Gravel Replenishment Deficit on 9MR Roads
1996 - 2018

Created and written by Kirk Johnson and reviewed by Brett Coffman (2/19/19).

This report considers the apparent fact that gravel on Ranch Roads has not historically been replaced as fast as traffic has been wearing it away, and how that conflicts with the CCR requirement that the HOA maintain[1] roads. **Summary**: According to qualified[2] analysis and calculation, at today's prices Ranch roads are in need of $53,763 worth of gravel replenishment that has not yet been fulfilled throughout our 23 year history. The following information shows how the total figure was arrived at.

I year	II autos per day[3]	III actual spent per year on gravel, w/tx	IV total $ should have spent on gravel	V real $ difference that year	VI deficiency/surplus adj. to today's $
2018	4.983	$8283	$12,269	<$3986>	<$3986>[4]
2017	4.7565	$3016	$6669	<$3650>	<$3739>
2016	4.53	$3955	$8142	<$4187>	<$4380>
2015	4.3035	$3955	$7735	<$3780>	<$4005>
2014	4.077	$3955	$7328	<$3373>	<$3578>
2013	3.8505	$3955	$6921	<$2966>	<$3197>
2012	3.624	$3955	$6514	<$2559>	<$2799>
2011	3.3975	$3955	$6107	<$2152>	<$2402>
2010	3.171	$3955	$5700	<$1745>	<$2009>
2009	2.9445	$3955	$5292	<$1337>	<$1565>
2008	2.718	$147	$4902	<$4755>	<$5546>
2007	2.4915	$130	$4328	<$4198>	<$5084>
2006	2.265	$115	$3826	<$3711>	<$4622>
2005	2.0385	$100	$3335	<$3235>	<$3048>
2004	1.812	$9437[5]	$2563	$6874	$9137
2003	1.5855	$73	$2444	<$2371>	<$3236>
2002	1.359	$62	$2049	<$1987>	<$2773>
2001	1.1325	$50	$1680	<$1630>	<$2312>
2000	.906	$39	$1307	<$1268>	<$1849>
1999	.6795	$28	$948	<$920>	<$1387>
1998	.453	$19	$618	<$599>	<$923>
1997	.2265	$10	$304	<$294>	<$460>
1996	0	0	0	0	0
				TOTAL GRAVEL DEFICIT	**<$53,763>**

1 The 9MR CCRs, at Article V, Section 1, require that Ranch roadways are to be at least "maintained". According to recent legal counsel, among other maintenance aspects, the Board is required to at least replenish road gravel as it wears out from road traffic... but what if there's not enough money to do that? Per legal counsel, the Board is required to ask for the necessary funds for gravel replenishment from the Association membership, and if the membership denies funding then that releases the HOA from being legally liable for overcoming the maintenance gravel deficit that currently exists; in other words, no one can sue the HOA for not maintaining replenishment gravel if the membership votes to not fund it.

2 Kirk Johnson's relevant qualifications: 25 years professional price estimator in construction and earth work, 7 years of that directly regarding Ranch roads. Brett Coffman's relevant qualifications: 30 years in earthwork and utilities, performing public infrastructure and road construction.

3 It is common in civil engineering and municipal reports about road wear to determine total road wear based upon average daily traffic. Once there is a daily traffic level identified for one time period and applied to an amount of road wear observed for that time period then that level of wear can be adjusted as either greater or lesser proportionately according to greater or lesser daily traffic for other time periods. In 2016 this author analyzed and reasonably determined (click here for that report) that at that time there were "4.53 cars per day driving over all 36 miles of roads", a.k.a. 163.08 total miles driven per day on Ranch roads (4.53 x 36 miles).

4 This amount of deficit is currently scheduled and budgeted to be made up in late spring 2019 by installing that amount of gravel, so at the time of this report it had not yet been acted on.

5 In 2004 this author conducted the actual installation of this amount of gravel, so I have personal notes about the gravel placement and amounts for that year.

- The blue numbers are all the same because they are an average of (8) years' expenditure records for those years, all adding up to the actual total of gravel expenditures for those years. The average was created for earlier Board reports involving assessment raise analysis, so they're conveniently used for this report.
- The pink numbers are the 'benchmark' for having determined the Ranch's "autos per day" (APD) traffic level on the Ranch as of 2016. From there all other APDs for each year were extrapolated as discussed at bullet #2 under "Columns Calculation Description" below. Click here to view the creation of the benchmark calc.

General History Reflected Above

1. Ranch roads have been being used for 23 years.
2. Actual gravel expenditure records exist for years 2004 and for 2009-2018. There are no official expenditure records for the other years (1997-2003, and 2005-2008), however, either this author or long-time sole road contractor Tim Roberts were witness to or directly involved with the 'missing years' road maintenance and they cumulatively attest that during those years the only gravel placed were small amounts to infill dust spots that happened to show up; in other words, that small amount has been estimated and incorporated into Column II for years 1997-2003 and 2005-2008 (numbers shown in green) in a graduated fashion cohering with the traffic rate increase (they all total to $773.00, which is the cost amount of about (9) truck loads of local pit run at the rates charged during those years).
3. Actual costs per truck load of gravel were between $85-$100 from 1997-2003. 2004 represents a specific large placement of replenishment gravel conducted by this author, such average price per load which was $165. 2009-2016 average prices per truck load were $223.00. 2017/2018 average prices per truck load were $175.00 per load. 2018 average price per truck load was $306.00 per load.

Columns Calculation Description

- Column I: Total years Ranch roads have been driven.
- Column II: Each entry in the column references from the 'benchmark' of 4.53 APD in 2016. There are 20 years of traffic from 1996 (first year of traffic) to 2016 (20th year of traffic). If 100% of traffic rates occurred over 20 years then that means 5% of traffic rate change happened each year (5% x 20 = 100%). We do not have measured traffic rates for each year; only for 2016 (the 20th year) and for the starting point (1996 = 0 traffic). Therefore, the most reasonable and accurate traffic rate change calculations we can make is to say that from zero in 1996 the rate increased by an even 5% each year all the way up to the benchmark in 2016, and then increased years 2017 and 2018 by 5% each year beyond that.
- Column III: See description at "General History Reflected Above", item #2.
- Column IV: All years are based on starting with 'benchmark' 2016. From there each year was changed by 5% per year to reflect the traffic rate increase/decrease per year. Then that adjusted figure was changed to reflect the actual inflation rate for that year. So the final number reflects the gravel wear for the traffic rate for that year, and the actual cost at that time for gravel.
- Column V: These numbers are Column IV (total $ should have spent on gravel) minus Column III (actual $ spent per year on gravel) = Column V (real $ difference that year).
- Column VI: These numbers are Column V adjusted to today's dollar value (using the official federal inflation calculator), given that it is 'today' that we would have to purchase the gravel to replenish what was neglected in the past. All these numbers add up to the Total Gravel Deficit of $53,763.00

2019 Road Work List
version 3 (9/1/19)

Summary

Brief expenditure summaries:

- List seeks to work up to and within the recent cash-flow and budget our Treasurer created about Road Maintenance, which corresponds with the July BOD motion, which is a total of $15,000.00. On August 31, 2019 the Special Assessment passed for a rake and gravel purchase which will add approximately $2000 to the $15,000 being able to be spent on prioritized road maintenance, so those expenditure decisions will be forthcoming.
- The gist is this: The July heavy rain created unusual damage and added critical repair costs to contend with. Altogether, our $15,000 budget is projected to get filled ditches cleared, culverts cleared, several heavy erosion spots dealt with, and most road sections that were washed flat can have crowns restored to them, and this includes a $1000.00 buffer for overages. It also includes fall raking and a couple of the worst ditch erosion spots repaired. There are no general gravel placement expenditures provided within our $15,000 budget; gravel placement is secondary in priority to critical watershed maintenance and there is not enough money to spend on gravel at this time. Regarding gravel, as can be seen in the Treasurer's August 14, 2019 Update of Cash Flow which includes $15,000 for road maintenance, we are projected to end this fiscal year with approximately $14,000 left in cash-on-hand (as long as plowing and other categories don't go over budget); it is proposed that with our severely limited budget we wait until spring to spend remaining cash-on-hand on gravel placements. Because of the 8/31/19 passing of the Special Assessment which will allow new additional gravel expenditures, some of #2 priority items on the list which involve gravel placements may be acted on.
- The reader will note that next to each work item under Divisions below there is a number 1-3 and then a dollar amount. The number designates the priority from highest to lowest for performing the duty, and the dollar amount is of course the projected amount to perform the duty. Priorities #1 all deal only with critical watershed repairs (culvert cleaning, road crowning, road plane erosion control and repair, then ditch erosion control repair). Priorities 1.5 are erosion control measures/repairs that are strongly needed but take an immediate back seat to #1 when pressed to have to make budget choices. Priorities #2 are next and involve more extensive ditch erosion control and road plane erosion repair/crowning (adding gravel to assist). Priorities #3 are lowest and involve capital improvements and other items that stand out as needed maintenance or improvement.
- Work List totals:
    - $10,450.00 All #1s
    - $839.57 sales tax on #1s
    - $1000.00 expenditure buffer

      $12,296.45 total above
    - $2954.00 All #1.5s
    - $239.27 sales tax on #1.5

      $15,489.72 TOTAL

- All of the above fits within the budget. The following Work List items do not fit into the budget:
  - $26,359.10 all #2, with sales tax
  - $29,087.55 all #3, with sales tax
  - other gravel expenditures, including yearly gravel replenishment due to wear from traffic.
- All work items were assessed in May 2019 and revised again in late July/first week of August after the severe rain storm most of the Ranch endured. The List will be modified as work and the season progresses. The List is not meant to be an absolutely complete list of all possible road work items desired throughout the Ranch but rather seeks to highlight especially the main priorities within current plausible budgets. All #1 and #1.5 work items on the list have been scheduled and planned with work contractors and work will commence from late August forward. The Road Committee has decided that while it is not desirable to work on roads when road conditions are relatively dry we will commence work nonetheless, as it is possible there may not be better ground moisture before snow comes and it is important to make sure critical watershed tasks are completed going into winter. Road Committee representatives will monitor work as it progresses and consider halting work if conditions are just too obviously negative.

General Notes to Work Contractors

- Call for locate for power lines for ALL ditching before pulling ditches! Contractors are not expected to administer this free of charge, so if such work is performed we will expect charges for man hour labor and travel mileage if necessary to deal with locating.
- All gravel placement should be laid to promote center road crowning. This means that if the product will not be machined after placement to create crown then truck spread the product by ½-lapping two runs down the center of the road, or one load straight down the center, depending upon preferred circumstances.
- Place safety 'road work' signs up where prudent (blind sight areas especially).
- If possible and affordable, grade up hill, to promote restoring road product that has eroded down hill and to maximize grader machine operation capability.
- Many roads do not have good gradable top coat gravel for a grader, so if the grader work asked to be done involves crowning, restoration, and ditching because there are bad existing watershed properties then please proceed with grading. But if water sheds OK as-is and the road will suffer because the grader will dig up the bouldery surface then please don't grade.

<u>Division 1</u>

1. **#1.5 / $1350.00** At .2 miles down Point Drive from where it intersects with 399 Nine Mile Road: fix erosive conditions on some sandy embankments above the ditch. Reestablish ditch, install (2) loads of rip rap in the ditch and up the embankment where obvious sloughing has occurred recently and washed through the culvert. Likely using a hoe?
2. **#1.5 / cost included in #1 above** If #1 above involves the hoe, use the hoe to clear some of the siltation in the ditch on the outlet side of the culvert in #1.
3. **#1 / $95.00** Machine clear the culvert outlet at the intersection of Sunset Ridge and Canyon

View.

Division 2

No immediate repair work identified. Due to severe budget constraints we have placed the following potential work items on Allen Drive on a low priority status:

1. Ideally deepen a few short sections of ditch.
2. Improve some sections of road crowning to improve watershedding to the sides of the road. The original road construction in this region needs to be raised and crowned by placing additional gravel down the center of the roads in order to improve any watershedding characteristics without deteriorating the road edges gravel to a muddy point (in other words, if we try to grade a crown to the center by cutting the road edges we'll remove/destroy the existing surface gravel in the edges and expose a fair portion of the road to subsoil erosive muddy conditions). The road needs installation of thick layers of appropriate-sized road gravel in the center of the road; this will preserve road edge gravel (erosion resistance and traffic bearing capacity) and will give elevation to the road such that ditches can be effective. This would also allow the potential installation of a culvert at a flat/low spot at about .46 Allen Drive, but the small amount of watershed in this area (and therefore the small amount of negative impact to the road) renders this improvement low priority.
3. Due to original road construction relative to the region's soil composition and high water table, pretty much all of Division 2 roads are in lower capacity to support traffic weight; in other words, they're prone to being mushy when wet compared to other typical Ranch road sections. In order to cure this we'd have to install many tens of thousands of dollars of larger road ballast gravel and then a top coat; such an endeavor will be kept in mind and may be acted on in short sections over a period of many years.

Division 3

1. Ditch with grader (and any associated road plane erosion/crown repair if the material in the road can bear it):
    1. **#1 / $590.00** On Wagon Wheel, from .46 and further approximately .25 miles, reestablish the ditch and crown and fix road plane erosion.
    2. **#1 / cost included above** Reestablish ditch on first .20 miles of Wagon Wheel, below the steep grade.
2. **#2 / $1308.00** Install (4) loads of 5/8”-minus on Wagon Wheel, from .46 and further approximately .25 miles wherever most needed.
3. **#2 / $729.00** On the first grade of Wagon Wheel just off of Nine Mile Road, starting at approximately .15 where the road planes flat and turns right, going downhill from there install (1) load of Chris Wolley 1 1/4”-minus down the center of the road and then come back over that with (1) load 5/8”-minus. Walk down with truck.
4. **#2 / $196.00** Install approximately 1.25 cu. yards of 5/8”-minus in a sump spot in Wagon Wheel at the top of the grade at about the .3 mile mark (contact Kirk for access to this small amount of needed gravel). This is probably a job involving hand shoveling and placing the gravel. Pack the grave; placement with a car/truck.

Division 4

1. Ditch with grader (and any associated road plane erosion/crown repair if the material in the road can bear it):
    1. **#1 / $1550.00** On Sunset Ridge, starting about .2 miles up from the Old Tressle intersection and going approximately 200' up road.
    2. **#1 / cost included above** Cut a ditch across the private driveway on Old Tressle road about .15 miles east of the Sunset Ridge intersection, on the north side of the road (obvious washover spot).
    3. **#1 / cost included above** Cut a ditch across the private driveway on Old Tressle road at .29 miles west of the corner where the giant residential rockery is, and grade out any needful washover in the general area.
    4. **#1 / cost included above** Restore ditch at top of Pine Bluff just below and up to where it intersects with Old Tressle.
    5. **#1 / cost included above** Cut ditch across private drive washover at “44 Pine Bluff”, smooth out the erosion across the road if the grader can do it.
    6. **#1 / cost included above** Restore ditch on the first grade of Pine Bluff, about .2 miles from Chesaw Road.
    7. **#1 / cost included above** Restore ditch on Pine Bluff at about .35 miles up from Chesaw Road.
    8. **#1 / $650.00** On Point Drive, at .30 from Nine Mile Road across from Wagon Wheel Division 3, restore the filled ditch going down the slope into the gulley, grade the road in this area to what degree it needs any crowning and will not excessively pull up road base by using a grader.
    9. **#2 / $981.00** On point Drive, at about .85 from Nine Mile Road (just above the Eagles Nest intersection) install (3) loads of 5/8”-minus gravel crowned in the center of the road. This will elevate the road section to allow better installation and maintenance of ditches.
    10. **#1 / cost included above** On Point Drive at about .60 (starting just past the intersection with Crest Drive) restore the filled ditch, and continue up through to intersection with Meadowlark Spur as needed and able.
    11. **#1 / cost included above** Restore the ditches and repair road plane erosion on the steep grade on Crest Drive.
    12. **#2 / cost not yet estimated** If buried power and phone lines in the shallow ditches allow, potentially install ditches in a very short section at the top of Crest Drive (prior long-time work contractor Tim Roberts has repeatedly refused to perform this ditching in the past because of his alleged knowledge of shallow lines). Most of Crest Drive was originally constructed on surfaced bedrock, is extremely narrow, and has steep erosive embankments, all of which caused the developer to choose to install power and phone very shallow in ditches in this area. Further, the local watershed area (potential volume of water flow) is very small and at the end of a road... all of these these factors place this potential work item as a lower priority.
    13. **#1 / $250.00** Restore the ditches and repair road plane erosion between .15 and .55 on Old Tressle from the Chesaw Road.
    14. **#2 / $5050.00** Restore ditches and repair road plane erosion between .7 and .95 on Old Tressle from Chesaw Road. This area of repair is unique, as it involves controversy over

the owner of Lot 20 (Division 4) literally killing barren approximately 1.5 to 2 acres of that Lot – which has been maintained like this for 10+ years (?) – therefore causing that land section to have severely reduced erosion resistance capacity and in turn burden the ditches, roads, and culverts in the area with excessive water flow amount and speed, and also excessive siltation from the land and erosion in ditches. Minimum current repair recommended for the easement:

1. install (6) loads of rip rap shale in approximately 300 lineal feet of deeply eroded ditch, deliberately machining in place the rip rap to armor the ditches durably.
2. Grader work to facilitate, if necessary. No gravel placement is included.

2. Using (2) loads of rip rap:
    1. **#1.5 / $950.00** Install approximately 150' lineal feet of eroded depth ditch on Sunset Ridge, starting about .2 miles up from the Old Tressle intersection.
    2. **#1.5 / cost included above** Install remainder of rip rap into a downhill embankment erosion spot on the south side of Old Tressle about .15 miles east of the Sunset Ridge intersection.
3. **#1.5 / $654.00** Install (2) loads of 5/8”-minus at the top of Pine Bluff to restore some of the recent erosion.
4. **#2 / $725.00** Install (2) loads of 5/8”-minus at about .35 Pine Bluff, just below the bend in the road where the double wide modular and garage driveway entrance is, to restore crown on road.
5. **#2 / $150.00** Using a hoe remove the recently dropped timber slash that is cluttering the ditch at the .1 mile point of Old Tressle from Chesaw Road.
6. **#2 / $3300.00** Install (12) loads of either 5/8”-minus or the same amount of machined pit run on an approximately 500' section of Point Drive; this would be installed on the most needful stretch in the first ½ mile from Nine Mile Road.
7. **#2 / $550** Install (1) load of rip rap in the deeply eroded ditch at .30 on Point Drive from Nine Mile Road (grader repair for this ditch area is enumerated at 1.7 above).
8. **#2 / $981.00** Install (3) loads of 5/8”-minus on Point from just past the Eagles Nest intersection up through to the Meadowlark Spur intersection.
9. **#2 / $327.00** Install (1) load of 5/8”-minus on the eroded slope of .40 Old Tressle from Chesaw Road.
10. **#2 / $600.00** Install 1-2 loads of rip rap in the eroded ditch at .40 Old Tressle Road.

<u>Division 5</u>

1. Ditch and grade with grader:
    1. **#1 / $375.00** Reestablish various ditches throughout the creek crossing ravine area, and grade the road for smoothing and crowning.
    2. **#1 / $550.00** Restore ditch, repair erosion and road crowning on Canam Road about .25 miles west from the Blue Grouse intersection. This is through a steep embanked and erosive winded area of road.
2. **#3 / $14,000** Approximately 200' from the culdesac at the end of Mallard Drive there is a 250' stretch of road that is extremely narrow and is a winter snow plowing and driving safety hazard. The uphill embankment side of the road is encroaching the road width with siltation, and the downhill embankment side is erosive; together these dynamics have narrowed the

road significantly. Solution: excavate the uphill embankment 7' inward and transport the fill to a nearby roadside storage spot for future fill use (some of the fill can be brought and placed at the culdesac to increase it's turning diameter, as it is currently narrow). For information-sake, the measured and calculated volume of dirt is (130) 10-yard dump truck loads, x 40 minutes to excavate and transport each load, x $150.00 per hour = $13,000. Then add another roughly $1000 for machine time and gravel to get the road stabilized again.

3. **#2 / $1925.00** Raise low road section at approximately .2 miles down Meadowlark Road from the Mallard Drive intersection: Use a combination of harvested fines from the creek ravine (some piled already by the silver tarp, and the rest to be harvested from the sloughage at the obvious steep erosive embankment on the south side of the creek) and layer that with harvested roadside ribbons of large pit run from Mallard Drive roadside between 1.5 and 1.75 mile points. Grade to mix layers, and truck pack as necessary.
4. **#2 / $570.00** Fill low spot in road on Meadowlark Road at approximately .5 mile spot, just past the residence that has the garage right next to the road. Use either a pit run with fines of layer one load of larger pit run with creek ravine fines sloughage. Grade and truck pack as necessary.
5. **#2 / $735.00** Install (2) loads of 5/8”-minus on the steep boulder-laden slope at the 1.5 mark point of Mallard Drive at the intersection with Meadowlark road. Truck pack as necessary.
6. **#1 / $1455.00** Fix deep erosion ditch just above the cattle grate on Mallard Drive at approximately .2 miles past the intersection with Blue Grouse: hoe dig a 2' deep ditch where the ditch belongs, place that removed material in the erosion channel in the road, truck or hoe pack that, then place approximately 1.5 loads of rip rap in the ditch to prevent future erosion. Place the remaining rip rap in a pile, for future use, at designated spot jjst above the cattle grate on the southeast side of the road (consult with Kirk before placement, as this area is used for other reasons also that we do not want to thwart). Place (1) load of 5/8”-minus down the road, for crowning and road restoration (substitute for a larger diameter product if it seems the road needs more ballast because its too soft from the ditch restoration).
7. **#3 / approximately $25,000.00** There is a section of Mallard Drive between mile .9 and 1.2 – going through some flat land – that has (3) sections of road that were originally constructed lower than the surrounding watershed level. This same condition exists for an adjacent Blue Grouse Road section. Over the years this has resulted in these sections being subject to washover by run-off. This means that in these sections (in their current construction) ditches and culverts would be physically unable to function if they were installed, so in order to cure this we need to raise the roadbeds by about 12” and install several culverts. Historically the consequence of this current negative condition has been no more than drivers having to drive through some occasional standing or overflowing water and has not resulted in blockage of roads or undue repair costs, and it has left several uncomfortable pot holes and depressions in the roads where washover occurs. While we would like to install some topcoat gravel and also potentially fill in the potholes/depressions, such expenditures are somewhat futile without raising the roadbed height first (water just keeps running over the same areas, and expensive topcoat gravel would just get covered over one day when the roadbed gets raised). So the desired plan at this time is to over the years take a short section at a time and raise it with appropriate ballast layers and finally install a top coat, as budgets allow.

Division 6

1. **#2 / $981.00** Install (3) loads of 5/8”-minus in a thin lift on top of the most boulderhead-showing stretches of Corral Drive.

Division 7

1. Ditch and grade with a grader:
    1. **#1 / $250.00** On Horse Trail Drive from .25 to the end, reestablish ditches, crown the road, and repair road plane erosion.
    2. **#1 / $140.00** On West Corral Drive, starting at approximately 500' past the hairpin corner at the Gold Rush intersection, reestablish the ditch for about 100' running.
    3. **#1 / $100.00** On West Corral Drive at 1.75 miles from Chesaw Road, pull a short section of ditch.
    4. **#1 / cost included above** On West Corral Drive, 700' past the Big Rock intersection, reestablish a short section of ditch.
    5. **#1 / $250.00** On West Corral Drive, at about 3.35, there's a wide steep corner that drains a lot of road water to a ditch and downstream culvert; reestablish that ditch that has been silted in.
    6. **#1 / $150.00** On Big Rock road at the intersection with Outback, reestablish the very short ditch section immediately in front of the actual giant rock right next to the road, allowing ditch flow to make it to the culvert right there. PLEASE take care not to disturb the expensive surface gravel in front of that residence gate right there, and please take a moment to remove the ground reflectors staked out in the area before you ditch if they're in your way.
2. **#2 / $1515.00** Install (5) loads of pit run on the upper end of Horse Trail Drive.
3. **#2 / $303.00** On West Corral Drive at 1.75 miles from Chesaw Road, install (1) load of pit run down the middle of the road in order to reestablish crown.
4. **#2 / $1308.00** On West Corral at 3.20, starting at the base of the narrow steep incline, install (4) loads of 5/8”-minus.
5. **#3 / $5600.00** On West Corral, at about 3.65 starting just past the white vinyl rail fence right next to the road, there's a steep section full of bedrock right up to the surface of the road; there are no existing ditches, and the road is gullied, acting like a ditch itself. This road needs to be raised and have ditches established:
    1. Install 8”-12” thick of graduating ballast sized rock and cap off with 5/8”-minus.
    2. Install rip rap in ditches.
6. **#3 / $5600.00** On Outback Road, for a 480' stretch of road that is before and after Silver Spur, that section is full of bedrock right up to the surface of the road; there are no existing ditches, and the road is gullied, acting like a ditch itself. This road needs to be raised and have ditches established:
    1. Install 8”-12” thick of graduating ballast sized rock and cap off with 5/8”-minus.
    2. Install rip rap in ditches.
7. **#3/ $400.00** On Big Rock road about 500' uphill from the West Corral intersection, drop a large fir tree leaning out into the road.

Division 8

1. Ditch and grade with a grader:
    1. **#1 / $170.00** The entrance to Big Horn Ridge “paved” road (Canyon View Lane), right before and after the nice wood gate at the entrance. This road is located at .3 miles down Longhorn Rd from the Chesaw road.
2. **#2 / 350.00** At the entrance to Big Horn Ridge “paved” road (Canyon View Lane), where it intersects with Longhorn Rd, there is a channeled erosion spot where the west side of Canyon View dumps its water over the edge onto Longhorn; this spot needs some rip rap installed on that dump embankment. There is an existing pile of excess rip rap just across the road and slightly north; use that. Then use some more of that rip rap to fill a deep erosion ditch at about 85' up Canyon View from the Longhorn intersection, such ditch just upslope of a culvert entrance.
3. **#2 / $1400.00** On Longhorn Rd, at about .3, where a culvert inlet exists on the west side of the road right by a private driveway apron, that hillside feeding the ditch and culvert is a sandy and erosive. Using larger rip rap bolster the culvert inlet area.
4. **#1 / $85.00** Order and install Canyon View road signs (entrance to Big Horn Ridge) and pole at intersection with Longhorn Rd.
5. **#2 / $327.00** Install (1) load of 5/8”-minus on the short steep grade on Longhorn at the 1.5 mark approaching a residence private driveway (terribly boulderheaded road section).
6. **#3 / $654.00** On Gold Rush Ridge road, about .6 miles past the intersection with Lake View Spur and Cougar Drive, there's a steep downslope section of road starting at where a nice green roofed residence with brown siding exists that is a terribly boulderheaded road section:
    1. Install (1) load of 1 1/4”-minus right down the center of the road,
    2. then cap that off with (1) load of 5/8” minus.
7. **#3 / $654.00** On Cougar Drive just prior to the pond there's a stretch of road that needs binding gravel:
    1. Install (1) load of 1 1/4”-minus right down the center of the road,
    2. then cap that off with (1) load of 5/8” minus.
8. **#1 / $375.00** On Gold Rush Ridge road at about .5 miles from the intersection with West Corral there's a wide left turn that has a very silty hillside on the left, and you can see that prior workers have installed a ditch concept that is above-grade. This ditch needs a little repair work with a hoe, as it has become silted in and has a break in the center of it where water is now washing across the road.
9. **#2 / $1054.00** At the very beginning of Gold Rush Ridge where it intersects with West Corral... this road confluence unavoidably creates a challenging watershed maintenance condition where upper West Corral dumps some of its water onto Gold Rush and has eroded the road plane and also deeply eroded the Gold Rush ditch:
    1. deliver (1) load of rip rap to the site, use ½ of it in the deep eroded ditch, and place the other half aside at the obvious wideout flat spot at the road intersection for future use (place this as tightly to the east at possible in the flat spot because the flat spot is used for other maintenance staging purposes and we need too conserve the space available).
    2. Install (2) loads of 5/8” minus in the center of Gold Rush at the beginning, going downslope, to create a good road crown. Maybe one load will be enough... adjust if necessary.

10. Order and install a Canyon View Lane sign at the entrance to Canyon View Lane.

Other Tasks and Costs

1. **#1 / $1000.00** Machine clear (hoe) plugged culvert inlets and outlets (all these are marked at location with a blue flagged wood stake in the ground, and they're marked on a map).
2. **#1 / $2000.00** Fall gravel raking, where necessary to reestablish crowns and eliminate washboard.
3. **#1 / $240.00** "Call For Locate" labor/time costs and mileage charged by contractor (this is having the PUD come out and mark where power lines are in ditches we will dig into).
4. **#1 / $175.00** Purchase 100lbs of highland grass seed for volunteers to plant/spread along roadsides and ditches that would benefit from vegetation erosion control.
5. **#1** 8.1% sales tax on all charges.

Rake Purchase Report

7/6/19

Written and submitted by Kirk Johnson, reviewed by Brett Coffman.

I. Summary and Recommendation

It is recommended that the Nine Mile Ranch Homeowners Association (9MRHOA), as soon as possible, purchase a Poor Boys Grader brand gravel road rake (Rake) for the following reasons and benefits:

1. As shown further below, the HOA owning its own Rake will be a net savings in the overall road maintenance budget.
2. Given the construction and composition of our roads, the Rake has proven to be *by far* the best – and in most circumstances the only – tool to adequately and affordably perform crowning and surface smoothing, including eliminating washboard and rutting; these maintenance tasks are central to controlling road erosion. It can also be used to move snow slush off of roads during spring melt. This tool is used extensively each year as the primary road maintenance tool for 9MRHOA. You can see a YouTube video of the rake at https://www.youtube.com/watch?v=_Y9lGa78D7Y.
3. The Rake has been used to maintain crown and surface smoothing on Ranch roads for approximately 10 years, so its effectiveness and function are well-proven.
4. Tim Roberts, the local contractor who has provided his services and his Rake for our raking needs for those 10 years, does not have a state contractor's license or a state business license, so for insurance and liability considerations the 9MHHOA BOD is advised not to continue to hire him while he remains in that status. He has also declined to either sell or rent his Rake to 9MRHOA. After extensive research it appears that, other than a single other rake that is infrequently available for rental, Tim Roberts is the only work contractor in the region who owns a Rake, so without the ability to hire him 9MRHOA is left with no practical option but to consider purchasing its own rake.
5. The cost to purchase, cost to maintain, and means of storing and using the Rake is on a scale that is feasible for 9MRHOA's budget and operating circumstances:

   (a) $19,000 initial purchase cost (with taxes and accessories); feasible when combining the expenditure ability within current cash flow and savings.

   (b) The Rake is manufactured locally (Okanogan); the manufacturer stocks replacement parts, and provides very affordable service in their shop ($65.00 p/hr) or in the field ($85.00 p/hr).

   (c) The Rake is mechanically simple to maintain and operate, allowing a wide variety of possible contractors and volunteers to be able to use and maintain the tool for 9MRHOA.

   (d) The Rake operates and locates by being towed behind a ¾-ton pick-up truck, which is obviously a commonly-owned item by contractors and volunteers and therefore does not require 9MRHOA to purchase anything but the Rake itself. A truck requires no adaptation or modification to be able to use the Rake, so any existing truck is ready able to haul and operate the rake without adaptation costs.

   (e) The Rake can be located (driven from location to location) simply by being pulled by a pick-up truck, and state RCWs classify the Rake as not needing license and registration to move over roadways = no licensing/registration costs.

(f) The Rake can be stored outside of a shelter, therefore needing only to be parked (stored) on a volunteer's land somewhere; this is a feasible and advantageous scenario for 9MRHOA because 9MRHOA does not own property or currently have the financial capacity to either purchase property or a storage building.

(g) The common potential alternative to using a Rake is using a road grader. According to the manufacturer, Okanogan County representatives, and common available wisdom, the reason the Rake was invented to start with was to perform these tasks at a small fraction of the purchase cost, complication, operation skills needed, maintenance costs, and insurance costs of a road grader. The Okanogan County Public Works Department uses a rake for the same reasons and benefits. Also, many miles of 9MRHOA roads are too narrow for a grader to properly crown, and are composed with boulderhead base rock that causes a grader to make more of a mess of road grading and pulling up road base than actually benefiting road maintenance.

(h) The Rake controls are powered by (2) 12V auto batteries which are rechargeable either by plugging a common charger into a 110V outlet or by a 12V solar panel. Both sources are commonly available, especially by volunteers, and the solar panel option allows the Rake to have its power maintained when being stored in a location that may be away from an available electricity outlet. According to the manufacturer the Rake can perform approximately 30-40 hours of use on one charge, depending on how much the operator uses the controls.

(i) Per the manufacturer's comments, and common observation, most of the maintenance can be performed by any person even reasonably mechanically inclined; this promotes lower overall maintenance costs and greater volunteer participation (which is free of cost).

(j) A common problem 9MRHOA has had is that raking must be performed when adequate moisture is present in the roads; not owning a Rake means waiting for scant others available to supply a Rake and perform the raking for us during the small windows of time when road moisture is adequate, and this is the same time when we would compete for raking with others who also need it performed (earlier this year we experienced this negative consequence when we had to cancel more than half of the raking because we couldn't get it done when road moisture was present because of this availability competition). 9MROA has (36) miles of roads and cannot afford to risk ½ or more of raking each year not getting done, and owning our own Rake would eliminate this problem and even improve on it because we could rake more or less at will.

II. Costs Enumerated *(not inluding sales tax)*

(a) Purchase price $16,900.00

(b) Spare tire and mount $375.00

(c) Replacement tines ..... $25.00 each
Depending on how aggressively the Rake is used, how much boulderhead roads are raked, and how experienced the operator is, it would be prudent to plan on replacing approximately (3) tines per year according to this author for many years watching Tim Roberts operate his rake. Tines can be easily replaced with a large wrench.

(d) Labor cost to replace tines per year ..... est. $120.00
This is based on paying a contractor to do this while he's in the act of raking;
(3) tines replacement labor x .5 hours each x $80.00 per hour.

(e) Batteries replacement every two years ..... est. $300.00

(f) Regular greasing/lubrication per year ..... est. $140.00
This is based on the contractor performing lubrication after each use per year (twice), at $80.00 per hour plus $20.00 for grease.

(g) Major maintenance/repair: every (2) years ..... est. $640.00
This is based on $65.00 per hour shop rate from the manufacturer, replacing $250.00 worth of hydraulic equipment and (6) hours labor.

(h) Major maintenance and repair: every (4) years in addition to (2) year .... est. $390.00
This is to have something welded or otherwise manipulate by a heavy equipment tool shop; (6) hrs. x $65.00 per hour by the manufacturer.

(i) Insurance per year $112.00
According to recent quote from 9MRHOA insurance provider, this is the current cost to insure the rake itself and to provide non-owned auto coverage to protect all drivers who operate the rake.

III. Per Year Costs, and Compared To Prior Raking Costs

All costs based on current prices and do not include allowing for inflation.

(a) Initial purchase cost of Rake, amortized over (25) years $680.00
This assumes that 9MRHOA will be able to maintain a Rake in functional condition for 25 years. Given that all the moving parts and other maintenance/replacement costs are calculated into subsection III(b) below, that leaves only the basic frame and suspension of the Rake to account for, so it is reasonable to say those items should last for (25) years, especially given the relatively infrequent use of the tool compared to other trailered auto mechanisms.

(b) Per year maintenance costs (per ss. II(c) - (i) above) $1014.50

(c) The total per year costs for (a) and (b) above amount to $1694.50. Let's compare that to prior 9MRHOA raking costs, as were performed by a contractor. The raking charge for fiscal year 2018/2019 was approximately $3700.00, and that represented a realistic and conservative amount of needed raking; in other words, additional raking was not performed for the sole purpose of just making roads nicer to drive on. The $3700.00 contractor charge was based on a charge rate of $100.00 per hour. We can project that a contractor would charge potentially $50.00 per hour to rake for us if we provide the rake, so that would be half the prior charge. Adding all things together: $1850.00 contractor charge to rake if we provide the Rake plus $1694.50 per year for Rake costs = $3544.50 per year if we owned the rake compared to last year's charge of $3700.00. This does not account for other factors that might lower costs even further, like:

(I) lowered costs if a volunteer performs raking and other maintenance,

(ii) if more raking is performed beyond the 2018/2019 model then the per-year 'purchase and maintenance' costs are spread out over more mileage usage, thereby providing more raking to us at lower per-mile costs.

IV. Comparing Poor Boys Grader Rake to Other Rakes

The Poor Boys Grader Rake (PBR) is a patented tool, and according to reasonable internet searching there is no other comparative rake available like it, the Poor Boys having been designed specifically for

raking gravel roads while all others are either for soil/landscaping use or are very small-scale homeowner use. All others are significantly smaller in duty capacity and are much more limited in control aspects that are critical to gravel road maintenance. The closest comparative model found was a rake manufactured by Troy, a very long-standing American company who has a dealer in Okanogan. Here are some major comparisons:

1. You can see a video of the Troy rake at this link: http://assuredcomputer.com/kirk/yorkrakehr09.wmv.
2. You can see a picture of the tow-behind York model at this link: http://assuredcomputer.com/kirk/yorkrakepic.jpg.
3. The PBR costs $16,900 new while the Troy costs approximately $9000.00.
4. The PBR weighs approximately 2000 lbs while the Troy weighs approximately half that. This affects how deep one can rake into gravel; the PBR is specifically designed to dig significantly into gravel depth while the Troy rake is less able. This means less effectiveness and greater per-hour operation cost for the Troy in order to achieve the same result as the PBR.
5. The PRB has rake tines, power controlled by the person in the truck cab, that can tilt in three different axis directions and can be adjusted while the rake is rolling down the road. Again, the unit having been specifically designed for raking roads, this allows raking to be feathered lighter or deeper and at differing angles while in motion which are critical features to creating road crowning and smooth road surfacing as well as being able to raise and lower the rake over boulderheads so that fewer tines are broken. This also allows adjustments to be made without stopping raking; all of this emulates what a road grader can do. The Troy rake is not able to tilt at angles that install road crowning; road crowning sheds water and is critical to road maintenance. The Troy rake's adjustments must be made manually, while the vehicle is stopped; in other words, the operator must stop, get out of the vehicle, change adjustments on the rake by hand, and then resume raking... this lowers the effectiveness of smooth grading, increases operation time, will likely increase tines breakage, and will certainly deter some amount of both contractors and volunteers from performing raking because of such a laborious process.
6. The PBR has a tines rack that is 12' 6” wide, designed to be able to be wide enough to reach into ditches and off road edges to grab excess gravel and bring it back onto the road planes. The Troy rake is 10' wide, not wide enough to perform this feature effectively. In a recent conversation with prior raking contractor Tim Roberts, he stated that this is the reason that after a couple of years of owning a 10' wide PBR he upgraded to their 12' 6” model, and this was his main reason for suggesting a person get a rake that is no narrower than 12' wide.

Pictures of Special Assessment Gravel Placements!

October 15, 2019

On August 31, 2019 our HOA membership approved a special assessment to purchase $54,000 worth of road gravel and for $19,000 dedicated to purchasing a gravel rake. As payments started coming in in late September the Road Committee ordered initial placements of gravel to begin, placing the amount of gravel worth equal to the money collected. Initial placements are complete for now, allowing winter to set in and for additional funds to build up until next spring when placements will continue again. (28) truck loads of quality topcoat gravel, worth $9400.00 with sales tax, have been placed, representing approximately 1/6 of the total special assessment funds for gravel. Funds continue to come in and we're also setting enough aside to stay on schedule for the rake purchase in spring.

Click on to the pictures below to see each and every placement made so far, spread throughout most of the Ranch. Gravel placement priorities have and will continue to be on steeper inclines, to cover exposed boulderheads in the roads, and high traffic areas. We won't be able to do all we'd like to do but this will be a big step in improving our roads and making up for the lack of gravel placements over the last 20 years.

- (6) loads on the first .2 miles of Pine Bluff (Division 4)
- same as above
- (2) loads at the beginning of West Corral (Division 7)
- (1) load on upper West Corral just past Porky Pine Spur (Division 7)
- (4) loads on upper West Corral on steep bouldery road section at about 3.15 miles (Division 7)
- (1) load on upper West Corral on steep erosive corner turn at about 3.4 miles (Division 7)
- (2) loads at the beginning of Wagon Wheel (Division 3)
- (4) loads at the beginning of Point Drive, south end (Division 4)
- (1) load on Mallard Drive starting at the cattle grate (Division 5)
- (1) load on Mallard Drive at about 1.35 miles down Mallard Drive (Division 5)
- (1) load on Corral Drive at about .15 miles (Division 6)
- (1) load on Corral Drive at about .5 miles (Division 6)
- (2) loads on Longhorn Road at about .35 miles (Division 8)
- (2) loads lower West Corral at about .7 miles (Division 7)

Road Maintenance Update

July 9, 2022

Recent Heavy Rains

On the July 4th holiday weekend there were heavy cloudburst rains in the region that created a lot of erosion washouts on the surfaces and edges of many Ranch roads. Members of the Road Committee inspected all Ranch roads for any emergency repair (impassability, excess driving danger) and found no need to immediately dispatch contractors to repair. All damage was taken notice of and will be repaired along with all other regular fall maintenance, except that a couple significant roadside embankment erosion control repairs involving rip-rap rock placement will be accomplished next week along with the repairs in the second bullet below.

Other Currently Scheduled or Completed Road Work

- At the most recent Board meeting the Board approved expenditures for the Road Committee to execute the list of prioritized repairs as indicated in the June 21, 2022 Road report. The repair items in the Report that were approved were all yellow and red highlighted items, as well as Division 5, Item #2 on page 4 in the Report. During the actual performance of the work there may be slight adjustments to specifically accurately deal with the items.
- Most truck loads of rip-rap erosion control rock have already been dumped in strategic locations where needed (per items in the Report). Beginning the week of July 11 all repair items related to the rip-rap placement will start to be performed, along with other repair items that might be near the rip-rap locations and involving the same type of machinery.
- The overall 2022-2023 HOA budget is scheduled for (61) loads of replenishment and other gravel to be placed around the Ranch; the Report itemizes (57) of them. As of July 8, 2022 we have marked for (26) loads to be placed, in Divisions 5,3,7 and 8 so far. So if you see pairs of stakes – one with a green flag and the other with red – there will be replenishment gravel spread between that pair of markers and another pair some hundreds of feet further down the road. Gravel placement is scheduled to start during the week of July 11.
- The first seasonal major road weed control spraying was completed in late June. The second spray – a touch-up spray for missed and newly emerging weeds – was ordered on July 4, 2022 and is expected to be completed in the next week or so. This second spraying will especially target the later emerging Russian thistle (looks like tumbleweed) on many roads, which emerged later than normal this year.
- A land owner has once again volunteered to accomplish the duty of trimming many trees that encroach Ranch roads in spots... some trees have already been trimmed and more will be through to fall. We are so very appreciative of his volunteer efforts!
- A group of land owners have volunteered to replace a burned out gate post and rehang the gate at the entrance to Division 3 at Wagon Wheel road... this is another volunteer effort we are also thankful for!