

Additional Sheet
2024 Annual Report
Coal Creek Resources
M-1988-044
Schmidt Construction Company
Anniversary Date: March 28

OVERALL STATUS: The entire operation has now been placed under full reclamation. No further mining will occur under this permit. The final result fit the terms of the permit as well as the lease requirements. However, the revegetation portion of the operation has yet to be completed. The new aerial images included in this report show what the reclamation areas looked like on about June 1, 2023. As explained below, on that date the site had already been severely affected by the first month of record breaking and extraordinarily severe rains. Those rains continued into early July with frequent severe thunderstorms that produced, in total, about 10 to 12 inches of rain in the course of two months.

SITE CONDITION: The site was inspected on March 20 to see what the condition of the land was at the end a very normal 2023-2024 winter. The pit area was in good condition and most of the *Kochia* tumbleweeds were lying on the ground. Not sure why that was the case because at the plant site that was not the case. It looked like the tops of the *Kochia* at the pit had been broken off. Perhaps the few horses that are often seen on this part of the Lowry Ranch ate them. But the abundant rest of the weeds were acting slightly like a mulch in some areas and appeared to be decaying. Over many areas very few grass plants were found but on the north end of the pit several species of grass, most from seeding, were present, mainly on the lower portions of the pit slopes. This will be explained later in this discussion.

At the plant site more grass was found in many areas including plants that were probably planted and were sending up some very early leaves. But most of the grass was Witch Grass, a native pioneer species that invades sandy soils. It's density was high on the long slope leading down to the access road. It was obviously controlling erosion where it was growing. The upper portions of the plant site had sparse grass and few weeds present.

Basically, both areas were generally similar to the way they were in September of last year when an extensive soil sampling was done to determine the chemistry of these soils. Included in this annual report is the report of the results of the soil testing and a discussion of how those results are related to the general lack of revegetation species being successful. That lack of success was due, in part, to an adverse soil condition in some areas that were topsoiled with the lower portions of the soil stockpile which was nearly 20 feet deep and

gathered over the last couple of decades as the operation progressed. But most of the lack of success can be attributed to the unusual weather of the early portions of the 2023 growing season. This factor also explains why the tumbleweeds, mainly *Kochia*, were so incredibly large, abundant and dense in some places.

Starting on May 10, 2023 the weather turned from a normal Spring to something that might be considered normal on the Coast Ranges of the area from Big Sur in northern California to Puget Sound in Washington. In short - it was incredibly wet. Between May 10 and July 10 so much rain fell that by mid July the Denver area had received its full normal precipitation amount for an entire normal year. The last time this kind of weather occurred was in the summer of 1967, so it is a very rare condition. The important point is that most of the rain came in huge, violent, flooding storms rather than slow and gentle rain that falls on the northern parts of the Pacific Coast of the United States.

On this site the rain washed much of the newly spread soil off of the upper portions of the slopes and deposited much of it on the lower slopes. Much of the grass seed was also carried down the slope and likely buried too deep in very wet soils to produce much germination, but more than could occur on the upper slopes where the soil and seed was originally located. This, combined with the fact that most of the species in the seed mixture do not grow well in such wet conditions resulted in wide spread seeding failure on both the pit and the plant areas. Basically what the revegetation was planned for did not occur and what did occur was inappropriate for what was planned. The seed mixture is for a semi-arid land which is what normally occurs; what happened was more like a sub-tropical site with an intense wet season followed by a dry season. This abundant moisture primarily helped the weeds to grow whose seeds germinate earlier than the primarily warm season grasses in the planted seed mixture. So, by the time those grasses could germinate the weeds had already taken over the site. But this could only occur where the soil, including the seeds, was still more or less present on the slopes. A near perfect setup for a revegetation failure of great proportions. And this was true of both the reclamation of the pit area and the plant area.

But approximately one-fourth of the pit area has a very serious additional problem. By the effective end of the 2023 growing season these soils had formed a thick and hard crust that few plant seedlings could ever penetrate. But these areas were dominated by dense forests of *Kochia* that had developed during the wet period when the crust forming soil was moist due to all the rain. But later when it dried out the soil formed a “concrete” like crust over an inch thick. As the soil study shows, in growth tests very few of the seeds planted in that soil could even germinate much less grow. But in a good growth medium the seed mix produces a dense and vigorous growth with a very high germination rate. In most of the topsoil spread on these sites this seed mixture which has been very successful on the many other acres reclaimed at this operation should have grown quite well, except perhaps on this one soil during this highly unusual year.

All the topsoil that was stockpiled was taken by salvaging the soils from new areas to be mined. That soil, although a bit sandy as expected is on this area, produces an excellent grassland vegetation and on reclaimed areas the replaced soils do the same and often very quickly. But with this soil something horrible happened to it. The soil color is very dark rather than the light brown to tan of the native soils and thus contains what appears to be a very high organic matter content. But the pH of this soil is at least ten times more alkaline than any of the other replaced soils or the native soil from which it was derived. Furthermore the chemistry of this soil is unlike any of the other soils replaced on the site. Please review the soil study report for details.

A literature review on the occurrence of this kind of massive soil change as a result of stockpiling found several peer reviewed papers from various studies around the world where something similar happened in other mine reclamation projects in a wide variety of environmental conditions. But it is a rare phenomenon.

What sometimes happens in old and deep stockpiles is that the soil becomes anoxic which allows anaerobic bacteria and cyanobacteria as well as various fungi to inhabit the soil. This alters the structure and chemistry of the soil so it becomes either very acid or very alkaline but also it can contain various compounds that can be toxic to aerobic organisms if the soil is excavated and spread on the surface. As the areas where the deeper portions of the stockpile were used to spread on the surface are now the problem soil areas in the pit.

Interestingly, the soils spread at the plant site were also from an old and deep stockpile that had the potential to produce a similar problem but it never occurred there which aligns with previous experience with deep soil stockpiles back in the history of this operation. Thus the problem is only associated with the big stockpile at the pit site. Other shallower topsoils that were used to form a berm around the pit did not develop this problem and remained similar to the original soils from which all stockpiled soil was derived from. This, in turn, creates a mystery of only one topsoil stockpile exhibiting this rare phenomenon. The answer is unknown and is likely never even decipherable. But, as all the soils and deeper materials that were mined for sand came from tens or even hundreds of outwash plains produced during the Pleistocene from the erosion of lands on the Palmer Divide to the south it is logical to assume that each layer was slightly different due to changing conditions during the Pleistocene and the post glacial periods. Plus those materials were also affected by wind blown mineral material deposited during strong wind periods and perhaps droughts or muds left from floodplains elsewhere. So, when all those layers are mixed and stockpiled it is entirely reasonable to assume that some blends could potentially develop a suitable environment to produce anoxic conditions deep in the stockpile.

The studies recommended that stockpiles be no deeper than about 2 meters (about 6 feet) and that they be used as soon as possible rather than sit for years. Also they should be planted with very deeply rooted

plants that have a chance to keep the deeper portions oxygenated to some extent. This degradation is apparently a rare condition that currently is unpredictable as to whether it will develop. And it is best to not stockpile at all but rather design the operational plan where possible so topsoiling is done by hauling salvaged soil to a prepared site and spread immediately. (Note: Copies of these studies are available from Mark Heifner on request.)

At this point, the site has been severely damaged by winds, rains, and erosion during the vicious thunderstorms of 2023 between May 10 and July 10. The revegetation plan, at least in some areas if not most, is no longer appropriate for the resulting conditions. So future planting will need to use a different seed mixture that is more appropriate for the conditions present now. One element of that new seeding needs to be the use of a sterile cover crop planted in the Fall so hopefully it can beat the weeds at the start of a growing season the next Spring. Triticale is an excellent seed to use on the areas more prone to producing strong weed growth. It grows similar to winter wheat in that it comes up very early and grows vigorously thus beating the weeds to the nutrients while allowing other grasses planted along with the Triticale to become established. So, although extensive regrading is not needed a completely new seed mixture needs to be developed for planting later in 2024.

However not everything was a failure. In the pit area there are areas where Scotch Thistle has become established. These will need to be killed off as best as possible prior to replanting later this year.

However, the five year time limit on reclamation has been reached so an extension will be requested in the near future. The reclamation has been slow to occur because of a lack of peoplepower during the Covid pandemic and the fact that any crews that could be created were also reclaiming another Schmidt operation at the same time this one was being done. Not enough equipment or people to do two projects at the same time as the employees that did the reclamation had to be taken off of road construction crews for that other portion of Schmidt's business structure. And the other site, the Miller Pit in Elbert County, is also going to require an extension along with this operation.

So that is where it all stands at this time. A huge and very expensive setback, but every problem has a solution and full reclamation will be achieved after implementing a new revegetation plan more appropriate for the site as it is now.