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Soil Nutrient Deductions

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Introduction: What Are Soil Nutrients?

Soil is the major source of the nutrients essential for plants. Nutrients are chemical compounds that provide nourishment for the growth and maintenance of all life forms. In particular, nutrients needed for plant growth are derived from soil. Of the 17 essential nutrients for the growth of most plants, the most well-known soil nutrients are nitrogen (N), phosphorus (P) and potassium

(K). They make up the trio known as “NPK.” When one of these essential plant nutrients is deficient, then plant growth will be reduced, even if all other essential nutrients are adequately supplied. Thus, maximum yield potential can only be achieved when the proper balance of nutrients is in place.

The objective of this article is to briefly review at a high level the planning opportunities afforded by various provisions of the Internal Revenue Code (“IRC” or “Code”) that authorize federal tax “legacy nutrient deductions” (“LNDs”) for properly valued and documented soil nutrients. This article is also intended to provide real estate and tax professionals with tools to successfully obtain LNDs in a fashion that should withstand any challenge by the Internal Revenue Service (“IRS”). All Section references herein refer to sections of the Code.

Overview: Legacy Nutrient Deductions, Benefits, and Policy

Legacy nutrient deductions have existed as part of federal tax policy since the adoption of IRC Section 180 in 1960. Section 180 provides a current deduction for the soil nutrient value (residual fertility) in land (a) purchased or inherited in the year that the deduction is pursued, (b) that is used for agricultural production, and (c) where the owner is actively engaged in farming, ranching, or in some cases, production timber. The term “production timber” means timber that would qualify for Section 180 treatment — and not all timberland does.

Other provisions of the Code (Sections 167, 168, and 611) also offer taxpayers the opportunity to utilize LNDs. These approaches are similar to the depreciation or amortization of long-term assets, which include soil nutrients, or the depletion of mineral interests and the depreciation of mines, oil and gas wells, and other natural deposits. While implementing LNDs under these Sections does not allow for a one-time, current deduction as does Section 180, they do offer strategies to landowners who are not actively engaged in the business of farming. They also offer landowners the possibility of pursuing LNDs on previously purchased or inherited properties. While Section 180 is the most powerful tax strategy for landowners due to the up front nature of its tax benefits, these other three Code Sections may fit an even larger number of taxpayers.

Farmers and ranchers who currently own or who are contemplating acquiring land can significantly benefit from an LND strategy. However, though long present in the IRC, LNDs have not been widely understood or used. If a rural landowner qualifies, the tax savings resulting from the use of LNDs not only return cash to a landowner’s pocket, but it also can provide additional working capital, extra resources to buy more land, capital to replace worn-out equipment, and improve infrastructure for farm/ranch lands.

The successful implementation of a soil nutrient deduction strategy starts with understanding the concepts present in the relevant Code Sections and Treasury Regulations and thereafter following the parameters, requirements, and valuation methods discussed below.

Evolution of Deductions and Guidance

While the enactment of Section 180 kick-started the use of LNDs across all four code sections, the IRS didn't publish material guidance on how to safely pursue LNDs until July 1995 (MSSP 3149-122, TPDS No. 83960J) (the "1995 MSSP"). The goal of the 1995 MSSP program, together with subsequent similar announcements, was to eliminate potential taxpayer errors arising from either the lack of guidance from the IRS on how to obtain LNDs or the overaggressive or fraudulent approaches that some taxpayers were pursuing. These taxpayer errors, whether intentional or accidental, generally involved landowners — including farmers, ranchers, or timberland owners, taking the deduction on nonqualifying property (i.e., not agricultural land), taking too big of a deduction (potentially including naturally occurring nutrients or nutrients that are not used in agricultural production), or taking the deduction too quickly (e.g., using the immediate Section 180 deduction when not appropriate or using too short of an amortization period under Sections 167, 168, or 611).

Using the best agronomic and technological understanding at the time, the 1995 MSSP guidelines laid out the following additional criteria to accomplish these goals: (a) establish the presence and extent of the fertilizer (the natural and man-made source of nutrients); (b) show the level of soil fertility attributable to fertilizer applied by the previous owner; (c) provide a basis upon which to measure the increase in fertility in the land; (d) provide evidence indicating the period over which the fertility attributable to the residual fertilizer will be exhausted; and (e) prove that the landowner has beneficial ownership of the residual fertilizer supply.

While the 1995 guidance attempted to provide taxpayers with the parameters on how to successfully obtain LNDs, it left a material amount of ambiguity on how to specifically adhere to its principles. Accordingly, landowners were often left to rely on the filing procedures advised by their individual CPAs. A previously issued Technical Advice Memorandum (TAM 921107, December 3, 1991) from the IRS shed no material additional light on how best to obtain LNDs.

Thirty-plus years have come and gone without any updates or clarifications to the 1995 MSSP as it relates to LNDs. The past three decades have seen tremendous technological advancements, as well as major strides in relevant scientific fields such as forensic agronomy. While these advancements could not have been contemplated in 1995, they have allowed tax practitioners, tax attorneys, and auditors to more easily and defensibly pursue and evaluate LNDs while adhering to the spirit of the 1995 MSSP.

Overview of Taxpayer Errors: When Are LND Errors Most Likely to Occur?

Most taxpayer errors in attempting to obtain LNDs occur when landowners try to pursue these deductions on non-agricultural land, when they try to take the deduction too quickly, or when they try to take too large of a deduction. While meeting the agricultural land requirement is a

black-and-white determination (farmland, ranchland, and production timberland are eligible, while gravel pits are not), ensuring that landowners use the deduction at and over the right period of time and in the right amounts requires a deeper understanding of soil science.

Deductions Must be Taken At the Appropriate Time (Not Too Quickly)

Because soil nutrients in the “aerobic zone” of the topsoil (roughly the first 6 to 8 inches) are readily plant-available, they are used in a relatively short time frame. This is a critical factor when thinking about amortization periods of LNDs under Sections 167, 168, or 611 (e.g., farmland, ranchland, and production timberland). For qualifying landowners, Section 180 allows them to take 100% of the deduction in the year of filing. The other sections, however, are silent on the required amortization period.

There are certain nutrients that have atypical behaviors that must be noted. Nitrogen, for example, cycles quickly in soils for a multitude of reasons. In fact, it moves so quickly and opaquely that it usually provides little in value to LNDs. Calcium is another crop-necessary nutrient that has a slightly more complicated relationship with crop production because it serves several purposes in soil. Iron is the last of the three agriculturally necessary nutrients that has a complicated relationship with crop production due to the fact that it is used much more slowly than all of the other crop-necessary nutrients.

The refined understanding of how these nutrients are used in soils has allowed agronomists to successfully model usage and depletion rates by crop type. The tax law does not require a CPA or landowner to amortize the deduction on a nutrient-by-nutrient basis. In fact, many tax preparers argue that LNDs should be amortized under accelerated depreciation principles. However, the Code is silent as to the preferred approach and specific time frames of such amortization and across different land uses, including cropland, rangeland, and production timberland.

Because of this, many CPAs choose to let the calculated usage rates of these nutrients inform their choice in selecting amortization periods. Because of the robust analysis of soil scientists and agricultural extension universities regarding the usage rate of these nutrients, the market has developed a rule of thumb of amortization periods for LNDs. Since most nutrients in the aerobic zone cycle in a three- to seven-year period, most CPAs choose amortization periods ranging from three to seven years when utilizing Sections 167, 168, or 611.

Deductions Must Be Taken in Appropriate Amounts (Not Too Much)

Once a landowner has established the volume of soil nutrients present at the time of acquisition or inheritance, he or she must then draw a distinction between the “baseline” nutrient levels and “excess” nutrients present in the soil at that time to appropriately value and prepare his or her LNDs.

Most state agricultural extension agencies regard the best practice for determining “baseline” nutrients as applying one year’s worth of crop use to the soil. For example, if a farmer were attempting to produce 220 bushels of corn, best practice with regard to fertilizer would involve applying enough nutrients to produce 220 bushels (commonly referred to as “baseline nutrients”). Any nutrients that are applied in excess of the crop-usage amount are commonly referred to as “excess nutrients.” Anything present in the topsoil of the aerobic zone that exceeds that baseline amount at the time the land is purchased or inherited is deemed an “excess” nutrient, the amount that supports the LNDs (subject to basis limitations).

This approach provides a conservative approach — if a landowner were producing a less-nutrient-intensive crop, the deduction would be less than what they could have otherwise argued — to ensure the greatest amount of nutrients are described as “baseline,” thus reducing the amount of nutrients that could be deemed as “excess.” This method for determining “excess” is far superior to the previously used “comparables” approach, pursuant to which “excess” was determined by comparing one landowner’s nutrient levels to a set of regionally comparable properties. Use of this prior method resulted in issues that invited IRS scrutiny.

As with other forms of depreciation, LNDs reduce the basis that a landowner has in its property. Accordingly, the landowner would face depreciation recapture for the full amount of the deduction at the time of sale. The landowner is not avoiding taxes by pursuing LNDs. Rather, he or she is simply postponing payment of certain taxes until a future date when property is sold, unless they pass away without ever selling the property and their beneficiaries receive a step-up in basis. This provides an additional “fail-safe” for tax-revenue collection, making the concerns about the scale of an LND more of a timing issue than an amount dispute.

Forensic Agronomy: Decreasing the Landowner’s Risk

Agronomy is the general study or science of crop production, which includes a large number of subtopics, such as genetics, fertility, soil, chemicals, range, and grassland management, as well as production practices and procedures. It is widely used in agriculture to help farm/ranchland/production-timber owners understand the relationship between their practices and their expected agricultural outcomes.

Forensic agronomy, on the other hand, is the study of these practices to identify and understand what these things looked like in the past. Forensic agronomists examine data (including current and historical soil, crop, and grazing records) to reconstruct past soil conditions and to identify key moments that led to adverse events, among other historical occurrences. In doing so,

forensic agronomists have honed a unique skill set, often serving as expert witnesses in litigation, insurance, and tax matters.

Today, the ability of forensic agronomists to determine what soil nutrient levels were at a prior date (based on current soil information, crop yields and grazing records, and fertilizer- and manure-application records) far exceeds any capabilities contemplated by the 1995 MSSP.

How a Forensic Agronomist Makes an Effective Assessment

In the case of LNDs, forensic agronomists start with assessing the current levels of agriculturally necessary nutrients (such as phosphorus, potassium, manganese, boron, and others) in the soil. Next, they add back the amount of nutrients that it took to produce the crops that were harvested. Then, they subtract the amount of fertilizer and manure that had been applied. The resulting nutrient balance reflects what existed in the soil prior to that year's fertilizer and crop-production activity.

By evaluating fertilizer application, crop production, stocking rate, and stocking density for each of the intervening years between when the baseline soil tests are taken (which establish current nutrient levels), the farm, ranch, or timberland owners and their advisors can accurately, scientifically, and defensibly hindcast the level of agriculturally necessary nutrients present in land purchased or inherited in prior years. With these forensic practices, the accuracy has been enhanced when comparing historic nutrient levels that are forensically determined and the levels determined by a soil test conducted on the date of acquisition, thus understanding the volume of agriculturally necessary nutrients that were present at that time.

Best Practices for the Expert Agronomist

Forensic agronomy studies and results are only as good as the inputs to the algorithms (i.e*.,* garbage in = garbage out). Accordingly, ensuring that appropriate kinds of data are collected is of paramount importance to the forensic evaluation of LNDs. While records of fertilizer application/crop yields or stocking rates and stocking densities are provided by the landowner, the initial soil tests must be collected by the LND service provider to provide consistency essential for this approach.

The 1995 MSSP, however, is silent on forensic agronomy and consequently offers no direction on the types and amounts of data that should be collected. For example, what type of test should be used? How many tests should be taken? At what depth should soil nutrients be measured? Fortunately, agronomy has answered those questions.

Proper Soil-Testing Depth

The best practices involve soil sampling at a depth of 6 to 8 inches (sometimes even pegged at 6.75″). The following summarizes why that is important:

- The top-soil layer, often called the “aerobic zone,” is a natural layer that covers much of our planet’s land surface.
- The depth from the surface of the ground down to 6-8 inches is generally considered the zone of soil that allows for enough oxygen to penetrate the soil, thus supporting microbial life.
- Microbes are needed to break down inorganic fertilizers and convert them into a usable food source for plants to uptake the nutrients and convert them into viable plant nutrients.
- Ninety-eight percent or more of all plant nutrients are consumed by plants in this upper zone.
- Samples taken below 6 to 8 inches will show larger amounts of nutrients compared to tests taken at or shallower than 6 to 8 inches. Here is why:

1. Soils naturally contain nutrients necessary for agriculture production. Measuring more soil will naturally lead to larger gross volumes of nutrients than measuring smaller volumes of soil, many of which are not readily used or impacted by agricultural practices.
2. Weather conditions or tillage/farming practices cause fertilizers that are not used by the plant to leach deeper into soil structures and below the aerobic zone.
3. Oxygen penetration in soil is governed by a variety of factors, e.g., soil structure/texture, moisture content, organic matter, and microbial activity. Soil bacterial activity is generally governed by soil oxygen levels, so the bulk of the microbial activity tends to be concentrated in this higher oxygenated zone.
4. Collecting soil samples at a depth of 6 to 8 inches ensures that LNDs only measure agriculturally necessary nutrients that are both derived from human-driven agricultural practices and which prevent landowners from inappropriately benefitting from excessive nutrient levels that are naturally occurring and/or not used in agricultural production at deeper depths in their soil.

Proper Soil Sampling Type

Grid samples or soil-zone sampling are the most common techniques with which agronomists organize individual soil tests to get an accurate perspective of nutrient makeup and distribution across agricultural acres. However, the size of the grid can vary depending on the specific information that the landowner, agronomist —or in this case, tax advisor — is trying to measure. The best practice includes using a grid or soil-zone sampling protocol with 2- to 10-acre grids for farmland and a potentially larger grid size for grazing acres. Here is why:

- If the land is being used for high-margin crops such as fruits or vegetables that require precision fertilizer, tillage, and seeding regimes, grids less than 1 acre may be relevant.

- General row crops typically receive soil tests taken on a 2.5-acre to 10-acre grid, with the variance arising from the particular landowner/tenant's management practices related to fertilizer application, tillage, and seeding protocols.
- Pasture and rangeland soils are typically managed in a broader-stroke approach due to the practicalities of the amount of acreage involved, as well as the generally lower-margin cost structure of livestock compared to crop production. Grid sizes from 10- to 50+ acres are common.
- Data collection methodologies that balance accuracy and cost while adhering to customary practices are crucial to foster better agronomic practices and the preservation of American topsoil and forest soils. Grid sizes that are too large decrease costs but also decrease accuracy. Ten-acre grids for farmland and 10- to 40-acre grids on grazing acres balance these factors and sit within the realm of customary practices.

Using Forensic Agronomy to Better Support the Use of LNDs

In 1995, the IRS believed the best way to prevent landowners from deducting previously expensed nutrients was to require documentation that a prior owner had applied those nutrients. Even then, however, this approach was often impractical. Consider a scenario where a landowner had leased his or her property to multiple tenants for many years before selling the land. How could the new owner retrieve such application records from each of those prior tenants or from the previous landowner directly?

Today, advancements in agronomic sciences have dramatically improved the ability of forensic agronomists to bring clarity to this issue and further prevent inaccurate claims for nutrient values. The methods developed are scientific and much easier to defend and audit.

Between the 1950s and today, the widespread adoption of soil testing has allowed agronomists to better understand how fertilizer application and crop production affect nutrient addition and removal. Improved knowledge of nutrient cycling also clarified the ways different nutrients interact to influence plant availability and performance, leading to substantial increases in agricultural productivity. For example, average corn yields nationally rose from around 40 bushels per acre in 1950 to 177 bushels per acre by 2025.

Multiple factors influence actual crop yields. Weather and climate variations, pest pressures, and myriad other factors can all impact actual yields. For example, a farmer may plant corn with the expectation of raising 220 bushels. To produce 220 bushels of corn, his agronomist recommends application of a specific volume of certain types of fertilizers. The application of the prescribed inputs will supply the amount of nutrients required to produce 220 bushels. However, the farmer doesn't know how many bushels he will actually produce when he applies his fertilizer for the year, as atmospheric and other weather conditions have an impact upon the crop. Additionally, there are insects, fungi, and many other biological impacts upon crops. All these factors impact the actual number of bushels the farmer will produce.

If these factors cause the farmer to only produce 180 bushels of corn in that year, the farmer will have “left” approximately 40 bushels worth of nutrients in the soil. If the farmer produces 220 bushels of corn, there would be no impact on nutrient levels in the farmer’s soil since his actual yield equals his forecasted nutrient application. If the farmer produces 260 bushels of corn, there would be a net drawdown of 40 bushels worth of nutrients in the soil.

Best Practices to Consider

- Only use LNDs for farm/ranch/production timberland.
- Only use qualified service providers: agronomy experts with a record of experience and with a résumé of successful defense of the methodologies in accordance with the 1995 MSSP guidelines.
- Consult with CPAs and other tax professionals on the best of the four Code Sections for the landowner’s particular situation and the best way to file for the deductions, whether for the current tax year or for past tax years.
- Consult with an experienced attorney to determine whether the resulting losses from an LND are “passive” or “active” based on the landowner’s activity.
- Landowners should obtain an expert valuation/appraisal advisor and conduct soil tests as close to the time of the land acquisition as possible. However, service providers with appropriate forensic agronomy expertise can enable landowners to pursue LNDs many years after purchase/inheritance.
- Determine, if possible, the fertilizer (what kind and how much) applied by the previous landowner.

Other Issues to Consider in Developing a Nutrient Deduction Strategy

Careful analysis as to what is best strategically for each landowner is necessary. The quantity and fertility of the nutrients is what determines the value of the deduction. The higher the fertility, the greater the deduction. On the face of Section 180, it would appear that a taxpayer can deduct 100% of the value of the excess nutrients, subject to basis limitations. Often, tax professionals will recommend that a taxpayer take a deduction for less than 100% of the value of the excess nutrients, even though such value may have been accurately determined and correctly reported by the most expert advisors. Many advisors recommend an aggregate deduction not exceeding 50% to 75% of the purchase price of the applicable farmland or ranchland.

To ensure compliance with IRS guidelines and to maximize the benefit of soil nutrient deductions, landowners should seek counsel from reputable and experienced third-party advisors for data collection, appraisal, and preparation of supporting data for any valuation. It is recommended that landowners avoid advisors who want to be compensated based on

percentage-based charges (“success fees”) but instead look for advisors charging a per-acre fee for the analysis. The resulting per-acre-fee appraisals and reports, on a comparative basis, start with a presumption of independence and greater reliability than reports produced by those charging success fees.

Policy and Strategic Considerations

A major challenge facing the farm/ranch owner is the disparity between the value attached by passive investors to farm/ranchland and the values that farmers and ranchers attach to the land. Farmers and ranchers consider tangible and intangible factors such as productivity, anticipated revenues, government support programs, financing costs, and related factors. Food producers view their farm or ranch as comprising a large part of who they are, what values they hold, how they raise their children, and what legacies they will leave. It is part of their family or community ethos, the basis of the trust shared among like-minded participants in the food chain, and what ties them to generations of those who have shared or will share their unique life experiences.

Thus, the challenge is ever-growing: How can rural America hang on to crop- and forage-producing lands that are increasingly appealing to nonfarming, nonranching investors? This appeal is due to the attraction of consistent investment returns on rural land over long periods of time, the declining worldwide supply of arable land, and the relative advantage of U.S. agriculture (due to our technology advantages, logistics infrastructure, the relative size of natural and international markets, and political stability compared to other countries).

The long-term investment advantage of investments in farm/ranchland is in large part due to the low correlation between returns on and the value of such land in the hands of investors and the investment return on and values of equities offered by the stock market. The low correlation is that the returns and values of each (rural land and public equities) seldom move in the same direction. Farm/ranchland is, to the passive investor, an “inflationary hedge.” Inflationary increases in the prices of commodities boost acreage values and crop income. But that same inflation drives up the price of fuel, equipment, labor, and other expenses faced by a food producer, expenses that are not always of concern to the passive investor.

Consider this case study of how the use of an LND strategy may level the playing field. Assume a farmer wants to purchase 1,500 acres of land at a price of $5,000 per acre. The total acquisition price would be $7,500,000. Assume the farmer utilizes a soil nutrition deduction of $1,500 per acre (nutrient valuation that is often recognized by one of the larger nutrient agronomy and analysis firms.) If that farmer is in the 35% tax bracket for the current year, the deduction could be worth $525 or more per acre (after tax) or a cash equivalent of approximately $800,000. This dollar amount is approximately 12% what he paid for the land. This advantage could be the edge farm/ranch landowners need to retain desirable rural lands in the hands of food producers.

If a policy were adopted nationally that expands the use of LNDs, greater financial resources could be available to rural America as a whole and agriculture-dependent states in particular.

Greater financial resources will provide greater security to the future of America’s food production, the values and lifestyle found in farm/ranch country, and the capital critical to America’s farm/ranch industry.

Conclusion

LNDs represent a critical tool for agricultural landowners that can strengthen rural communities and entice better stewardship of America’s farm and grazing lands. Like all tools, LNDs can be misused. Such misuse can erode both the credibility of a taxpayer and the willingness of the IRS to readily allow these deductions, ultimately harming the agricultural community as a whole. Proper soil sampling, consistent testing depths, scientifically supported baselines, and usage/amortization rates can aid farm and ranch professionals in more accurately quantifying, documenting, and defending legitimate LNDs. Good tax advisors, experienced legal counsel, and financial advisors are well worth the cost in pursuing a successful and profitable LND strategy.