue River. Would like to see test results.*

Groundwater:

There is very little groundwater in and around the site—not enough to be useable. APAC-KS, Inc. has installed 12 groundwater-monitoring wells at the site and is required to sample the groundwater around the landfill for contamination. This groundwater monitoring requirement was added due to the identification of hydrogen sulfide contamination in the infiltrated water accumulated above the landfill base. Groundwater monitoring is generally not required at C&D landfills. However, the department has the authority to require monitoring when necessary to protect human health and the environment (K.S.A. 65-3411).

The groundwater sampling and analysis occurs twice each year, and to date no contaminants have been detected in the site's perimeter monitoring wells. As specified by K.A.R. 28-29-12(e) and K.A.R. 28-29-19, the Bureau of Waste Management may continue to require groundwater monitoring for at least 30-years after the landfill is closed and is no longer accepting waste. Should groundwater contamination be discovered, KDHE could then require APAC-KS, Inc. to continue monitoring the groundwater indefinitely. KDHE could require the installation and monitoring of additional monitoring wells if groundwater contaminants begin to migrate away from the existing monitoring wells. Per K.A.R. 28-29-8(b), if it is discovered that the groundwater is contaminated to levels above KDHE Tier 2 Risk-Based (Groundwater Pathway – Residential, RSK Manual, June 2007) levels, then KDHE may require APAC-Kansas, Inc. to take corrective measures to remove the contamination from the groundwater.

The adequacy of the groundwater monitoring system is evaluated annually. Typically a site is in Detection Monitoring mode at a sampling frequency deemed appropriate for the site, and for the analytes deemed necessary for the waste material. A site may remain in this mode during the entire operational, closure and post-closure period. However, if contaminants are detected in the groundwater while in the Detection Monitoring mode, the monitoring program is elevated to Assessment Monitoring mode to identify the source of contaminants, and the extent of contamination in the groundwater. In the assessment phase, the contamination levels and the statistical significance of the contamination are assessed. The assessment may trigger the Corrective Action mode in which operational changes to the

landfill and/or groundwater cleanup procedures are implemented. This is ongoing throughout the life of the landfill including the operational life and post-closure period.

Surface water:

Prior to the development of this site by quarrying, a natural stream did flow cross the northeast portion of the area. However, the stream has been rerouted around the quarry/landfill area. APAC-KS, Inc. has a National Pollutant Discharge Elimination System (NPDES) permit issued by KDHE Bureau of Water (BOW) to discharge treated C&D waste contact water from the site. The permit specifies quantity and quality pollutant limits and testing requirements, which the facility must meet before discharging, treated contact water off-site. The current NPDES permit authorizes the facility to discharge a maximum quantity of 240 gpm (345,600 gallons per day) from the site as long as the quality of the water being discharged meets permit specified limits. The limits are based on the fact that the receiving stream, the Blue River, is a classified stream, pursuant to K.A.R. 28-16-28. The water discharged from the site is regulated to meet applicable water quality standards. Designated uses are aquatic life support, primary contact recreation, domestic water supply, food procurement, groundwater recharge, industrial water supply, irrigation and livestock watering. Additional information related to chemical specific discharge limits and water quality monitoring results for this NPDES permit, Kansas Permit No. I-MO26-PO04, can be obtained by contacting the Bureau of Water at 785-296-5513.

III. Community Impact Comments

- a. *We notice the odor smell from the landfill when it is operating. We notice that it is not pleasant.*
- b. *Over the past several years we have noticed a great deal of nausea odors.*
- c. *Yes, but since corrective action have not smelled any.*
- d. *It stinks.*
- e. *Still contend with foul odors from the landfill (hydrogen sulfide gas), and as I understand from the meetings, this will continue for many years.*
- f. *Preteen children have had a negative reaction from the noxious odors from the Dumpsite and this has impacted their ability to enjoy playing in their own backyard.*
- g. *Monitoring system shows operational and other controls are working properly.*
- h. *Nobody checked to see what they were dumping.*
- i. *There is traffic congestion with no access from the north.*
- j. *Limited access, blind corner and speeding truck traffic creates safety hazard. There have been many accidents along the road*
- k. *...you are forcing a circumstance where large trucks must travel down the two lane Metcalf Avenue... East and west access to the dumpsite is also through two lane road,*
- l. *After rains, trucks track mud and debris. They don't pay for car washes.*
- m. *Dumpsite has large packs of coyotes compared to adjacent areas impacting children's willingness to walk dogs in backyard because of excess howling from the site.*
- n. *Concerned that trash blowing from the landfill could devalue the property.*

KDHE was not involved in the local zoning decision. Department involvement in these processes is limited to answering questions regarding the state's permit process and making assurances to local governing authorities that KDHE will consider all technical issues related to facility design, construction, and operations. Zoning officials are told by KDHE that they may consider such technical issues, if they choose to do so, as part of their land use decisions; however, they may also defer these matters to KDHE which is directed by state law to technically evaluate every solid waste permit application.

Kansas law (K.S.A. 65-3407(m)(2)) specifies that “Before reviewing any application for a solid waste processing facility or solid waste disposal area, the secretary shall require the following information as part of the application: If the location is zoned, certification by the local planning and zoning authority that the facility is consistent with local land use restrictions or, if the location is not zoned, certification from the board of county commissioners that the facility is compatible with surrounding land use.” This application was received after it was certified by the City of Overland Park as being compatible with the surrounding area and by Johnson County as being in conformance with their Solid Waste Management Plan. This facility has been permitted for over 23 years and current buffer zones were in existence before this application to expand was submitted.

KDHE will work within the limits of its statutory authority to ensure that APAC-Kansas updates its facility operations plan and that problems associated with landfill traffic are appropriately addressed (i.e. tracking of mud onto public roadways, off-site litter, etc.). KDHE has a procedure for citizens to file complaints that will be investigated. For this process to work effectively, the KDHE District staff in Lawrence should be notified promptly by the complainant.

Regardless of where a landfill is located, the very nature of such a facility presents some level of risk to human health and the environment. KDHE agrees that some sites would present lower risks than others and this site, due to its proximity to the public, does present higher risks than more remote locations. Nevertheless, the state statutes and regulations do not authorize KDHE to require that only the lowest risk sites be used for landfills. Instead, the laws of Kansas require KDHE to issue a landfill permit for any site where a landfill is proposed that conforms to Kansas's statutes and regulations. Those same laws also authorize KDHE to consider the hazards presented by solid waste operations and to require appropriate corrective measures when necessary to protect human health and the environment.

Operational control measures at the landfill are required in order to mitigate odors. Gas extraction wells are being used to control the migration of gases off-site. Contact water that currently has the potential to create odors is being treated and the waste mass is being dewatered to mitigate/diminish the generation of landfill gas. As KDHE continues to monitor the operation, it will consider if continued disposal of sheetrock in the landfill is appropriate for this facility. Monitoring measures include gas monitors at selected locations along the perimeter to determine if hydrogen sulfide is present and to record these levels if it is present.

KDHE's permitting authority is to ensure that the landfill operation is environmentally acceptable. KDHE will inspect the site for damage to the landfill cover and other features from wildlife activity, e.g., coyote activity possibly associated with the landfill. For off-site issues with increased wildlife presence, interested persons are referred to the Kansas Department of Wildlife and Parks.

IV. Facility Design and Operation Comments

- a. *The quarry/landfill should reclaim the land like in Southeast, KS. I don't need a landfill mountain that is a monument of a reminder of your lack of responsibility by going 10, 15 or 20 feet above normal ground elevation.*
- b. *Keep in mind the topomap you are using reflects changes to the site prior to the topography map being done. If this berm were removed and returned to the natural landscape the dump is full as we speak.*
- c. *Final elevations provided for in the proposed amended permit are consistent with the original elevations at the site.*
- d. *Lower the sides to fill in the middle, and don't let the fill be so high.*
- e. *Change "equivalent" to "alternate"*
- f. *Another concern is Chinese sheet rock. Parts of her yard and garden were dying. Once the smell was gone, it started growing again. Recommend banning disposal of sheetrock in this landfill.*
- g. *.... not having a firm ending date for this dump site. APAC-Reno could easily manipulate the closing date to never ending.*
- h. *KDHE should determine the appropriate time required for closure and incorporate that date in the proposed permit.*
- i. *Allowing unlimited continuance of operation while counties and cities simultaneously approve more development in the adjacent area will only increase health and safety impacts on more neighborhoods....*
- j. *Revocation led to appeal to expansion?*
- k. *Permit revocation lead to appeal which lead to expansion?*
- l. *...due to uncertainties of future conditions created the landfill, expansion would not [be] a good idea.*
- m. *Appellate process appears to have resulted in rewarding the permittee with an expansion.*
- n. *Do not understand KDHE's rationale to allow an expansion which will increase the environmental impacts to the surrounding neighborhoods. The proposed permit should not allow expansion of this operation but should only specify compliance requirements for the existing operation.*
- o. *Not appropriate for this dense population area - remand the permittee to the city for a more appropriate license renewal process*

In January 2004, the Kansas Department of Health and Environment promulgated regulations specific to the management of construction and demolition waste in Kansas. State Statute had defined, and refined the definition, of construction and demolition waste through 2002, and these regulations completed the process by setting standards for the design and operation

of permitted construction and demolition waste landfills (CDLFs). All the permitted CDLFs in Kansas were required to update their designs and operations to meet the promulgated regulations, and submit engineering documentation for KDHE to review and process as updated permit documents.

Updating of the design drawings revealed that waste had been disposed over a horizontal footprint that covered approximately 80 acres. KDHE required the permittee to obtain clearance from local government. That cleared the way for KDHE to review the permit for compliance to state solid waste statutes and regulations. In Kansas, landfill permits authorize the permittee the use of airspace for disposal. The airspace that can be beneficially used is dependent on the disposal envelope defined in the design drawings and operational factors such as the degree of compaction of the waste material and the volume of waste received before cover soil is required to be placed over the waste. The time frame within which this capacity is to be used is typically not specified in the permit, since that is dependent on the volume of waste received each day. Environmentally safe closure of landfills is best achieved when the landfill is closed to the designed envelope, with the proper cover, and the permit as currently being issued is intended to achieve this.

Final grades of a landfill are considered environmentally ideal when the amount of on-site soil used for intermediate cover, and final cover are balanced with the volume of waste disposed within the permitted envelope. A closed site is environmentally most stable if returned to the original landform. Through a special condition in the revised permit, KDHE is requiring the permittee to consider this element in the design of the final elevations of the disposal envelope.

The permit application for modification was submitted at the request of the Bureau of Waste Management in order to update the facility's permit to conform to actual waste disposal practices. State regulations require KDHE to provide the public with a notice of all significant permit actions, such as expansion of a landfill's disposal area. The permit review team assesses the local publications and selects the most appropriate publication(s) to post the public notice. Regulations require publication in the Kansas Register and in a newspaper having major circulation in the vicinity. The permit review team also assesses whether there appears to be significant local public interest to determine whether a public hearing should be held. It was clear from this assessment that there was significant public interest; therefore, a public hearing was scheduled and held, including an informational meeting segment. All permit review team members participated in the informational meeting and the public hearing.

KDHE is the state agency authorized and directed by state law to assure that wastes are properly managed in Kansas. (Chapter 65, Article 34 of the Kansas Statutes). One of the means to assure proper solid waste disposal is to require owners/operators of solid waste disposal activities to obtain a permit from KDHE. The department follows a comprehensive checklist based upon applicable laws and regulations when reviewing each permit application for a solid waste disposal facility. In addition, KDHE considers appropriate engineering standards of design and operations, and the capabilities of the applicant, to ensure that the proposed facility will be protective of human health and the environment.

KDHE permit application review team consists of technical experts in the fields of engineering (specializing in landfill design and operations), geology and hydrogeology, and financial assurance. The review team evaluates each application with respect to the following:

1. Qualifications and capabilities of the applicant: Review the financial structure, environmental compliance history, criminal background check if appropriate, of the applicant;
2. Local government approvals: Assure that the applicant has secured local government approvals related to zoning of the site and approval from the Board of County Commissioners that the activity proposed to be permitted is consistent with the County's/Region's Solid Waste Management Plan;
3. Public Participation: Assure that the public has opportunity to give input into the technical review of the application by KDHE;
4. Site Hydrogeologic Assessment: Assure that the site hydrogeology has been characterized based on regional information and site-specific information. This information is to be used in the design and operation of the containment and the groundwater monitoring system;
5. Location issues: Assess the site to address potential impacts to/from neighbors within specified distances, airports, streams and related floodplains, navigable rivers, public surface water intakes, seismic impact zones, historic sites, wetlands, and wildlife;
6. Design issues: The waste to be managed is characterized by testing, and the disposal site designed to assure proper containment of the waste mass, and that gaseous and liquid contaminants that may be generated by the waste mass are managed appropriately;
7. Construction issues: Assure that the permit documents include a Construction Quality Assurance (CQA) Plan prepared by a Kansas licensed professional engineer and that the plan assures construction be in accordance with the approved design. Disposal of waste is only authorized in areas that have been constructed under the oversight of a CQA engineer and the engineer's certification approved by KDHE. Acceptance of the final closure documents for the landfill has to follow a similar process;
8. Operational issues: The permit operational plan addresses the disposal of waste within the landfill to assure proper containment while minimizing impact to the environment. Impacts such as aesthetics, odor, waste mass stability, stormwater management, etc. are considered in accordance with the approved design;
9. Environmental monitoring: Groundwater is monitored at the site. Typically a site is in Detection Monitoring mode at a sampling frequency deemed appropriate for the site, and for the analytes deemed necessary for the waste material. A site may remain in this mode during the entire operational, closure and post-closure period. However, if contaminants are detected in the groundwater while in the Detection Monitoring mode, the monitoring program is elevated to Assessment Monitoring mode to identify the source of contaminants, and the extent of contamination in the groundwater. In the assessment phase, the contamination levels and the statistical significance of the contamination are assessed. The assessment may trigger the Corrective Action mode in which operational changes to the landfill and/or groundwater cleanup procedures are implemented;

10. Financial Assurance: The permittee is required to provide financial assurance to KDHE to assure that the site will be properly closed and cared for during the post-closure period. Costs are estimated annually to cover the cost of third-party closure, if necessitated during the following year, and the ensuing post-closure care. The approved cost estimates are required to be assured with one of several regulatory specified financial instruments so KDHE can call on those funds if the need should arise.

After a facility receives a permit, KDHE staff will monitor compliance in several ways including routine comprehensive inspections, complaint investigations, and the annual permit renewal process, which includes an assessment of financial assurance and insurance. In addition, when a facility is carrying out corrective measures, such as is occurring at this facility, KDHE staff are much more active involved with monitoring activities and performing site visits.

Kansas' solid waste laws and regulations require each permitted solid waste disposal facility to be closed and maintained after closure in such a manner as to achieve a state of equilibrium within the minimum 30-year post-closure care period. Groundwater monitoring, when required, and cover maintenance are key components of the post-closure monitoring and evaluation. If, within the minimum 30-year period, KDHE determines that post-closure care needs to be amended or extended, then KDHE regulations explicitly authorize the department to do that.

The question was raised as to whether the compliance history of this company should influence the decision to issue this permit modification. Compliance history is relevant because it may indicate the facility's ability to consistently operate within the regulatory requirements. K.A.R. 28-29-10 specifically authorizes KDHE to deny a permit application, or revoke a permit, due to past violations of solid waste laws. If a permit applicant has historically operated a solid waste facility, then KDHE considers the number of past violations, the types of violations, whether the facility operator corrected the problems in an appropriate and timely manner, whether significant impacts to human health and the environment occurred, and whether significant public nuisances occurred. Using this approach, KDHE-BWM has denied one permit.

In this case, APAC-KS, Inc.'s compliance history was considered during the permit review process and some areas of documented non-compliance were identified. However, the nature of the violations was not severe enough to deny the permit application on that basis alone. Nearly every operating solid waste facility in Kansas has some record of non-compliance as related to the large number applicable laws, regulations, and permit conditions that are checked during each inspection. KDHE takes all violations seriously and facilities are expected to correct problems immediately. However, minor violations that are not habitually practiced are generally not considered to be reason enough to deny or revoke a permit. APAC-KS, Inc.'s most serious violations were related to the receipt of unauthorized municipal solid waste, some of which came to the facility in transfer vehicles filled at Missouri transfer stations that handle both C&D waste and municipal solid waste. Actions were taken by APAC-KS, Inc. to enhance waste screening to avoid this problem. The facility was never cited for violating the permit by disposing of waste in unpermitted areas as

suggested in some public comments due to uncertainty in the meaning of designated disposal areas on old permit documents.

Statutes and regulations referenced in this document can be viewed at <www.kdheks.gov/waste>. The web site also includes other information such as policies, technical guidance documents, facilities database, etc.

Table 1*
Guidance Values for Inhalation Exposure to Hydrogen Sulfide

Concentration, ppb	Exposure Period	Source
1.4	Lifetime	USEPA RfC
20	14-365 days	ATSDR Intermediate MRL
70	1-14 days	ATSDR Acute MRL
100	1 hour	AIHA ERPG-1
10,000	10 minutes	NIOSH 10 minute ceiling
30,000	1 hour	AIHA ERPG-2

USEPA: U.S. Environmental Protection Agency

RfC: Reference Concentration – level protective of public health, even sensitive populations

MRL: Minimal Risk Level – level protective of public health, even sensitive populations

AIHA: American Industrial Hygiene Association

ERPG: Emergency Response Planning Guide – 1-hour of exposure that would result in mild, transient health effects (ERPG-1), irreversible health effects (ERPG-2), or serious injury or death (ERPG-3)

NIOSH: National Institute for Occupational Safety and Health, Centers for Disease Control and Prevention

* Testimony by Lt. Michelle Colledge, ATSDR, U.S. Department of Health and Human Services, before the Economic and Environment Committee, Ohio Senate, May 11, 2005

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