

The Effects of Poorly Educated Individuals Attempting to

Drain Tracts of Land With No Outlet

A real-world environmental science issue in

Southwestern Mitchell County, Iowa

Intro to Environmental Science

Prof: Frank Weirich

Written by: Adam M. Lack

ID #00136685

TA: Tom Marshall

5.9.05

The damages that can result from increased surface water speeds, their redirection, and the creation of artificial outlets should be not only closely monitored, but also met with stiff penalties in the cases that they cause harm to others. The potential for harm has no end. Some damages are obvious and instantaneous, while others fester slowly with time, and are nearly indiscernible. While existing in an extensive network, the various government organizations involved in the monitoring of such processes lack the ability to properly communicate with one another, and fall far short of their intended purposes to protect the common good of all. An alarming trend seems to suggest that, at times, the very individuals requiring their consideration are easily alienated by the very manner in which these groups do business. One should be aided in their attempt to do what is right, environmentally speaking, not bullied politically and financially into merely going along with some haphazard and misguided excuse for a plan that barely benefits a few, while slowly and quietly harming the many through the pollution of our aquifers and streams.

There is currently a surface water dilemma playing itself out in southwestern Mitchell County, Iowa, specifically in Cedar West Township, and focused on sections 11 and 10 (Plat [look A. B. &C). The problem begins when an area of historically ponding water is considered ('82 aerial moisture map). This area lacks any significant slope or outlet, so, following any sizable rainfall, water ponds for a relatively short period of a few days in many scattered depressions. Overall, the ponding affected local farmers through slightly reduced grain yields, and was tolerated, since no reasonable solution could be found.

Over time, farmers in the area began shifting the usage of moist areas such as these from grass and pasture to purely grain production. The push to increase yields/acre resulted in the widespread utilization of field tile. Tile is not without its limitations as it still requires slope in order to fulfill its duties. The idea of "farming every possible square foot" also took its toll on buffer areas surrounding areas prone to sinkholes; an especially important concept to grasp when considering the shallow nature of karsted Devonian limestone that is prominent in this portion of northern Iowa. The nature of running" tile and digging drainage ditches resulted in increased sinkhole emergence as well.

A local farmer, Brad Johnson, who resides and farms in section 10, began experiencing problems in the late '70's and early 80's. As ponding water increasingly encroached upon his feedlots, he experienced higher livestock mortality rates. As a result, he began to look for ways to move the water. He began by digging two ditches in order to facilitate the drainage of water near his north and south feedlots towards the Echo Avenue box culvert. This generally decreased the problem, and he began placing tile in the area as well. The tile lacked a suitable outlet, however, so he used a large existing sinkhole as a drainage well, which is a legal process, provided one obtains approval and the necessary permit, which he did not. In order to disguise the fact, he then capped the sinkhole above the outlet and began planting a grove of trees around it and along his ditches. These actions are at least partially apparent in the series of included aerial photography provided by Ms. Lack of section 11 (east of Johnson).

At this time, Johnson apparently began to encourage his neighbors to his west and north to channel water in his direction. Over time, however, the ponding water once again began surrounding his operations, and he began looking for answers beyond his own backyard. The nearest boundaries of the ponding region lie a mere quarter mile to his

east. In addition, to reach this lip, he would have to cross the land of Dean Kleckner (later Brundau), head of the Farm Bureau, a man who is no pushover. Even if he received permission from Kleckner, he then would need further permission from Veronica Lack, the next set of neighbors to Kleckner's east, who owned ground that sloped in the proper fashion to the east and south. Both Kleckner and the Lacks are landowners that see land as a safe and long-term investment provided that it is properly maintained in a manner that coincides with basic environmental and agricultural practices. Kleckner's land was a major obstacle to Johnson's plans because it sloped uphill four feet or more towards the Lacks' from the Echo Ave. box culvert floor. It then met with a large sinkhole in the middle of Kleckner's, and proceeded to slope uphill or at least remain level on its path to the Lack fenceline.

Johnson began considering an array of outlandish solutions. First, he imagined a large ditch that would have to be very deep and wide to facilitate the necessary flow, as he saw it, across the Lack farm, where he felt it would suffice to merely dump the water on a small existing watershed on the next neighbor to the east. This idea represented an ominous sign of his character and things to come later on. Then Johnson conceived an idea utilizing 1-2 extremely large tile lines that pass through the hill, but would require a lift station, of sorts, to function. He quickly realized that the price of such a project would far outweigh its usefulness. Frustrated, Johnson threatened his neighbors to the east via potential claims of blockage of water. This concept could be taken seriously if one maintained the imagination necessary to conceive hands of the Lacks and Kleckner large enough to move glaciers in the last ice age. Needless to say, the neighbors would not compromise.

The Lacks bought their land in 1993, just in time to experience the 100 year flood, which amounted to 7.5" of rain falling in a few hours on an already regionally inundated landscape. Their renter was forced to plow under the corn crop on the 120 acres south of 325th St. in early fall in order to collect insurance. As a result, Mr. & Mrs. Lack took on additional expense to repair their south 120 watershed in exactly the manner prescribed by current conservation practices. The watershed performed perfectly for a number of years, and underwent the ultimate test in 1999, when an aptly named 150 year flood showed its teeth in the form of 13.5" of rain in less than one day on already wet ground. The watershed on the south 120 acres survived while experiencing minimal to moderate damage, which was promptly repaired at a reasonable expense. It as a tribute to the proper management practices of the couple.

Throughout the ownership of their farm, the Lacks have consistently allowed the county to take drinking water samples, in hopes of keeping up to date on the quality of their well and its corresponding aquifer. The water was annually tested for nitrates and bacteria, and the results were given to the county by the testing authority. The results were never shared with them, although in the mid 90's, the county suggested the implementation of a chlorination device to decrease bacteria presence. In 1998. the Lack's received a test result from the Mitchell County sanitarian stating that the nitrate/bacteria levels were acceptable. In 2004. however. Ms. Lack was retroactively notified by a DNR agent from Iowa City that it was common knowledge to the hygienic lab at the University of Iowa (as early as '93) that the Upper Cedar Valley Group Aquifer had been contaminated with nitrates at high levels. It seems unjust that someone would have to actively search out such results h submitting private tests, such as the case with Ms. Lack, only to find out the true state of affairs in 2004. when state and county agencies maintained full knowledge of the potential harm to those consuming the water.

In the early '90's, Johnson was notified that his well was contaminated and that the high nitrate levels were probably responsible for some livestock losses. He then received thorough financial assistance from a government agency to drill a deeper well in 1993. This possibility was never made available to the Lacks, who also had livestock. They noticed livestock losses in their hog populations, and upon examination by the veterinarian on several occasions, the cause was found to be massive fast-growing tumors. The veterinarian expressed concerns about nitrate levels as well, but the Lacks assumed the county would inform them if their well was polluted. Many hogs that lived to see the slaughterhouse were docked portions of their weight due to the presence of tumors and miscellaneous masses in their bodies.

In 1993, neighbors in the area began to notice odd smelling tap water and poor clarity/taste, but received no notification from the county which seemed to be 'guarding' the test results. In August 2004, Ms. Lack began sending in her own samples independently to the hygienic lab in Iowa City. The levels of nitrates began to make themselves known as persistently high. Anything above a reading of 15 mg/L is considered not worthy for consumption, and the water was consistently testing at levels in the 78-95 range. Other test results were as follows:

Nitrite Nitrogen as N, .02 mg/L (at action level); Ammonia Nitrogen as N, .24 mg/L (nearly 5 times action level); Lead .036 mg/L (about 2 1/2 times action level); and relatively high presence of Coliform Bacteria, especially after water runoff events.

At about the turn of the millennium, two relatively young inhabitants of this small area developed rapid onsets of cancer. Mr. Lack developed prostate cancer at 53 and fought it for a few years with the help of his family and trips to the Mayo Clinic. He then developed colon cancer and was treated for both cancers. Then his potassium levels began to climb, and was told to drink lots of water to flush the potassium from his system. This only made that condition worse and he died at 5 in January. '04. A neighbor to the west, Mrs. Gas. only in her forties, developed breast cancer and died shortly after. The Lack family dog nearly went blind and developed a mast cell tumor in her abdomen which was recently removed. The tumor has so far not returned since the drilling of a new well in '04. The same goes for Mrs. Lack's skin irritations and loss of hair, which are less apparent since the new well was utilized.

The Kleckner farm sold to William Brandau in 2002, and Johnson spared no time in attempting every angle of influence to persuade him to alter surface elevations to enable surface water movement towards the east and the Lack farm. One is left to assume that Brandau eventually gave in to Johnson's demands/requests, when his resulting actions are considered.

On April 15th, 2003, the Lacks arrived home after a long day of Mr. Lack's treatment in Rochester, MN, only to discover large diesel-powered excavation equipment on the western extent of their farm raising holy hell with the terrain. A large section of fenceline had been removed on the border of their and Brandau's land. Topsoil and limestone had been removed in and around their existing watershed to an additional depth of over 5 ft. in the center of the watershed. Later, vast surrounding areas were stripped of valuable topsoil until only exposed limestone remained. Nearly all of the removed material had been apparently transported to Brandau's land in some desperate attempt to create embankments and slope. Photos 1A&B show Mr. Lack, still with his chemotherapy bandages on his 'wrist, stopping the contractors from Mayer Excavating, which had been employed by Brandau, from continuing. The second photo shows Lack demonstrating the original fenceline level. Photo IC' illustrates further work done on Brandau's, which ceases at the sinkhole in the middle of his land due to what the workers deemed an imminent collapse of the sinkhole Structure. The contractors mentioned that they had been assured by Brandau that permission had been granted by the Lacks to gain access and perform their tasks. This came as a great surprise to Mr. & Mrs. Lack.

The Lacks then called the Sheriff and filed a trespassing complaint. Later that evening, the Brandaus assured them that they would repair all damages and replace the topsoil, as well as the fenceline to their previous levels. However, the excavation firm returned the next morning and began further detrimental procedures, going completely against Brandau's promises while being employed by Brandau. The Lacks noticed the work going on from their bedroom 1/2 mile away, but they were sick and spent from the day before, and merely assumed that Brandau's promises were being carried out.

In May and July of 2004, two separate 10 year rains fell resulting in approximately 4.5" of rain in only two hours. With the grade and altitude of the fenceline gone, the massive influx of water from the west met little barrier as it filled Johnson's and then Brandau's farms. When the water reached the necessary height on Brandau's ground, it poured over onto Lack's, despite still traveling over a small hill, and eroded everything in its path and utilizing nearly every facet of surface erosion possible. Photos 2A&B show the water after it had calmed considerably from its maximum inundation levels, but also show the remnants of the high-water levels. The water was over eight feet deep in the center, and over 150 feet wide in places. The road and box-culvert to the west of the Lacks' home were all but destroyed. Photo 2C illustrates the water that was not able to travel over the road near the box-culvert, which then remained on the north side of the road and headed east towards their home, filling their yard and causing hood damage to their borne. Photos 3A,B, &C show damage to the road all the way from the Lack residence 3/8 mile east, back o the box-culvert. Photo 4A shows a sinkhole opened on the south side of Lack's box-culvert and corresponding erosion effects. 4B illustrates how close the event was to permanently jeopardizing the culvert structure. which has stood for nearly sixty years. 4C is another view of the watershed damages downhill from the culvert.

After the death of her husband in early '04, Ms. Lack met with Jim Hudson, a drainage lawyer, from Pocahontas, Iowa. He educated her on potential plans of action to restore her property and advised her to meet with a drainage engineer named Don Etler. Mr. Etler advised Ms. Lack to make Brandau aware of her intentions to repair the damage and that she expected him to reimburse her for damages/repairs. As expected, Brandau offered no compensation or admission of guilt/responsibility. Ms. Lack went on to consider various proposals by Etler. The concept of a NRCS design approved grade restoration structure seemed to make the most sense. The purpose of the structure would be to create a 2.5-3 ft. wall at the west extremity of her watershed, which would replace the original grade of the farm field east of her fenceline, while also facilitating the future flow of surface water in flood events such as a 10yr. event (4.5" rain) or a 25 yr. event (5.2" rain) without failure. These calculations by Etler are extremely sensitive to his perception of the total acreage of potential runoff. He used the figure of 800 acres, but has since expressed doubt as to whether that figure would encompass the totality of runoff.

Etler advised Lack that she was justified in erecting the structure, which was completed in late '04. Photos 5A&B illustrate the primary portions of the structure. 5C shows the structure performing its obligations in February '05 after large snow/icepacks were melted during a warm spell. 5C, which faces west, also illustrates the fact that Brandau's watershed still travels uphill from the west to its center (in distance 5C). 5C fails to show the normal function of the structure during a flood event, where water is actually flowing over the lowered central portion of the structure, as seen in 5A.

Construction of the structure and repairs to the watershed were costly and took a great deal of time, as work was delayed due to the availability of contractors and cooperation of the weather. Costs continue to mount for Ms. Lack, and at last check amounted to well over \$150,000. A lawsuit is pending against Mayer Excavating and Brandau, but there is no assurance that Ms. Lack will be reimbursed for her expenses at this time, although one may assume that necessary considering the circumstances. Ms. Lack is currently following up by seeding a mixture of grasses (brome, timothy, & rye) around the structure and throughout the watershed. As is in line with her experience thus far, weather is rarely permitting.

Currently, there are several families in the immediate area who continue to derive their drinking water from shallow (<100 ft. deep) wells reaching only the upper aquifer, which Lack finds unsettling in the cases of families with children. Ms. Lack recently perused an EPA website that the Mississippi River has been polluted by anhydrous ammonia as a result of farm applications. She was disturbed to find that while the EPA had tracked the pollution up the Cedar River and Rock Creek near her home, they lost track of the source at exactly the point where the watershed that crosses her property on the south 120 enters Rock Creek, less than ½ mile east of her home. Despite her efforts to explain matters to the EPA in the past, they fail to understand the massive runoff events in her area since the '93 and '99 floods. She seeded to prevent erosion in 2004, and reseeded in 2005, after the more frequent flooding damaged her land repeatedly. The GRS structure and other conservation work had helped to lessen the flood damages from Brandau's new channel.

In conclusion, one must ask, "What should Johnson/Brandau have done, if anything?" The answer is most clearly, nothing save to absorb the problem by accepting its moderate and temporary effects as they pertain to the two landowners in question. Everything else they have undertaken has resulted in massive problems to neighbors, some of which will probably not be rectified in our lifetimes. The feedlot problem could have been addressed by merely moving the lot. Permission should absolutely have been secured in advance of excavation work, and in its absence, the only sensible alternative is no action. It is a widely accepted rule, derived out of necessity that one is to never lower existing levels of waterways or watersheds, especially in their midpoints, due to the inherent problems associated with doing so. Iowa law states clearly that a landowner is never to substantially increase the "rate" or "manner" of flow onto a neighboring landowner's property. Landowners should give extensive consideration to all possible effects of speeding or redirecting the flow of surface water, and at all times, the necessary permits and permission should be gained in advance. The alternative is a long, messy, and painful process that should come back to haunt them.