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August 3, 2020

Ms. Maggie Stehn
Office of Associate Chief Counsel
CC:PA:LPD:PR (REG-112339-19)
Room 5203
Internal Revenue Service
P.O. Box 7604
Ben Franklin Station
Washington, DC 20044

Re: Credit for Carbon Oxide Sequestration
IRS Docket ID REG-112339-19

Dear Ms. Stehn:

The National Waste & Recycling Association (NWRA) appreciates the opportunity to provide comments on the Internal Revenue Service's (IRS) proposed rule on Credit for Carbon Oxide Sequestration (85 FR 30,050) under Section 45Q of the Internal Revenue Code (Code). NWRA is a trade association that represents private-sector waste and recycling companies in the United States, and manufacturers and service providers who do business with those companies. NWRA's members operate in all fifty states and the District of Columbia. NWRA provides leadership, education, research, advocacy, and safety expertise to promote North American waste and recycling industries, serve as their voice, and create a climate where members prosper and provide safe, economically sustainable, and environmentally sound services.

NWRA members are interested in the proposed action as they operate hundreds of landfills that manage landfill gas (LFG) with the resultant carbon oxides released to the atmosphere. The credits for carbon oxide sequestration could provide opportunities to our members to invest in projects to redirect those emissions for utilization or secure geological storage. However, we are concerned that, as written, the proposed rule may foreclose eligibility for many of our members, disincentivizing a large portion of the landfill sector from implementing carbon capture projects.

Background

Municipal solid waste (MSW) landfills generate LFG, which is composed of approximately fifty percent methane and fifty percent carbon dioxide (CO₂).¹ LFG is biogas that is generated through the decomposition and digestion of organic matter deposited at landfills. Other facilities that generate biogas include wastewater treatment plants and anaerobic digestion facilities. Federal regulations require large MSW landfills to install and operate LFG collection systems that route the LFG to facilities for thermal destruction or beneficial use. The collected LFG is typically (1) combusted in a flare, (2) combusted for industrial heating or electricity generation, or (3) processed to generate a biomethane product for subsequent sale or beneficial use.² **Under each of these typical practices, the CO₂ portion of the LFG and the CO₂ that is generated in the combustion of the LFG is vented to the atmosphere.**

NWRA appreciates the IRS's efforts in proposing much needed clarity on how taxpayers may qualify for tax credits under Section 45Q of the Code (Section 45Q credits) and pursue new investments in carbon capture projects. With additional regulatory clarity specific to the landfill sector, our industry can be confident on Section 45Q credit eligibility, allowing our members to take additional action to reduce emissions of CO₂ from our facilities. As discussed in more detail below, we see multiple routes for establishing Section 45Q credit eligibility for MSW landfills.

I. THREE POTENTIAL PATHWAYS FOR LANDFILL ELIGIBILITY UNDER SECTION 45Q

As discussed above, collected LFG is typically either (1) flared, (2) combusted for industrial heating or generation of electricity, or (3) processed to generate a biomethane product for injection into natural gas pipelines and used as transportation fuel or in other applications. Our industry is actively evaluating cost-effective options to reduce our overall emissions footprint even further by capturing and permanently isolating CO₂ that our facilities would otherwise release into the atmosphere. Therefore, we are seeking clarification that each of the three pathways for capturing CO₂ from our facilities would support Section 45Q credit eligibility.

A. Capture of CO₂ from a Flare

The process of extracting LFG from MSW landfills involves installing a series of vertical or horizontal wells into the waste and connecting those wells to a network of pipes that collects the LFG using a blower to induce a vacuum on the system. In many instances, the system routes the collected LFG to a flare where it is combusted,

¹ LFG also can include water vapor, nitrogen, oxygen, hydrogen, and trace levels of other species such as non-methane organic compounds and sulfides.

² See 40 C.F.R. §§ 60.333(c), 60.333f(c), 60.752(b)(2)(iii), and 60.762(b)(2)(iii).

converting the methane component of the gas to CO₂ before venting the gas stream to the atmosphere.

In lieu of releasing this CO₂ directly to the atmosphere, our industry seeks clarification on whether separating and capturing the CO₂ stream from the flare stack gas³ and processing it for utilization or storage would qualify for the Section 45Q credit. For example, the flare stack gas could be routed to a flue gas scrubber for cooling and removal of detrimental constituents, then routed to an amine absorber tower for absorption and separation of the CO₂ from the flue gas. The rich amine solution would then be routed to a desorber for heating, release of the CO₂, and regeneration of the amine solvent. The CO₂ stream would then be compressed and dried for subsequent transport and utilization or sequestration. No mechanical or electric power would be produced.

In this instance, the flare facility would satisfy the definition of an “industrial facility” as “a facility that produces a carbon oxide stream from a fuel combustion source.”⁴ For this scenario which involves flaring, it would be helpful to clarify two points. First, the fuel combustion source need not result in electrical or mechanical power being generated. Second, only equipment with a primary purpose and function to capture CO₂ that is then transported for disposal, injection or utilization would be characterized as “carbon capture equipment.”⁵ In other words, equipment that is used to extract LFG from MSW landfills that is then flared would not be carbon capture equipment because the equipment does not purposefully capture CO₂ that is then transported for disposal, injection or utilization (i.e., the CO₂ is emitted before any of those subsequent potential steps).

B. Capture of CO₂ from an LFG-to-electricity facility

A second option is to route the collected LFG to a gas turbine or internal combustion engine to produce electricity to sell commercially or use onsite. LFG-to-electricity facilities typically compress the gas to required pressure for the combustion device, remove free water, then combust the gas in engine-generators or turbine-generators to produce electricity. The exhaust gas from the combustion is typically vented to atmosphere.

Rather than releasing the CO₂ directly to the atmosphere, it is possible to capture the CO₂ stream from the LFG-to-electricity stack and process it for utilization or storage. Similar to the process described above for capturing CO₂ from a flare, the stack gas could be routed to a flue gas scrubber for cooling and removal of detrimental constituents, then routed to an amine absorber tower for absorption and separation of the CO₂ from the flue gas. The rich amine solution would then be

³ Stack gas is the gas passing through a stack following combustion. The gas typically contains nitrogen, oxygen, carbon dioxide, and water vapor as primary constituents.

⁴ 85 Fed. Reg. at 34,070.

⁵ *Id.* (providing that carbon capture equipment is “used to capture or process carbon oxide until the carbon is transported for disposal, injection, or utilization”).

routed to a desorber for heating, release of the CO₂, and regeneration of the amine solvent. The CO₂ stream would then be compressed and dried for subsequent transport and utilization or sequestration.

NWRA seeks clarification on whether the LFG-to-electricity facility would satisfy the definition of an “industrial facility” as “a facility that produces a carbon oxide stream from a fuel combustion source.”⁶ The equipment used to capture the CO₂ from the LFG-to-electricity stack also would qualify as “carbon capture equipment” as it would serve the primary function and purpose of separating, capturing, and processing the CO₂ until it is transported for utilization or storage.⁷ Even though electricity is generated, an LFG-to-electricity facility would not be considered as an “electricity generating facility” because LFG-to-electricity facilities are not “Electric Utility Hydraulic Production Plants” subject to depreciation under MACRS Asset Class 49.11, “Electric Utility Nuclear Production Plants” subject to depreciation under MACRS Asset Class 49.12, “Electric Utility Steam Production Plants” subject to depreciation under MACRS Asset Class 49.13, or “Electric Utility Combustion Turbine Production Plants” subject to depreciation under MACRS Asset Class 49.15. Rather, LFG-to-electricity facilities are considered as “Waste Reduction and Resource Recovery Plants” subject to depreciation under MACRS Asset Class 49.5.

C. Capture of CO₂ from an LFG Processing Facility

A third option for our industry is to route the LFG to an LFG processing facility where it is upgraded to produce a biomethane product for use as transportation fuel and for other applications. Within an LFG processing facility, various processing steps occur which involve compressing the gas to a required product pressure and separating compounds other than methane from the gas stream. Combinations of unit operations, including scavenger beds, pressure-swing adsorption units, temperature-swing adsorption units, physical solvent-based absorbers, chemical solvent-based absorbers, cryogenic separation columns, and membranes, can be used to purify the gas stream to generate a biomethane product. The process also typically yields an off-gas which contains methane, CO₂, oxygen, nitrogen, water vapor, non-methane organic compounds, and sulfides. The off-gas is typically sent to a thermal oxidizer or process flare for thermal conversion of the combustible species, and the CO₂ is eventually vented to atmosphere.

Rather than releasing the CO₂ to the atmosphere, it is possible to separate and capture the CO₂ from the biomethane manufacturing process and further process the CO₂ so that it can be utilized or sequestered. For example, specialized pressure-swing adsorption units, membrane packages, liquefaction equipment, or amine absorption units could be used to selectively capture CO₂ from the gas to generate a suitably pure CO₂ stream for subsequent pumping or compression and downstream utilization or sequestration.

⁶ 85 Fed. Reg. at 34,070.

⁷ *See id.*

In this instance, the LFG processing facility would satisfy the definition of an “industrial facility” as “a facility that produces a carbon oxide stream from . . . a manufacturing process.”⁸ LFG processing facilities would qualify as “manufacturing processes” to the extent that they manufacture a biomethane product that is sold on the market or is used for the commercial purpose of fueling collection vehicles that otherwise would run on conventional natural gas.⁹

The equipment used to separate and capture the CO₂ from the LFG and further process the CO₂ would qualify as “carbon capture equipment” as it would serve the primary function and purpose of capturing or processing the CO₂ until it is transported for utilization or storage.¹⁰ The equipment used to process LFG upstream from the CO₂ separation equipment would not constitute carbon capture equipment, nor would the equipment used to process the biomethane downstream from the CO₂ separation equipment. That is, the new equipment which would be added to a biomethane processing facility to separate or capture the CO₂ that otherwise would be routed to a thermal oxidizer or process flare along with other LFG constituents and eventually vented to atmosphere would constitute the carbon capture equipment. NWRA is not aware of any LFG processing facilities which include equipment which captures and processes CO₂ such that a CO₂ stream is generated and of suitable quality for transport, disposal, injection, or utilization, and, as such, submits that the 80/20 Rule would not apply to the retrofit of existing biomethane processing facilities.¹¹ However, in the unlikely event that an LFG processing facility already contains carbon capture equipment and the fair market value of the used components of carbon capture equipment is not more than 20 percent of the carbon capture equipment’s total value (the cost of the new components of property plus the value of the used components), the carbon capture equipment would satisfy the 80/20 Rule and qualify as originally placed in service.

We are seeking the IRS to clarify that carbon capture equipment may be owned by the taxpayer other than the taxpayer who owns the industrial facility at which such carbon capture equipment is placed in service regarding all three pathways for capturing CO₂ from our facilities.

⁸ 85 Fed. Reg. at 34,070.

⁹ *See id.* (defining “manufacturing process” as “a process involving the manufacture of products, other than carbon oxide, that are intended to be sold at a profit, or are used for a commercial purpose”).

¹⁰ *See id.*

¹¹ Typical LFG processing facilities contain equipment, such as membrane packages, pressure-swing adsorption units, or physical solvent-based absorbers, which lead to separation of CO₂ along with other constituents of LFG in an effort to generate a biomethane product. However, the purpose of these typical separation processes is not to capture carbon dioxide, and the typical processes do not lead to a CO₂ stream of necessary quality for subsequent utilization or sequestration, so should not be considered carbon capture equipment. Additional equipment would be necessary to separate and capture the CO₂ from the other LFG constituents in a manner such that the CO₂ is of necessary quality for transport and subsequent utilization or sequestration. This additional equipment should be considered carbon capture equipment. For further clarity, NWRA requests that the IRS consider updating 1.45Q-2(c) to emphasize that carbon capture equipment includes components of property the primary purpose of which is to capture or process carbon oxide.

II. AGGREGATION OF FACILITIES FOR PURPOSES OF MEETING SECTION 45Q(D)(2) THRESHOLDS

Most MSW landfills emit between 10,000 and 100,000 metric tons per year of CO₂. Although many of these sites theoretically would be eligible for Section 45Q credits by meeting the 25,000 metric tons per year threshold requirement for utilization projects, these projects are not yet commercially proven or feasible. As such, our industry's primary focus currently is on sequestering CO₂ captured at MSW landfills in secure geological storage.

NWRA estimates that approximately ten percent of individual MSW landfill sites emit in excess of 100,000 metric tons per year of CO₂, theoretically leaving the other ninety percent of MSW landfills ineligible for the Section 45Q sequestration tax credit. In certain circumstances, however, we believe that the statute allows for CO₂ captured from separate facilities that include carbon capture equipment to be grouped together for purposes of meeting the 100,000 metric tons per year threshold. The statute provides that the 100,000 metric tons per year threshold that must be met to be eligible for the Section 45Q credit applies to "any facility not described in subparagraph (A) or (B)."¹² Although the statute does not define the term "a facility," the IRS has allowed for the aggregation of multiple facilities for purposes of compliance with other subsections of the statute. Accordingly, our members seek feedback on whether the IRS could support either of two related aggregation concepts, both of which appear to be consistent with the overall statutory construct.

A. Single Program – Relevant Facts and Circumstances

Several IRS Notices allow for a disparate group of energy properties to be operated as a single project for the purpose of determining whether construction of the qualified facility that includes the carbon capture equipment began prior to 2024, as required for Section 45Q credit eligibility. These notices clarify that aggregation of multiple facilities as a single project is driven by "relevant facts and circumstances," including ownership by a single legal entity, construction on contiguous pieces of land, and common permits.¹³

NWRA requests that the IRS extend the "single project" concept for purposes of determining beginning of construction to allow for CO₂ captured by separate facilities to be treated as captured by a single qualified facility for purposes of satisfying the minimum threshold emissions or capture requirements under Section 45Q(d)(2) if separate units of carbon capture equipment were developed, constructed, or are managed pursuant to a single program. Similar to the factors that the IRS considers in determining whether multiple energy properties are

¹² 26 U.S.C. § 45Q(d)(2)(C).

¹³ See Notices 2020-12 § 8.01, 2018-59 § 7.01, 2016-31 § 4.02; see also Notice 2013-29 § 4.04(2).

operated as part of a single project, the IRS should consider the following factors in satisfaction of the definition of a facility” in the subsection at issue:

- a. the units of carbon capture equipment are owned by the same legal entity;
- b. the units of carbon capture equipment are commonly managed or operated;
- c. the units of carbon capture equipment are operated under similar operations and maintenance protocols established by the owner of the equipment, taking into account differences attributable in resource utilization and expected use of captured carbon oxides;
- d. the units of carbon capture equipment are constructed pursuant to a single plan for Front-End Engineering and Design (FEED) or other approaches for front-end planning (e.g., the Front-End Loading (FEL) approach);
- e. the carbon oxide captured with the carbon capture equipment is transported, disposed of, or utilized or used as a tertiary injectant pursuant to a shared contract;
- f. the units of carbon capture equipment were constructed pursuant to a single construction management contract; and
- g. if construction of any unit of carbon capture equipment was debt financed, construction of all units of carbon capture equipment is financed pursuant to a single loan agreement.

B. Single Taxpayer – Aggregation from Multiple Sites

An alternative approach is to allow for the aggregation of captured CO₂ at multiple sites to satisfy the minimum threshold emissions or capture requirements under Section 45Q(d) for sites that are part of the same affiliated group within a single taxpayer. Generally, each MSW landfill is owned by a separate corporation to limit environmental impairment liability exposure. The corporations file a consolidated income tax return as a single taxpayer and are filing a consolidated tax return.

Although the statute is silent as to the meaning of “a facility” under Subsection (d)(2), it would appear to frustrate Congressional intent to exclude industrial facilities that include carbon capture equipment that are a part of an affiliated group from qualifying for Section 45Q credits. NWRA thus seeks the IRS’s input on whether the statutory construct supports the application of the Emissions and Capture Requirements test at the taxpayer level by treating an affiliated group within the meaning of Section 1504.

Combined, a group of landfills that are members of a single business venture and owned by the parent company would likely satisfy the minimum threshold emissions or capture requirements under Section 45Q(d). This approach to the

aggregation of multiple sites for purposes of threshold emission or capture requirements under Section 45Q(d) eliminates subjectivity in deciding whether sites are operated as a single program and allows for consistency.

A similar method was adopted for purposes of tax credits governed by multiple other Code sections. For instance, the general business credit limitation rules in Section 38(c)(1) is applied at the affiliated group level. The same approach was taken by the regulation Section 1.1502-3(f), which provides that the transfer of property between members of an affiliated group does not result in investment tax credit recapture. Similarly, a sale of property between members of the same affiliated group does not result in the change of the basis of the property for investment tax credit purposes.¹⁴ Importantly, the referenced consolidated return regulations were implemented many years ago and Congress has not determined it was necessary to alter them by statute. Therefore, it is reasonable to assume that aggregation of multiple facilities that are members of the same affiliated group, within the meaning of Section 1504, for purposes of satisfying Section 45Q(d) threshold emissions or capture requirements would be within authority of Treasury and the IRS.

The metric ton requirements appear intended to ensure that the number of taxpayers claiming Section 45Q tax credits is at a level the IRS can administer. Allowing single taxpayers or affiliated groups to aggregate their numbers to satisfy the metric ton requirement would be consistent with that policy as only a small number of taxpayers are likely to meet the metric ton requirements on an aggregated basis.

NWRA requests that multiple sites that are owned by a single taxpayer or members of the same affiliated group within the meaning of Section 1504 be aggregated file a consolidated tax return for purposes of applying the carbon emission and capture metric ton threshold under Section 45Q(d).

III. RECOMMENDATIONS

Recommendation 1. Clarify in Section 1.45Q-2(d)(4) of the final rule or the accompanying preamble discussion that the following means of capturing CO₂ from biogas facilities for utilization or storage would qualify for the Section 45Q credit as an industrial facility:

(4) Examples. The following examples illustrate the rules of paragraph (a) and (d)(3) of this section:

...

(ii) Taxpayer C collects biogas from municipal solid waste landfills, wastewater treatment plants, or other organic waste anaerobic digestion facilities. The biogas

¹⁴ Treas. Reg. §1.1502-3(g)(2).

is composed of approximately 50 percent carbon dioxide and approximately 50 percent methane by volume. The collected biogas is flared onsite. Taxpayer C constructs process equipment that captures and separates the carbon dioxide from the stack gas. No electric or mechanic power is being produced. The carbon dioxide is captured by the taxpayer and disposed of in secure geological storage. Because the carbon dioxide stream is produced from a fuel combustion source, the flaring facility is an industrial facility within the meaning of subsection (d). The carbon dioxide captured by the process is qualified carbon oxide.

(iii) Taxpayer D collects biogas from municipal solid waste landfills, wastewater treatment facilities, or other organic waste anaerobic digestion facilities. The biogas is composed of approximately 50 percent carbon dioxide and approximately 50 percent methane by volume. Taxpayer D combusts the LFG to power a generator that produces electricity. Taxpayer D constructs process equipment that captures and separates the carbon dioxide from the stack gas. The carbon dioxide is captured by the taxpayer and disposed of in secure geological storage. Because biogas-to-electricity facilities are "Waste Reduction and Resource Recovery Plants" subject to depreciation under MACRS Asset Class 49.5, the facility is not an electric generating facility. Because the carbon dioxide stream is produced from a fuel combustion source, the biogas-to-electricity facility is an industrial facility within the meaning of subsection (d). The carbon dioxide captured by the process is qualified carbon oxide.

(iv) Taxpayer E collects biogas from municipal solid waste landfills, wastewater treatment facilities, or other organic waste anaerobic digestion facilities. The biogas is composed of approximately 50 percent carbon dioxide and approximately 50 percent methane by volume. Taxpayer E processes the biogas in a gas processing facility to produce a biomethane product. The carbon dioxide would ordinarily be released into the atmosphere, but Taxpayer E constructs process equipment that captures and separates the carbon dioxide for secure geological storage. To the extent the biomethane product is sold on the market or is used for the commercial purpose of fueling vehicles that otherwise would run on conventional natural gas, and carbon dioxide is not the only product manufactured that is intended to be sold at a profit or used for a commercial purpose, the separation process applied to the gases is a manufacturing process within the meaning of subsection (d)(3). Because the carbon dioxide stream is produced from a manufacturing process, the biogas processing facility is an industrial facility within the meaning of subsection (d). The carbon dioxide captured by the process is qualified carbon oxide.

Recommendation 2. Clarify in section 1.45Q-2(c) of the final rule or the accompanying preamble discussion that carbon capture equipment may be owned by a taxpayer other than the taxpayer who owns or operates the industrial facility at which such carbon capture equipment is placed in service.

Recommendation 3. Clarify in section 1.45Q-2(c)(3) of the final rule or the accompanying preamble discussion that, in the context of a biogas processing facility, carbon capture equipment is limited to the equipment with the primary purpose and function to capture CO₂ from LFG or stack gas in a manner such that the CO₂ can then be transported, sequestered or utilized and does not include equipment upstream from the CO₂ capture equipment nor the equipment used to process the biomethane downstream from the CO₂ capture equipment.

Recommendation 4. Clarify in the final rule that:

Carbon oxide captured by separate facilities may be treated as captured by a single qualified facility purposes of Section 45Q(d) if separate units of carbon capture equipment were developed, constructed, or are managed pursuant to a single program based on relevant facts and circumstances including:

(a) the units of carbon capture equipment are owned by the same legal entity;

(b) the units of carbon capture equipment are commonly managed or operated;

(c) the units of carbon capture equipment are operated under similar operations and maintenance protocols established by the owner of the equipment, taking into account differences attributable in resource utilization and expected use of captured carbon oxides;

(d) the units of carbon capture equipment are constructed pursuant to a single contract for Front-End Engineering and Design (FEED) or other approaches for front-end planning (e.g., the Front-End Loading (FEL) approach);

(e) the carbon oxide captured with the carbon capture equipment is transported, disposed of, or utilized or used as a tertiary injectant utilized pursuant to a shared contract;

(f) the units of carbon capture equipment were constructed pursuant to a single construction management contract; and

(g) if the construction of any unit of carbon capture equipment was debt financed, construction of all units of carbon capture equipment is financed pursuant to a single loan agreement.

Alternatively, the following clarification can be provided:

Multiple sites will be treated as a single facility solely for purpose of determining compliance with the minimum threshold emissions and capture requirements under Section 45Q(d) if the sites are owned by a single taxpayer, where corporations that are members of an affiliated group within the meaning of Section 1504 are treated as a single taxpayer.

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NWRA appreciates the opportunity to comment on the proposed rule, and we look forward to continuing to work with your office on ensuring that our sector is eligible for Section 45Q credits. Should you have any questions, please call Anne Germain at 202-364-3724 or e-mail at agermain@wasterecycling.org.

Very truly yours,

A handwritten signature in black ink that reads "Darrell K. Smith". The signature is written in a cursive style with a large initial 'D' and 'S'.

Darrell K. Smith, PhD
President & CEO