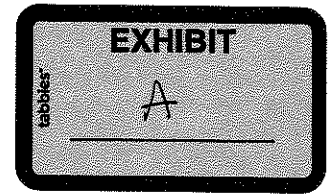




50 West 14<sup>th</sup> Street, Suite 200  
Helena, MT 59601  
tel: 406-441-1400  
fax: 406-449-7725

DRAFT



September 2, 2008

Mr. Tom Rogers  
Planner  
Gallatin County Planning Department  
311 West Main, Room 208  
Bozeman, MT 59715

Subject: Morgan Family Gravel Pit Traffic Assessment (TA) Review  
Gallatin County, Montana

Dear Tom:

This letter has been prepared to document Camp Dresser & McKee's (CDM) review of the submitted Traffic Assessments (TAs) for the Morgan Family Gravel Pit. The two submitted TAs were dated February 2008 (original TA) and July 2008 (updated TA). The location of the proposed gravel pit is in Gallatin County, and is generally located east of Gallatin Road (US 191) and north of Zachariah Lane.

We feel that the both the original TA and the subsequent update to the TA have been completed in accordance with general traffic engineering methodologies and principles. We can find no flaws in the trip generation, distribution, assignment and/or technical analysis of the material. We do want to point out a few items of interest, however, that the County may want to consider as the proposal is being contemplated through the approval process:

#### General

- It would be helpful to either have a graphical exhibit or a simple statement in the EA that discusses the proposed approach and its relation to other driveway approaches in the area. We acknowledge that Zachariah Lane and Axtell Anceny are the two closest major public approaches, to the south and north, respectively. However, depending on left-turn and/or right-turn bay configurations, it is important to note where other "private" approaches might be located near the project, as the bays can affect those particular access points.
- A statement (or a graphic) with measurements to the adjacent intersection may be in order as well. This is useful in recognizing the minimum distance between the proposed approach and the existing private and public intersections, and ties into the sight distance analysis. The TA states that sight distance is acceptable at the proposed



Mr. Tom Rogers  
September 2, 2008  
Page 2

access (page 12 TA), however some additional language regarding the distance between approaches may be appropriate.

- The TA Update (July 2008) was primarily intended to analyze crash statistics and draw conclusions in response to the review letter issued by the MDT dated April 18, 2008. We have no criticisms of the crash analysis, nor the overall updated TA, except to say that the inclusion of the Gallatin Road segment in the data being analyzed may not be appropriate for the analysis as it pertains to "Crashes Involving Trucks" (table 2 and 4). The other four locations in the two tables are road segments of similar nature that have an existing land use comparable to that being proposed with the Morgan Family Gravel Pit. Since the proposed gravel pit along Gallatin Road does not have the gravel pit usage currently in place, it seems that potential truck crash rates should not be included in the "sub-analysis" in tables 2 and table 4. The real result of removing the fifth location from tables 2 and 4 would be that the "averages" at the bottom of the tables would be modified somewhat for each of the columns being presented.

#### Compliance with Gallatin County Traffic Impact Study Requirements (dated May 5, 2008)

In reviewing the original TA and the updated TA against the Gallatin County Traffic Impact Study Requirements (dated May 5, 2008), we offer the following comments:

##### Item 2 - Scope of Work:

The only "study time frame" observed in the report was for the current, existing year (year 2008). However, it is stated in the TA that the "...gravel pit is estimated to operate over the course of the next ten years". The County's TIS requirements imply that the TA needs to assess operations at the 5-year and 10-year increments into the life of the project. This would require a modification to the traffic volumes along Gallatin Road by adjustment of the existing traffic by an appropriate growth factor.

##### Item 3 - Minimum TIS Requirements:

Trip generation forecast - note that the preparer of the TA correctly acknowledges that the Institute of Transportation Engineers (ITE) Trip Generation Manual "...does not provide trip generation data for a quarry, gravel pit, or other similar land use" (page 7 TA). As such, the preparer generates trip generation rates from similar gravel pits for average daily traffic, AM peak hour trips, and PM peak hour trips. We find no flaws with the derivation of the trip generation rates used in the TA.



Mr. Tom Rogers  
September 2, 2008  
Page 3

Existing conditions – it is unclear whether there are any “recently approved but not-yet built” developments that exist in the County that may have an impact to the presented analysis. The County TIS Requirements specifically state that for the “Existing Conditions” analysis that existing conditions include “...development that has been approved but not yet built, as identified by the Planning Department”. In theory, any such subdivision that meets that requirement and utilizes Gallatin Road should be recognized and traffic volumes along Gallatin Road adjusted accordingly for the TA operational analysis.

Level of Service/ Average Delay/Volume-to-Capacity Ratios – These parameters are presented on page 12 of the TA, with the exception that 95% Queue Lengths have been presented instead of the v/c ratios as required in the County’s TIS Requirements.

Forecast traffic volumes – As was pointed out on page 2, the TA looked at the current year only (i.e. year 2008). According to the County’s TIS requirements, the TIS should forecast traffic volumes “with and without the use”. In this case, a forecast to the year 2013 and 2018 should be made without the use and with the use.

Analysis of right and left turn lane warrants – although this is solely an MDT decision, it appears that the information contained in the original TA does justify a southbound left-turn bay based on advancing and opposing volumes, and percentages of left-turning vehicles in the traffic stream, in accordance with Figure 13.3C of the MDT Traffic Engineering Manual. This figure and the corresponding data points were plotted and included in Appendix D to the TA.

Weight of loaded trucks – the County TIS Requirements implies for mining and/or related processing operations, that the “weight of loaded trucks” be considered within the TIS. This is absent in this TA. However since the main access point is onto Gallatin Road, a rural principal arterial, we don’t believe the extra loading associated with this type of vehicle usage will have a direct impact on the adjacent facility. This would be different if the gravel pit was located in the middle of a rural area away from the main roads.

Analysis of access road conditions – again, although this statement seems to be a requirement in the County’s TIS requirements, we do not believe the “access road condition analysis” is necessary for this proposal based on the proximity to Gallatin Road and there only being one proposed access point to this rural principal arterial.



Mr. Tom Rogers  
September 2, 2008  
Page 4

Compliance with Greater Bozeman Area Transportation Plan (2001 Update)

In reviewing the Greater Bozeman Area Transportation Plan (2001 Update), which is the currently adopted transportation planning document in the area, the following two projects were noted:

Chapter 3 - Proposed bicycle path along Gallatin Road (side not specified).

Chapter 10 - Project MSN 34 recommends that Gallatin Road in this area be reconstructed to a three-lane rural principal arterial (one travel lane in each direction and a two-way, center turn lane for turning vehicles).

Conclusion

As specified earlier, we'd like to reiterate that the TA and updated TA have been completed in compliance with standard traffic engineering methodologies and principles. Depending on the status of the overall project, an addendum to the updated TA may be warranted. There does appear to be a few items in the County's Traffic Impact Study Requirements (dated May 5, 2008) that have not been addressed. This predominately has to do with completing the traffic operational assessment out to the planning horizon in 5-year and 10-year increments, and also factoring in recently approved developments that may have not yet been built.

Please let us know if you have any questions regarding the review of this Traffic Assessment.

Yours Truly,

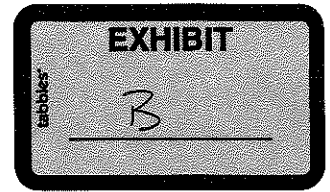
A handwritten signature in black ink that reads "Jeffrey A. Key". The signature is written in a cursive style with a horizontal line above the name.

Jeffrey A. Key, P.E.  
Senior Project Manager

cc: file

# Morgan Pit Neighborhood Meeting

Date: Wednesday, September 17, 2008



<u>Name</u>	<u>Address</u>
Jim Craenzel	1025 Zachariah Lane
Ruth Craenzel	1025 Zachariah Lane
Michael Lebwohl	730 3 Feathers Trail
Tom Starcher	350 Little Valley Road
Dewitt Ward	482 Zachariah Lane
Jane Ward	482 Zachariah Lane
Carol Lee-Roark	1550 Cottontail Road
Jim Brown	95 Gray Wolf Trail
Joyce Brown	95 Gray Wolf Trail
George Krizenawsky	216 3 Feathers Road

# Morgan Pit Issues

## ❖ Noise

- Back up alarms
- Crushers
- Mitigation
  - For Crushers, asphalt, wash plant etc.
    - Restrict hours of operation from 8 a.m. to 5 p.m. Monday thru Friday
    - No weekend operations except maintenance.
  - Back-up Alarms
    - Use adjustable and ambient-sensitive alarms or strobe light alarms.

## ❖ Hours of Operation

- Short term Hours of 6 a.m. to 10 p.m. excessive.
  - That's 16 hours daily residents will hear the operation.
  - Only leaves 8 hours to sleep in peace and that's if you want to live by their schedule.
  - No mention of how often these short term (3 months) hours can occur. 3 months of that noise for 16 hours a day will not seem short.
  - 8 a.m. to 5 p.m. should be plenty
  - Bet the short term hours occur every summer from June thru August.
    - Most likely time for families to be outside enjoying summer activities.

## ❖ Dust

- Dust control on roads inside pit area and from crushers etc.
- Insure dust control on stock piles whether the pit is not operating or not.
- Farmer's canal does not flow all year. Where will the water come from for dust control in the winter?
- Dust from this operation is continuous for 10 years in a small concentrated area. Farm dust, on the other hand, is not concentrated to a small or for as long a time.

## ❖ Contacts

- To report violations in pit operations.

## ❖ Property Values

- Loss of value up to 32%. Potentially hundreds of thousands of dollars for residents close to the pit.
  - For residents close to the pit that would wipe out any appreciation gain since buying their property.
  - This is especially hard on retirees on fixed incomes.

❖ **Duration of mining operation**

- If there is such a great demand for gravel in Gallatin Valley, why does the operation need to last 10 years. 5 years should be time enough to mine the gravel and would lessen the impact on residents.
- There are already several gravel pits within a few miles of the proposed Morgan pit. At least 2 of which are operated by TMC.
- If they concentrated on one pit at a time maybe could exhaust the pit in 5 years.

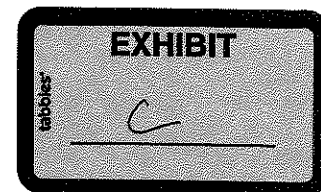
❖ **Medical**

- Stress and related medical problems caused by the noise and dust pollution is a major concern.

Rogers, Tom

---

From: cowboyjim43@aol.com  
Sent: Saturday, September 20, 2008 4:35 PM  
To: Rogers, Tom  
Subject: Thanks, Tom



Dear Tom Rogers,

Want to Thank you so much for coming to our home and meeting with the neighbors on Wednesday.

I am assuming that the Morgan Family Gravel Pit will move closer & closer to becoming a gravel pit.

Jim & I are hoping that the Gallatin County Commissioners will have enough understanding what will happen to the neighbors around the gravel pit that the GCC will force shorter hours, noise control & dust etc. We have enough gravel pits for the present time I would think.

I understand that highway 191 is still a big issue with a lot of people in the area. I do know that this is covered by new lanes to be installed. Hopefully, we will not have any deaths on 191 due to the Morgan Family Gravel pit.

**Property Values** will big a **big hit** for all of us. Even if we wanted to sell today we would have to disclose the fact of a gravel pit being built right behind us. Gravel pit owners do not care about this because it isn't there property involved No one in the area will be able to sell their places for what they are really worth. If we wanted to sell to get out of the gravel pit areas we could never replace this place due to the fact we would loose so much money on our present place. It would take someone who wanted to live right on top of all the noise,dust,long hours etc that the pit will create.

Seems to me this area has it share of pits. How many within a few miles?

Yes, Garth Sime & his family are neighbors. Garth did talk to Jim regarding the pit such as hours,NOISE, dust etc. We think the world of Garth & Carolyn. I understand if Garth hadn't agreed to build the gravel pit someone else may have.

Garth wants to say he'll try to cut down the noise,hours,dust etc. but will this really happen. What happens when/if TMC sells all their(assets) pits to another company. What happens to the neighbors?

Gary Perry, not sure why he thinks Morgan Pit is in a good place with 191 being one of the most dangerous highways in Montana. Gravel trucks are huge trucks to try to may a safe turn on 191.

Thanks greatly Tom.  
I will keep in contact with you

Joyce A. Brown

---

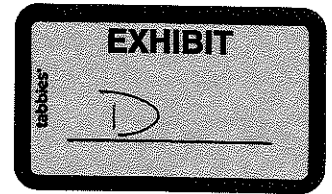
Find phone numbers fast with the [New AOL Yellow Pages!](#)



Rogers, Tom

---

From: Tom Fiddaman [tom@ventanasystems.com]  
Sent: Monday, October 27, 2008 8:19 AM  
To: Rogers, Tom  
Subject: comment on Morgan Pit application  
Attachments: RyggReviewMorgan.pdf



Dear Tom,

I've just received the Staff Report on the Morgan Pit CUP application. I was happy to see that it cites the Hite study and briefly discusses property valuation methods. However, I would suggest a slight amendment to the paragraph citing the Rygg study:

"There is limited geographically proximate research that can be applied in Gallatin County. The most relevant analysis, commissioned by MDEQ, titled, "*Gravel Pits: The Effects on Neighborhood Property Values*" (published in February 1998) did not employ the standard hedonic methods . This report employed sales comparison technique. As stated in the Applicants Submittal, this report found that gravel pit operations had limited, if any, negative measurable value effects on surrounding property. Data was culled from 1993 to 1998. "

The penultimate sentence should clarify that the Rygg study can only be interpreted as a failure to find an effect, not as a finding of a null or minimal effect. The study's methods are, unfortunately, irretrievably flawed. Also, as Rygg noted, the conclusions are not generalizable to other areas, because of the specific provisions for temporary use of the pit under study. I expand on the above in considerable detail in my comment to the DEQ, attached.

A subsequent paragraph notes:

"On the other hand, it should be noted the available data and analysis seems to suggest that the loss in property value is temporary. Upon full reclamation and the ceasing of the mining operation the real or perceived loss in property value is regained. As stated earlier the requested duration of the CUP is 10 years. For example, if a catastrophic event occurs to a family member whose home value is negatively affected by the gravel pit operation, and is forced to sell the home prior to end of the operation the result may be severely impacted during operations. "

I think there are good reasons to believe that this overstates the case. First, catastrophic events are not the only reason people move. Any restriction on a homeowner's ability to sell at any time is a negative impact with real value. Second, cessation and reclamation eliminate some proximate impacts (noise, dust, etc.). However, land development is path dependent, so negative impacts on property values could persist long after closure. During the 10-year period of operation, when property values are negatively affected, neighbors will likely build less and at a lower quality than they would have otherwise (because anyone who could afford higher quality would not build near a pit). After closure, the area would simply be not as nice a neighborhood as others, and thus would continue to be somewhat undervalued. I think this effect is evident in the development of the Rainbow Sub area discussed in my comment to DEQ.

Thank you for your consideration of these comments.

Regards,

Tom Fiddaman

To: Montana DEQ, DOR  
Re: Morgan Family Site draft EA, Rygg study, Fairbanks review  
From: Tom Fiddaman  
Date: 9/22/2008

I was recently made aware of an analysis that the DEQ and DOR have been citing to claim that gravel pits, power lines and other nuisance land uses have no effect on property values. Since this contention defies common sense and the peer-reviewed literature on the topic, I thought it would be useful to review the analysis to determine whether it had merit.

The analysis in question is *Gravel Pits: The Effect on Neighborhood Property Values*, prepared by Philip J. Rygg in 1998 for DEQ. The analysis was reviewed by DOR, as documented in a memo from Jim Fairbanks to Randy Wilke, April 6, 1998. The study and review have been cited in the Lake Helena-Valley Drive Gravel Pit draft environmental assessment, January 2008, and the Keller Site final environmental assessment, July 2007, among other places.<sup>1</sup> Most recently, it appears in draft EA for the Morgan Family LLC gravel pit application, to which this memo specifically pertains.

My background is in mathematical modeling for public policy and business strategy. I have a PhD in System Dynamics from the MIT Sloan School of Management. In 2006 I won the Forrester Prize, the highest honor in my field, for work on economy-environment interactions. Most relevant to the topic at hand, I am a co-inventor of the patented technology behind the RPX index of residential real estate prices, against which major financial firms write on the order of a billion dollars in contracts.<sup>2</sup> That technology involves mass appraisal of diverse properties, and careful discrimination of market price movements from noise. I am acting purely as a concerned citizen and not on the behalf of any individual, firm, or other organization.

---

<sup>1</sup> [http://deq.mt.gov/ea/opencut/HS&Gextended\\_LHVDEA.pdf](http://deq.mt.gov/ea/opencut/HS&Gextended_LHVDEA.pdf),  
[www.deq.state.mt.us/ea/opencut/KellerFinalEA.doc](http://www.deq.state.mt.us/ea/opencut/KellerFinalEA.doc)

<sup>2</sup> <http://radarlogic.com>

In my review I found the following:

- The Rygg study contains multiple technical problems that preclude its use as a valid measurement of property value effects, including:
  - The method of selection of comparable properties is not documented and is subject to selection bias, exacerbated by the small sample
  - The study neglects adverse economic impacts from land that remains undeveloped
  - The measure of value used by the study, price per square foot, is incomplete and yields results that are contradicted by absolute prices
  - Valuation adjustments are not fully documented and appear to be ad hoc
  - The study does not use accepted statistical methods or make any reference to the uncertainty in conclusions
  - Prices are not adjusted for broad market appreciation or inflation, though it spans considerable time
  - The study does not properly account for the history of operation of the pit
- The Fairbanks review fails to consider the technical content of the Rygg study in any detail, and adds general conclusions that are unsupported by the Rygg study, data, original analysis, or citation.
- Citations of the Rygg study and the Fairbanks review in environmental assessments improperly exaggerate and generalize from its conclusions.

These issues are not minor technicalities. They are major, debilitating problems that should lead a reasonable person to conclude that no confidence can be placed in the findings. No reputable academic journal would accept the Rygg study or Fairbanks review for publication.

By analogy, suppose that I am attempting to count woodpeckers. I scan the trees. No woodpeckers. Can I assume that there are none? Not necessarily. First, I must ask whether anything else is visible. If I can see only a blur, because my glasses are broken, then I remain in the dark about the woodpeckers. If I can see squirrels and pine needles, then it's fair to assume that, had there been any woodpeckers, I had a chance of seeing

one. But that is still not conclusive. Next, I must consider whether I've properly selected a study area that might contain woodpeckers, whether I've looked long enough and at the right time of day and year to see one, whether I know what a woodpecker looks like, and so forth.

The Rygg study, in effect, concludes "no woodpeckers" without performing these due diligence steps. Without adequate documentation it is hard to be sure after the fact, but it would appear that the study involved peering through the wrong end of the binoculars, in a wheat field, at night, and thus had little hope of detecting the effect it sought to measure. The Fairbanks review and EA citations uncritically repeat the rumor that the woodpeckers have gone missing, without ever wondering what the "tap tap tap" noise in the background might be.

While the legislature may have restricted the ability of DEQ to consider real estate values in its decision making, it did not require use of spurious evidence to falsely alleviate citizen concerns and mollify industrial interests. DEQ's continued citation of studies that contain no reliable information erodes its credibility and my faith in its will to protect the environment and public health.

Given the multiple problems with the Rygg analysis and its subsequent use, DEQ and DOR should cease all reference to the Rygg and Fairbanks documents, remove their citations from the Morgan environmental assessment, and for future reference commission a proper study of the economics of land use impacts of gravel pits.

Respectfully,

Tom Fiddaman  
1070 Bridger Woods Rd  
Bozeman MT 59715  
[tom@metasd.com](mailto:tom@metasd.com)

## Review of the Rygg report, Fairbanks assessment, and EA citations

Tom Fiddaman

9/2008

Review of the Rygg report, Fairbanks assessment, and EA citations.....	1
The literature on nuisance land use impacts.....	1
The Rygg analysis.....	2
The method of selection of comparable properties is not documented and is subject to selection bias, exacerbated by the small sample .....	2
The study neglects adverse economic impacts from land that remains undeveloped or underdeveloped .....	3
The measure of value used by the study, price per square foot, is incomplete and yields results that are contradicted by absolute prices .....	3
Valuation adjustments are not fully documented and appear to be ad hoc .....	3
The study does not use accepted statistical methods or make any reference to the uncertainty in conclusions .....	3
Prices are not adjusted for broad market appreciation or inflation, though the study spans considerable time.....	4
The study does not properly account for the history of operation of the pit .....	4
The Fairbanks review .....	4
Citations in environmental assessments.....	5
Lake Helena-Valley Drive & Keller Site .....	6
Nuss Site & Morgan Family Site .....	7
A suggestive counterexample, and options for proper study .....	8

### The literature on nuisance land use impacts

There is an extensive academic literature documenting impacts of various land use. It is beyond the scope of this memo to report on all of the findings, so I will merely provide two citations to review articles and a comment:

Melissa A. Boyle and Katherine A. Kiel (2001) “A Survey of House Price Hedonic Studies of the Impact of Environmental Externalities” *Journal of Real Estate Finance* 9(2)<sup>3</sup>

Stephen Farber (1998) “Undesirable facilities and property values: a summary of empirical studies” *Ecological Economics* 24(1)<sup>4</sup>

A common feature of most such studies is proper use of econometric and experimental methods, including use of adequate sample sizes and control of selection bias and other potential problems. While gravel pits have not been widely reviewed in the literature, results for other undesirable land uses (e.g., hazardous waste sites) and environmental

---

<sup>3</sup> [http://cbeweb-1.fullerton.edu/finance/jrel/papers/pdf/past/2001vol9n2/JREL9.2Review02.117\\_144.pdf](http://cbeweb-1.fullerton.edu/finance/jrel/papers/pdf/past/2001vol9n2/JREL9.2Review02.117_144.pdf)

<sup>4</sup> [http://dx.doi.org/10.1016/S0921-8009\(97\)00038-4](http://dx.doi.org/10.1016/S0921-8009(97)00038-4)

attributes (e.g., water quality) do show consistent negative effects, though the magnitude of those effects varies widely.

Orville Bach's 2008 memo, cited in the Nuss and Morgan Family Site draft EAs, identifies additional research specifically relevant to gravel pits.

### **The Rygg analysis**

The Rygg analysis uses the comparable sales method typical of pre-sale appraisals of residential real estate. The goal of a pre-sale appraisal is to establish the plausibility of a price to be paid, in order to protect buyers and lenders. To establish plausibility, an appraisal need only identify a few comparable sales, which after adjustment yield similar value. Unfortunately, this method is not up to the task of measuring effects of environmental changes like a gravel pit, especially over time, for reasons that are described below.

*The method of selection of comparable properties is not documented and is subject to selection bias, exacerbated by the small sample*

In general, appraisal methods of real estate valuation are subject to bias in the selection of properties. For example, when appraisers know the sale price of a property, they tend to select for comparables that justify a higher price, to ensure a sale.<sup>5</sup> The problem in the Rygg study is not so much that there might be a general upward bias, but that knowledge of prices and conditions in the area of the gravel pit may have consciously or unconsciously influenced the selection of comparables elsewhere.

Unfortunately, the comparable selection process is not documented in any detail, so it is impossible to determine how much effect selection bias might have had. However, there is cause for concern. Rygg notes (pg. 10) "each subject sale is compared to a grouping of comp sales that reflect a high degree of similarity to the subject sale, but which are located in neighborhoods without gravel pits" and that comparable sales "are located in unzoned areas of Flathead County that, in terms of economic forces, are reasonably similar to the neighborhood of the subject." This raises two opportunities for bias:

- Areas with similar "economic forces" may be affected by other undesirable land uses or land quality attributes.
- "Similarity to the subject sale" may inadvertently select for low-value properties elsewhere. This is especially problematic if FNMA appraisal guidelines were followed, which state that "The sales price of each comparable sale should be within the general range of the estimate of market value for the subject property."<sup>6</sup>

The problem of selection bias is exacerbated by the small sample size of the study – six subject properties with three to seven comparables each. This is not trivial compared to a typical pre-sale appraisal, but is quite small in a statistical sense. The small sample

---

<sup>5</sup> Wolverton & Diaz (1996) "An investigation into price knowledge induced comparable sale selection bias" [http://www.rics.org/Practiceareas/Property/Valuation/investigation\\_into\\_price\\_knowledge\\_19960901.html](http://www.rics.org/Practiceareas/Property/Valuation/investigation_into_price_knowledge_19960901.html)  
Andrew Leventis (2006) "Removing Appraisal Bias from a Repeat-Transactions House Price Index: A Basic Approach" OFHEO Working Paper 06-01, February 2006.

<sup>6</sup> See for example <http://www.dallasappraisal.com/images/fnma.pdf>

renders it easier to inadvertently select non-representative properties and increases the uncertainty of the results (as described below).

*The study neglects adverse economic impacts from land that remains undeveloped or underdeveloped*

As a thought experiment, consider a gravel pit surrounded by run-down mobile homes and vacant lots (this should not be difficult to imagine). Using Rygg's criteria, one might select comps from mobile home parks in other disadvantaged areas, neglecting 5-bedroom homes in nearby high-value neighborhoods. The comparison would likely yield similar per-square-foot values for the mobile homes, while ignoring huge differences in total values of land and improvements, even though a portion of that difference would likely be attributable to the fact that few sensible builders would locate expensive homes adjacent to an opencut mine. Similarly, the lost value of undeveloped lots, caused by the location of the pit, would also be entirely neglected.

It is not hard to see that a milder version of the situation above could apply to the study area. Of the six subject properties considered, two are mobile homes and none is as large as the average American home (unless basement areas are considered).

*The measure of value used by the study, price per square foot, is incomplete and yields results that are contradicted by absolute prices*

The goal of the study, as Rygg notes, is to measure economic obsolescence, the loss of market value from adverse environmental factors. Rygg cites *The Appraisal of Real Estate*, "Since economic obsolescence is not inherent in the improvements, its adverse effect on value may affect the land value, the improvement value, or both."<sup>7</sup> Price per square foot fails to take full account of possible effects, particularly on the land value component.

*Valuation adjustments are not fully documented and appear to be ad hoc*

Ordinarily, adjustments to comparable property values are reported on appraisal forms.<sup>8</sup> Unfortunately, Rygg does not report adjustments to comparables in his table of property attributes, and does not state detailed values or rationale for most comparisons in the text. Thus it is impossible to determine, after the fact, whether any of the choices are justifiable.

*The study does not use accepted statistical methods or make any reference to the uncertainty in conclusions*

Because Rygg does not report a comprehensive set of adjusted property values, it is not possible to draw any formal inference about the relationship between the subject properties adjacent to the pit and the adjusted comps. Statistical tests using the reported values fail to reliably distinguish between subject and comparable properties. For example, simple two-sample tests for difference of means with unequal variance yield null results for both price and price per square foot.

---

<sup>7</sup> American Institute of Real Estate Appraisers, Chicago IL, pg 258

<sup>8</sup> Ibid.

In an attempt to fully exploit the Rygg data that is available, I experimented with several linear and nonlinear regressions of price and price per square foot against property attributes. None yielded a statistically significant, or even sensible, result for the effect of location on value. For example, the simplest model (a linear regression against price) yields a gravel pit effect of -\$7300 to +\$25,500 (i.e., the measurement indicates that the mine is a benefit, but not reliably different from zero).

The conclusion one should draw from this is not that mines may be a benefit. When confronted with results that contradict common sense and economic theory, one should first ask whether the study is correctly measuring the effect in question. Are there opportunities for bias? (Yes.) Is the sample large enough? (No.) Do alternate measures, like price and price per square foot, yield consistent results? (No.) In this case, we must conclude that we remain uninformed about the effect.

*Prices are not adjusted for broad market appreciation or inflation, though the study spans considerable time*

Transactions cited span the period from 1993 to 1997. It is not clear what rate of appreciation prevailed in the area over that interval, but it is quite possible that timing of sales could significantly bias prices.

*The study does not properly account for the history of operation of the pit*

The causal effect of a gravel pit on property values is not a simple step response (open pit, drop values). It results from a complex interplay of factors that evolve over time. For example, the opening of a pit may cause an initial drop in value for existing properties, which subsequently grows over time as surrounding properties are developed to lower standards, or as owners fail to maintain their properties (because it isn't worth it to do so, given their diminished values). To some extent, the decline in value may precede the opening of the pit, if neighbors anticipate expanded operations.

To properly treat such interactions (and others, known as endogeneity bias) requires consideration of the timing of home and pit development. Unfortunately, no such consideration has been taken in the Rygg study.

### **The Fairbanks review**

The actual substance of the Fairbanks memo consists of a single paragraph, which simply restates the boundaries of the Rygg study, determines that it was complete, considers that price per square foot is an appropriate metric, and approves the adjustments made for lot size and improvements. It cannot be determined whether Fairbanks verified any of the data reported, except that it is noted that none of the properties were actually inspected. In particular, there is no evidence that Fairbanks checked the selection of comparable properties for bias.



In concluding comments Fairbanks quotes Rygg,

“Mr. Rygg determined that “None (of the sales within the environment of the gravel pit) were influenced by the presence of an operating gravel pit.”

So far as I can determine, this is not in fact an exact quote from Rygg’s analysis, but it captures the essence of Rygg’s conclusions. However, Fairbanks fails to note the limitations stated by Rygg on page 24, which are crucial to the interpretation of the results. An especially critical observation is that pit operations were transient:

“The buyers said that they did not anticipate the possibility that the permits could be extended and the operations expanded *and would not have bought had they been aware of this possibility.*” (emphasis added)

This suggests that a possible reason for no adverse finding is the expected brevity of pit operations. It also clearly invalidates generalizations from the experience at the subject pits to other situations with longer duration of operation.

Rygg goes on to say,

“The scope of this study is confined to the market’s expectation of the level of pit activity and length of continued pit operation as of the date each subject transaction occurred. Underlying the conclusions of this report is the assumption that the operation of the gravel pits will revert to their 1994-1996 level of activity, that they will not continue to be as active as they were during the highway construction of 1997. *A continuation of this peak level of operation could eventually erode neighborhood property values, although existing market evidence is insufficient to validate such a hypothesis.*” (emphasis added)

Again, it is clearly incorrect to conclude from this study that other pit operations would have no influence on property values – in fact, Rygg suggests the opposite, though he correctly notes that the study is not informative on the topic.

Nevertheless, Fairbanks goes on to comment,

"In the course of responding to valuation challenges of ad valorem tax appraisals, your reviewer has encountered similar arguments from Missoula County taxpayers regarding the presumed negative influence of gravel pits, BPA power lines, neighborhood character change, and traffic and other nuisances. In virtually ALL cases, negative value impacts were not measurable. Potential purchasers accept newly created minor nuisances that long-time residents consider value diminishing."

It is crucial to realize that this is merely Fairbanks’ opinion. It is not supported by the Rygg report or any other cited evidence. If other attempts to measure negative impacts were as flawed as the Rygg study, it is not surprising that impacts were not found. However, failure to detect impacts using inferior methods does not prove that impacts do not exist (and extensive literature using proper methods indicates that they do, as above).

### **Citations in environmental assessments**

As discussed in the previous section, it is incorrect to generalize from the Rygg study to circumstances elsewhere in Montana. Rygg himself pointed out a key limitation, unlikely to hold elsewhere: that buyers expected operations to be transient. Equally important, a study of a single locale is an absurdly small sample from which to draw statewide

conclusions. In any event, given the potential for selection bias and other technical issues, the most one should conclude from the study is that it failed to measure an effect (not that it measured a zero effect).

#### *Lake Helena-Valley Drive & Keller Site*

Citations of the study in the Lake Helena-Valley Drive Gravel Pit draft environmental assessment and the Keller Site final environmental assessment give a different impression. The Lake Helena draft EA states:

##### 5. Property Values (EA Section 15)

COMMENT: The operation will decrease property values in the surrounding residential area.

RESPONSE: Sale or market value of adjacent property has not been shown to be negatively affected by the presence of a gravel pit and associated operations (Rygg 1998). In any case, under the Opencut Mining Act DEQ has no authority or jurisdiction over property value issues.

This gives the reader the impression that a concrete finding was reached, when the result should in fact be regarded as “no information”. It also fails to note that the Rygg study is likely of no relevance to the Keller Site.

The Keller Site EA goes farther:

14. LOCAL AND STATE TAX BASE AND TAX REVENUES: Will the project create or eliminate tax revenue?  
Sale or market value of adjacent property may be negatively affected by the presence of a gravel pit, but DEQ has no specific information on this issue at this site. ...

So far, so good. Continuing a few sentences later,

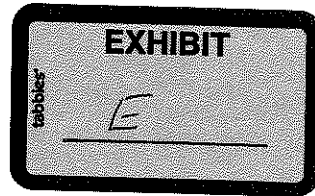
Several years ago, DEQ contracted a study to determine “whether the existence of a gravel pit and gravel operation impacts the value of surrounding real property.” The study (Rygg, February 1998) involved some residential property near two gravel operations in the Flathead Valley. Rygg concluded that the above-described mitigating measures were effective in preventing decrease in taxable value of those lands surrounding the gravel pits.

Not so fast. Rygg assumed that mitigation measures would be taken as specified in the permit, but drew no conclusions about whether it was mitigation, transient operation, scale of operations, or any other feature of the pit or study methods that lead to an unmeasured decrease in value.

## Rogers, Tom

---

**From:** Riley, Jean [jriley@mt.gov]  
**Sent:** Monday, October 27, 2008 3:26 PM  
**To:** Rogers, Tom  
**Cc:** Ebert, Jeff; Bukvich, Robert  
**Subject:** RE: Morgan Gravel Pit CUP Application Staff Report



Tom,

MDT only had one concern with the report. On page 27, No. 19 you reference the need for road signage. I am not sure was you are anticipating here. US 191 must be modified to include a south bound left and north bound excel and decel lanes. With the additional lanes, the Traffic and Safety Bureau Staff do not feel signage would be necessary.

If you have any questions, please call me.

Jean Riley  
(406) 444-9456

---

**From:** Rogers, Tom [mailto:Tom.Rogers@gallatin.mt.gov]  
**Sent:** Wednesday, October 22, 2008 3:44 PM  
**To:** Riley, Jean  
**Subject:** Morgan Gravel Pit CUP Application Staff Report

Jean,

Per our conversation this morning I have attached a copy of the Planning Board Staff report for your files. You will not receive a hard copy, however, you will receive a second Staff Report for the County Commission hearing scheduled for November 5, 2008.

Thank you again for your comments.

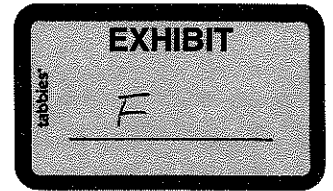
Sincerely,

Tom Rogers  
Planner, Gallatin County Planning Department  
311 West Main Street  
Bozeman, MT 59715  
(406) 582-3130  
(406) 582-3135 fax  
[tom.rogers@gallatin.mt.gov](mailto:tom.rogers@gallatin.mt.gov)

## Rogers, Tom

---

**From:** cowboyjim43@aol.com  
**Sent:** Tuesday, October 28, 2008 11:08 AM  
**To:** Rogers, Tom  
**Subject:** 3 Pits within 20 mile production of gravel



Hello Tom,

As I read the Staff report wondering why there would be 3 gravel pits for TMC within their 20 mile production of gravel sites for hauling their materials doesn't make any sense. There is the **Storey Pit**,

**Nuss Pit** operating & the new one the **Morgan Pit**. TMC also owning the pit off hwy 90 & the other one off airport rd.

What's the deal, why would the county even allow that many pits so close together.

It's time to put these pits somewhere near the corner of the county lines that could making hauling gravel even closer as the county develops outward towards the county lines.

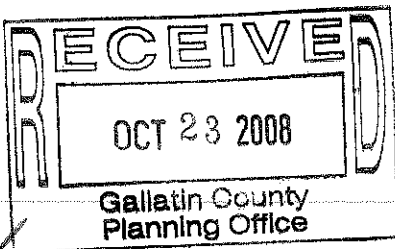
Or, even better yet, Have these Gravel pit owners purchase the Mandeville property. Perfect place for a gravel pit. there is Knife River & TMC. That makes it a sure thing that there is gravel on the Mandeville property (by Murdochs) and close to the highway's.

Thanks Tom for all your great help.

Joyce A. Brown

---

McCain or Obama? Stay updated on coverage of the Presidential race while you browse - [Download Now!](#)



Oct. 22, 2008

Planning Dept.

I am writing this letter in consequence of the Morgan family gravel pit.

I live on the far south side of the Morgan property. It is my understanding that the pit will be on the north side of the former canal. It wouldn't effect me to much if it was on the north side but if it was allowed on the the south side it would effect the value of my property alot.

It would also be very important to keep the 25 ft. dept so it ~~can~~ be retained. If by chance the pit was allowed on both sides of the canal it would be a disaster if the canal ever broke out.

Sincerely yours,  
Gary Ward

580-4488

## Rogers, Tom

---

**From:** cowboyjim43@aol.com  
**Sent:** Wednesday, October 22, 2008 12:31 PM  
**To:** Rogers, Tom  
**Subject:** Hwy 191 - Morgan Family Gravel Pit Stretch

Hello Mr. Rogers,

Hope your day is going well.

I am asking the Gallatin County Commissioners to take a lot of **THOUGHT** regarding the gravel trucks exiting and entering Hwy 191.

We do know the MDT has required the Morgan Family Pit to re-do the highway for safety.

I was shocked when Jim & I were driving south on Jackrabbit lane near Valley Center drive when a Semi Truck hauling gravel with a large trailer on it turned right in **front of us** with several cars directly behind us.

Just for your information- It took that gravel truck and trailer 2 miles to get up to 50-55 miles an hour. By that time the gravel truck was at 4 corners & had to stop for the lights.

Hopefully the Gallatin County Commissioners will take a "Really Hard" look at this very dangerous situation. I think I remember the commissioners(maybe it was Jim Lynch on the radio advertisements) to drive carefully and what happens, a gravel pit soon on HWY 191.

Mr. Rogers, please discuss this with the Commissioners. It is very important.

Thanks for listening.. No response Necessary.

Joyce Brown

---

McCain or Obama? Stay updated on coverage of the Presidential race while you browse - [Download Now!](#)

# Betty Conard

1891 STAGECOACH TRAIL RD. MANHATTAN, MT 59741  
TEL 406 282-7573 FAX 406-282-7573

scriptcasting@aol.com

September 24, 2008

**Jo Stephen**  
Reclamation Specialist  
**DEQ-Opencut Mining Program**  
Airport Business Park  
1371 Rimtop Dr.  
Billings, MT 59105-1978

Dear Jo,

I reviewed both of the draft Environmental Assessments for the **Morgan Family, LLC pit and the Nuss-Rock pit**. In my opinion, there are some additional considerations which need to be addressed. They are as follows:

1. Ground water monitoring statistics throughout the early spring runoff and summer irrigation season of 2008 were not included. At a minimum, they should have been collected at least once a week. This was a very high water year and it's critical data to include when making an informed decision regarding the actual depth to ground water. Previous to this year, we were in drought conditions so those older statistics would not be representative of the actual water table.
2. The Gallatin county AGAI group needs to be actively involved in the consultation and review segment in the decision making process regarding irrigation ditch setbacks and irrigation water rights use changes. This is in addition to the involvement of the DNRC. Additionally, I have heard it mentioned that irrigation ditch setbacks should be much larger than the 75 ft. mentioned in the EA.
3. The changing of agricultural irrigation water rights to large industrial complex use requires in depth scrutiny because it has the potential for enormous impact throughout the State of Montana. Surface and Groundwater rights are linked according to Montana law. This area is a closed basin regarding water rights. Nationally, other states are looking for additional water from the upper Missouri river basin.
4. Water Concerns - The Nuss-Rock pit is extremely close to the Gallatin River and expects to mine to a depth of 89 ft. The river water/hydrology relationship needs to be revealed, studied and addressed in depth. And, the pit expansion will definitely have an impact on Fish Creek (trout/spring creek natural habitat). Both of these issues need to be thoroughly examined with extensive hydrology and groundwater flow studies as well as an Environmental Impact Study. These studies will answer the unanswered questions left by the draft EA. The public, trout/fish habitat supporters, agricultural irrigators and Gallatin River advocates/users deserve to have their concerns answered completely.
5. Specific engineering plans showing the exact layout for each of the expansion phases is a valuable tool for the public to visualize the changes & impacts of these large industrial complexes. One of the EA's had some information regarding this while the other one did not supply such plans. Asphalt plants also need to be shown on the plans.
6. Asphalt Plants - There is no real specific information provided regarding this component for both of the operations. The asphalt plants will have very significant impacts to each and every neighbor as well as traffic on the state and county roads. More information needs to be provided to the public regarding what company, # of employees, # of trucks, stockpiling of old materials, manufacturing on site, safety & compliance records, road impacts, etc.

7. Neighbor's Home & Land Values - The data provided from 1998 is absolutely outdated and does not pertain to the Gallatin Valley's situation. It would be helpful to approach the GAR - Gallatin Association of Realtors, to do a study which would provide accurate information regarding accurate housing current listing prices and sold values for homes and land nearby. This could be broken down into areas closer to the proposed pits and then expanded out to a 3 mile radius. Additionally, the GAR could provide financial information regarding what those same homes will list for if the gravel pit is permitted and becomes active. The obvious loss of value will then be documented in order to reconsider tax basis, evaluate the true "cost" to the area for the gravel pit, and determine what financial responsibility the gravel pit owners may have in trying to mitigate the negative impacts for the neighbors. It may well be that areas where gravel pits are approved may need to simultaneously apply for area zoning changes to industrial/commercial use because of the financial losses to neighbors, etc.

8. Phases & Expansions - Phases and expansions need to go through review as each one is implemented. It is not desirable to approve projects that last 10 or 20 years without a thorough in depth public review for each phase. Specific compliance and/or violation records need to be presented to the public at the time of review. Some people have requested that earlier phases need to be reclaimed prior to the approval of expansion phases. The public and county need to have some input at the time of each expansion because of the rapid pace of changes in the area.

Thank you for your time. I look forward to seeing each of these issues specifically addressed and resolved.

Sincerely,



Betty Conard