PUTNAM COUNTY BOARD OF ZONING APPEALS
MINUTES

The Putnam County Board of Zoning Appeals met for its regular monthly meeting on January 10, 2022, at 7:00 p.m. in the Commissioner's Room of the Putnam County Courthouse, 1 Courthouse Square, Greencastle, IN 46135. Kevin Scobee called the meeting to order at 7:00 p.m. Amanda Sanders took a roll call to determine a quorum. The following members were present: Kevin Scobee, Randy Bee, Ron Sutherlin, and Lora Scott. Raymond McCloud was not present at the meeting. Also, present were Jim Ensley, County Attorney; and Amanda Sanders, Planning Department Office Manager. Also present was the Audience; see attached sign in sheet.

REVIEW OF MINUTES:

Kevin Scobee asked if there were any corrections or additions to the December 13, 2021, meeting minutes.

Randy Bee stated that on the first page, the first paragraph, says Raymond McCloud called the meeting to order, but Raymond was not at the meeting, that should be Kevin Scobee called the meeting to order.

Lora Scott stated that on page 1 under review of minutes, Ron Sutherlin's name is spelled wrong. Mrs. Scott made a motion to approve the December 13, 2021, meeting minutes as corrected.

Randy Bee seconded the motion. The December 13, 2021, minutes were approved contingent on corrections being made with all in favor.

ELECTION OF OFFICERS:

Mr. Scobee suggested tabling the election of officers until the full board was present.

Ron Sutherlin made a motion to table the election of officers until the February meeting.

Mrs. Scott seconded the motion.

The election of officers was tabled until the February meeting with all in favor.

OLD BUSINESS:

2021-BZA-37: MIKE SULLIVAN – SPECIAL EXCEPTION: To an RV Resort in an Agricultural District; Zoned A1; Cloverdale Township; 5/12N/4W (1391 W CR 1050 S Cloverdale).

Roger Azar, Deckard Engineering, approached the board on behalf of the petitioner. Mr. Azar explained that the questions from the November meeting were addressed and submitted to the plan director. Mr. Azar stated that the fact that there is no plan commission that will be taken on the review, this Board has requested complete design before approval. Mr. Azar explained that for Mr. Sullivan to get the financing needed to complete the design criteria for this project, approval is needed. Mr. Azar explained that the Plan Director had presented to the Plan Commission the idea of them taking on subdivision review, which this project would fall under. Mr. Azar stated that the Plan Commission was very favorable with taken on the review of those projects, however they requested a fee scheduled. Mr. Azar requested that, if this project meets the requirements for the BZA for special exception, approval with conditions be granted. Mr. Azar explained that approval with conditions

means that yes this meets the requirements, yes this is a special exception to have an RV Park in Agriculture zone; however, the conditions of approval are that this project does not proceed any further until a full design is either submitted to this board or to the Plan Commission. Mr. Azar stated that that approval would allow Mr. Sullivan to get the financing needed to get the full design. Mr. Azar explained that this would not be an approval stating that this project is ready to go and start digging up the ground. Mr. Azar stated that he has completed the drainage study. Mr. Azar explained that twelve neighbors have signed a 'No Issue with Development' paper. Mr. Azar stated that all the calculations that the Board required have been completed.

Mrs. Scott stated that in the information that was submitted in December, there was a lot of data. Mrs. Scott asked for a summary of the data.

Mr. Azar presented responses to comments received document to the board. Mr. Azar stated that they concur with all the comments with everything. Mr. Azar presented the Standard Operating Procedures for the RV park to the Board.

Mrs. Scott explained that the response to comments that was provided in the packet was for the wrong development. Mrs. Scott stated that the response to comments that was in the packet for the December meeting were the correct ones.

Mr. Azar stated that preliminary design notes were provided showing the RV will have the minimum separation distance, the entrance will have adequate radii of turn, the layout for the cabins, and topography and water flow. Mr. Azar explained that in the drainage report it shows that the two existing ponds are adequate to carry any drainage from the development. Mr. Azar presented the signatures of those who have no issues with the development. Mr. Azar also presented an aerial showing the western boundary of the property. Mr. Azar stated that there are trees already along the west line, however additional tress could be planted if required.

Mrs. Scott stated that in the comments of those objecting to the project, a consistent objection was the road and how narrow it is. Mrs. Scott explained that she drove down the road and concurs that it is a narrow road.

Mr. Azar stated that the highway department will be resurfacing the road. Mr. Azar explained that a request to drop the speed limit could be requested from the commissioners. Mr. Azar stated that the county does not have a plan to widen the road. Mr. Azar explained that most county roads are like that.

Mrs. Scott stated that the issue was turning onto State Road 243, as that is a dangerous intersection especially for larger vehicles. Mrs. Scott explained that she was concerned about the intersection at State Road 243 and County Road 1050 South.

Mr. Azar explained that if the Indiana Department of Transportation (INDOT) deems this intersection unsafe, INDOT could require the developer to admend the entrance onto the county road or INDOT will admin the intersection. Mr. Azar stated that they cannot do anything within INDOT's eighty (80) feet right-of-way. Mr. Azar explained that INDOT does traffic studies. Mr. Azar stated that he will contact INDOT Crawfordsville District as he begins the design of the RV Park to get guidance from them.

Mrs. Scott asked if the INDOT Crawfordsville office covers that area.

Mr. Azar stated that he would double check, but he believed the Crawfordsville office covered the area.

Mr. Scobee stated that he had asked for information from Mr. Rickets. Mr. Scobee explained that the Mr. Rickets was okay with the project.

Mrs. Scott stated that he had some reservations about the condition of the road, how narrow it is, and the entrance. Mrs. Scott explained that she believed that Mr. Ricketts had concerns for the line of site at the entrance of the County Road.

Mr. Scobee stated that Mr. Rickets was not against the project.

Jim Ensley stated that as far as the road schedules go, the seven-year plan will be maintained. Mr. Ensley explained that Mr. Ricketts no longer works for the highway department.

Mrs. Scott asked if the schedule was accessible to the public.

Mr. Ensley stated that you can contact the highway department which road are scheduled to be repaved.

Mr. Scobee stated that this case would continue through the BZA. Mr. Scobee explained that there were some items that could require review from other boards, like drainage.

Mr. Azar stated that if the board granted approval today without conditions, then that is a green light to start construction. Mr. Azar explained that what they are requesting is for conditional approval so that the full design could be brought back to either this board or the plan commission. Mr. Azar stated that the plan commission would then have the option to deny or approve the design of the RV Resort. Mr. Azar stated that if it goes to the plan commission, then the BZA portion is verifying that this meets the special exception requirements under agricultural. Mr. Azar explained that if the plan commission does not take this on, then the design would come back before this board for final review and approval.

Mr. Bee explained that it was his understanding that the highway superintendent that the county is looking to hire someone with an engineering background.

Mr. Ensley stated that the commissioners are looking at hiring an engineer.

Mr. Bee asked if a situation like this would be reviewed by him or the plan commission.

Mr. Ensley stated that he was not sure as a project like this has not come in front of the board before.

Mr. Bee stated that before he would sign off on anything, a subcontractor would need to review the design as a double check.

Mr. Ensley stated that what they are requesting is like a major subdivision. Mr. Ensley explained that it is a step process, approval only moves this to the next step in the process, it is not a final approval for construction. Mr. Ensley stated that the request was a preliminary. Mr. Ensley explained that the confusion lies in that since the board last met, money was found and a greenlight to move forward to draft a new zoning ordinance and comprehensive plans was obtained. Mr. Ensley stated that any changes that were planned, is on hold as the new ordinances are drafted. Mr. Ensley explained that approval tonight does not mean that the project cannot be denied in the next step.

Mrs. Scott asked Mr. Sullivan if one-night stays were still the plan.

Mr. Sullivan stated that was correct, with the longest stay being a week. Mr. Sullivan explained that there would not be year-round camping at the site.

Mrs. Scott stated that in the standard operating procedures it states "reservations may be made for a period of thirty (30) days, after thirty (30) days the guest shall depart for seven (7) days before beginning a new reservation. Extensions without the seven (7) day check out maybe given based on availability and manager's discretion." Mrs. Scott explained that it appears that it is anticipated that campers will be able to park there for extended periods.

Mr. Sullivan stated that was not the plan. Mr. Sullivan explained that there may be a few that will want to stay for the entire month. Mr. Sullivan stated that the average would be a week, with the majority being on the weekends.

Mrs. Scott stated that a lot of engineering information was shared, but not a lot of marketing information was shared. Mrs. Scott explained that it was indicated that the luxury market was the aim. Mrs. Scott asked about the plan for reaching that market.

Mr. Sullivan stated that he has hired an RV consultant. Mr. Sullivan explained that this project will be in stages. Mr. Sullivan stated that advertising would be done through this consultant.

Mrs. Scott explained that she had done some research on travel parks. Mrs. Scott stated that to reach that luxury market there was a pull to get them there. Mrs. Scott explained that this appears to be more of an in and out, like a motel on wheels.

Mr. Sullivan stated that the reason he purchased the property is because it is off I-70. Mr. Sullivan explained that the consultant had analyzed the prospects. Mr. Sullivan stated that a lot of revenue is lost because there is nowhere for these to go. Mr. Sullivan explained that the only place in Indiana that can handle this type of camper is a KOA in Greenfield that is really outdated. Mr. Sullivan stated that there is not a place for the newer RVs with a double pop out. Mr. Sullivan explained that the busy time will be late spring, summer, and early fall.

Mrs. Scott stated that it comes down to the findings of fact for a special exception. Mrs. Scott explained that in order for the board to grant a variance request, there are criteria that has to be established. Mrs. Scott read the findings of fact for a special exception as follows:

"In order for the special exception to be granted, the Board must find in writing that: (1) The establishment, maintenance, or operation of the special exception will not be injurious to the public health, safety, or general welfare of the community; (2) The special exception will not effect the use and value of the other property in the immediate area in a substantially adverse manner; and (3) The establishment of the special exception will be consistent with the character of the district (particularly that area immediately adjacent to the special exception) and the permitted land use. The board may impose conditions as part of its approval to protect the public health, and for reasons of safety, comfort, and convenience."

Mr. Sutherlin asked how long Mr. Sullivan has had the property.

Mr. Sullivan stated about eight years. Mr. Sullivan explained that there are already RVs that go down this road. Mr. Sullivan stated that the road does need to be better, but he has not seen any accidents at the intersection of County Road 1050 South and State Road 243. Mr. Sullivan explained that there may have been accidents in the past, but not within the eight years that he has been at the property.

Mr. Azar stated that whatever concerns that the board put those as conditions of approval. Mr. Azar explained that if the road is a concern and the board wants INDOT to get involved, it would be a condition of approval. Mr. Azar stated that if the conditions are not met then the project would be denied.

Mrs. Scott stated that her concern is the roads.

Mr. Azar stated that he would address the road with INDOT to determine if the intersection needs to be changed.

Mrs. Scott stated that INDOT would need to do a traffic study and a line-of-sight analysis. Mrs. Scott explained that the math shows in a letter of objection to the board, if you are running at 40% capacity, that would be 40 campers per night.

Mr. Azar stated that it could be ten (10) campers per night if some are there for a week. Mr. Azar explained that even if running at forty percent that does not mean that is the number coming in and out each night.

Mrs. Scott stated that at sixty-five or seventy percent that still is a minimum of twenty-five large vehicles coming in and twenty-five large vehicles going out every day. Mrs. Scott explained that at full capacity there will be an excess of ninety vehicles. Mrs. Scott stated that was a significant increase on a county road.

Mr. Azar stated that the road improvements that the county does will help a lot. Mr. Azar explained that county road is considered a collector road. Mr. Azar stated that INDOT has specific requirements for a collector road. Mr. Azar explained that County Road 1050 South does not meet the requirements for INDOT as a collector, however this is a county road not an INDOT road. Mr. Azar stated that he was not sure if the County had a classification system for the roads.

Mrs. Scott stated that the county has a classification system for all the roads within the county.

Mr. Azar explained that a collector road should be at least eleven-foot width and lanes with two foot of shoulders and three feet of soft shoulder. Mr. Azar stated that most county roads do not meet this requirement. Mr. Azar suggested adding a condition of having a traffic study. Mr. Azar explained that this is just phase one of multiple phases.

Mrs. Scott stated that is not a case of build it and they will come. Mrs. Scott explained that the commitments must be there before approval.

Mr. Sullivan stated that the road measured approximately nineteen feet in width. Mr. Sullivan explained that he was not sure if the county planned on widening the road. Mr. Sullivan stated that there is one area that drops to sixteen feet. Mr. Sullivan presented pictures of the existing conditions of the county road from State Road 234 and County Road 1050 South.

Mr. Bee asked about opposition.

Mr. Scobee stated that the public portion of the meeting has already been conducted.

Mrs. Scott stated that one of the letters of opposition stated that the road above the culvert was fifteen feet wide. Mrs. Scott explained that the road was fifteen to nineteen feet wide. Mrs. Scott stated that Mr. Bedwell measured the road.

Mr. Bedwell stated that it was measured at seventeen feet at the end of his driveway. Mr. Bedwell explained that the area where there is no guardrails or shoulder is fourteen feet at the culvert. Mr. Bedwell stated that there is an area that is washed out, after it was repaired last summer.

Mrs. Anderson stated that Christmas Eve/Morning pictures were taken of the road in front of her house. Mrs. Anderson explained that road would need a lot of work before RVs and campers could come down the road. Mrs. Anderson stated that if a camper had gotten over too far, it would be laying in her front yard because of the washed-out road.

Mr. Scobee asked what the distance was from the State Road to Mr. Sullivan's driveway.

Mr. Sullivan stated that it was a little under four tenths of a mile. Mr. Sullivan explained that Blackhawk Campground was about a mile west of his driveway.

Mrs. Scott stated that this project would increase the probability of incidents occurring by the number of vehicles this project could bring to the area.

Mr. Sullivan stated that the road has not been resurfaced in the eight years that he has lived there. Mr. Sullivan explained that the road is scheduled to be resurfaced.

Mrs. Scott explained that with a new superintendent coming in the resurfacing schedule could be changed. Mrs. Scott stated that her other concern was with the sewer line. Mrs. Scott explained that the sewer line extension being discussed with the Town of Cloverdale, but a timeline has not been established. Mrs. Scott asked if there was a best case estimated date for the sewer extension.

Mr. Azar stated that the Cloverdale Superintendent has shown a lot of interest in extending the sewer line. Mr. Azar explained that the timing and how the sewer line is going to get there will be a part of the complete design. Mr. Azar stated that if the sewer tap cannot be completed, an alternative onsite system would be installed. Mr. Azar explained that a submittal to IDEM for approval is required.

Mr. Sullivan stated that he had communication with Jason Hartman, Town Manager of Cloverdale. Mr. Sullivan explained that the Town is still in the engineering process of extending the sewer line, it is anticipated that it will go down 243, but there is no guarantee until the engineering design is completed.

Mr. Sutherlin stated that there seems to be investors going around the country, building RV parks and then selling them. Mr. Sutherlin asked if the investors were RV investors or someone else.

Mr. Sullivan stated that he is getting the money from the bank.

Mr. Azar stated that there were no outside investors.

Mr. Sutherlin stated that there is not enough information to do a final approval and the only way to get that information is to conditionally approve this.

Mrs. Scott asked what information was needed.

Mr. Sutherlin stated that he needed to see the comprehensive plan, that he needed to so that the county has this road as being repaved, an INDOT study to make sure the intersection is up to standards.

Mr. Scobee stated that biggest issue is the road. Mr. Scobee asked what if we approved this conditionally, then gather more information for the county regarding the road as well as INDOT.

Mr. Azar stated that it is reasonable, but that is up to Mr. Sullivan.

Mrs. Scott stated that other cases that have come before the board, the information that is being requested is public information. Mrs. Scott explained that she would like to see the sewer line schedule.

Mr. Azar stated that if the sewer line is not available, then a septic system would be installed.

Mrs. Scott stated that it should be tabled until the information is obtained. Mrs. Scott explained that these questions should be answered in writing. Mrs. Scott stated that there are still questions that the board does not have the answers.

Mr. Sutherlin stated that this is the first time this type of project has come before the board.

Mr. Scobee agreed that this is the first project of this type.

Mr. Sutherlin stated that a comprehensive plan for the RV park that cannot be done without financing.

Mrs. Scott stated that the petitioner has already spent a lot of money and we still do not have a basic skeleton in order to make a decision. Mrs. Scott explained that she would make a motion to deny the petition as it stands since the case has not been made completely.

Mr. Azar stated that conditional approval to get the engineering done. Mr. Azar explained that there are full design issues that need to be addressed, like water, sewer, highway, etc.

Mrs. Scott stated that the information that is needed is not related to engineering services. Mrs. Scott explained that the issues are about the road and the poor subsoil conditions.

Mr. Sutherlin stated that this project was started in November, the board needs to be able to give them the avenue to get all the information so that it can be evaluated at one time.

Mrs. Scott stated that looking at the roads does not involve extensive engineering.

Mr. Scobee asked if it was up to this board to judge if they must connect to the sewer or put in an onsite system. Mr. Scobee explained that he did not believe that the sewer line was an issue, the road is the biggest issue.

Mr. Bee stated that the road is beyond the developer's control. Mr. Bee explained that it is up to the highway department and/or the Commissioners to determine if they will widen the road.

Mr. Scobee stated that Blackhawk Campground is just down the road and there are RVs that travel the road going to that campground.

Mr. Bee stated that if the board is basing the approval on the condition of the road, that is out of the developer's control. Mr. Bee explained that INDOT would also have to determine if the access needs to be changed.

Mr. Scobee stated that he does not want to drag this out, we need to proceed one way or another.

Mr. Bee stated that the roads could be a part of the conditional approval.

Mr. Azar stated that the roads would be addressed as part of the engineering design, it would be looked at and reviewed. Mr. Azar explained that this board was just looking at the special exception

requirements, the three points that were discussed earlier. Mr. Azar stated that the design would have to be completed, whether it is reviewed by the BZA or the Plan Commission., no one is walking out of here and start digging, there are other issues that need to be addressed with the design.

Mr. Scobee asked for a motion.

Mr. Bee stated that definition needs to be given.

Mr. Ensley stated that any conditions could be placed on this project as the board chooses. Mr. Ensley explained that he understands the trepidation of the financing. Mr. Ensley stated that the petition was asking for conditional approval so proceed with obtaining financing. Mr. Ensley explained this is the first time this type of development has come before the board in his nine years as county attorney. Mr. Ensley stated that the board could approve it with the stipulation that this project come back within ninety days to see what was found out on the roads.

Mr. Sutherlin asked if all the conditions are met but new information is brought forward within those ninety days, could it be denied at that time.

Mr. Ensley stated that it could be taken under advisement with the intent of coming back within ninety days to obtain more information, it could go either way at that point.

Mr. Sutherlin asked if the request is required to move forward.

Mr. Azar stated that if Mr. Sullivan does not have approval for the special exception, he will not be able to get financing.

Mr. Ensley stated that if the board says that a full development plan is needed, the developer is saying a full design cannot be obtained without financing.

Mr. Azar stated that the approval would be conditional so that all engineering design submittal would have to be approved prior to continuing. Mr. Azar explained that the conditional approval would cover the requirement of having sound engineering documents.

Mrs. Scott asked what information would be submitted regarding the questions from INDOT and the highway department.

Mr. Azar stated that he would have to talk to the highway department on the plans for the road, and traffic. Mr. Azar explained that he would also get information from INDOT stating what is required from them. Mr. Azar stated that if a deceleration lane is required from INDOT, this project is dead. Mr. Azar explained that there are a lot of checks and balances that must happen before this project gets built.

Mr. Scobee asked if the board wanted to approve the request or deny it.

Mrs. Scott stated that it could be continued as this is only the second time this project has come before the board to allow for additional time to get the information from the county highway and INDOT.

Mr. Scobee stated that if the conditional approval is granted as submitted, that would include the county road and INDOT.

Mrs. Scott stated not unless it is put into the motion.

Mr. Azar stated that all submittals would have to be reviewed and approved as part of the conditional approval.

Mrs. Scott made a motion to table **2021-BZA-37: MIKE SULLIVAN – SPECIAL EXCEPTION** until such time as information is presented on a traffic study from INDOT, a county road assessment, and a schedule for improvement of the county road.

Mr. Scobee seconded the motion.

Mr. Azar stated that information could not be obtained in a month.

The motion to table **2021-BZA-37: MIKE SULLIVAN – SPECIAL EXCEPTION** died with Lora Scott and Kevin Scobee in favor of tabling the petition; Randy Bee and Ron Sutherlin were opposed to tabling the petition.

Mr. Scobee asked where the board goes from here.

Mr. Ensley stated that this happened at the last meeting, if a motion does not get approved, the case gets continued, or another motion can be made.

Mr. Scobee stated that though the county does not have a highway superintendent, there is an interim superintendent. Mr. Scobee explained that the information that is being requested from the county, there is someone who can answer those questions. Mr. Scobee stated he was not sure about the questions for INDOT.

Mr. Azar explained that he would submit a request for review, INDOT will then require drainage and survey plans with distances and centerline of road. Mr. Azar stated that the INDOT process takes at least six months. Mr. Azar explained that if conditional approval is granted while he is waiting on INDOT he can continue working on the design of the park. Mr. Azar stated that if the board is just wanting information on the roads from the county and INDOT, the project will not be back before the board for six months.

Mr. Ensley stated that Article Five, Section Four of the Rules of Procedures states: "In the event the majority of the vote cannot be achieved, the matter shall be rescheduled to the next regular meeting after request of any board member, petitioner, or remonstrator". Mr. Ensley explained that this project must follow the old Rules of Procedures as this case was submitted prior to the passing of the updated Rules of Procedures.

Mr. Sutherlin asked if new motions could be made.

Mr. Ensley concurred that new motions could be made.

Mr. Sutherlin made a motion to approve **2021-BZA-37: MIKE SULLIVAN – SPECIAL EXCEPTION** with the following conditions:

1. All plans must be submitted and approved by the Board of Zoning Appeals, that includes county road, INDOT, sewage, water, drainage, and complete design
2. Going forward is still under advisement
3. No new information that is brought before the board changes the findings of fact

Mr. Bee seconded the motion.

Mr. Sutherlin asked if there were any amendments to the motion.

The motion to approve **2021-BZA-37: MIKE SULLIVAN – SPECIAL EXCEPTION** with the conditions stipulated in the motion, carried with Kevin Scobee, Ron Sutherlin, and Randy Bee in favor; Lora Scott opposed the motion.

2021-BZA-45: DAMON COX – DEVELOPMENT STANDARDS VARIANCE: to allow two primary dwellings on the same parcel; Zoned A1; Cloverdale Township; 33/13N/3W (5304 E CR 900 S Cloverdale)

Amanda Sanders stated that the petitioner has asked for a continuance because he had to go out of town for business but is also ill.

Mr. Ensley stated that the board needed to vote on whether to continue the Damon Cox petition.

Mr. Bee made a motion to continue **DAMON COX – DEVELOPMENT STANDARDS VARIANCE** until the February 14, 2022, meeting.

Mr. Sutherlin seconded the motion.

The motion to continue **DAMON COX – DEVELOPMENT STANDARDS VARIANCE** was approved with all in favor.

2021-BZA-47: MICHAEL CRANDALL – DEVELOPMENT STANDARDS VARIANCE: to allow a secondary dwelling on one parcel; Zoned A1; Washington Township; 12/13N/5W (3148 W CR 550 S Greencastle)

Mr. Sutherlin asked if Damon was the one that did not show last month.

Mr. Ensley stated that Damon had not published notice in the paper.

Mr. Scobee stated that Crandall was the no show.

Mr. Ensley explained that Damon Cox had not published a notice in the paper, so the board continued the case, now it has been continued again since he is unavailable due to work. Mr. Ensley stated that Mr. Crandall did not show up at the last meeting, but there were remonstrators at the meeting. Mr. Ensley stated that the vote was split on dismissing the Crandall case so it was continued to next meeting per Article Five, Section Four of the Rules of Procedure.

Mr. Scobee asked if Mr. Crandall had called since he was not present at the meeting.

Mrs. Sanders stated that he had not called.

Mr. Scobee made a motion to dismiss **2021-BZA-47: MICHAEL CRANDALL – DEVELOPMENT STANDARDS VARIANCE** for failure to show.

Mr. Sutherlin seconded the motion.

2021-BZA-47: MICHAEL CRANDALL – DEVELOPMENT STANDARDS VARIANCE was dismissed for failure of the petitioner to show up at two consecutive meetings with all in favor.

Someone in the audience asked if Mr. Crandall could try to petition the board.

Mrs. Scott stated that he could a year from the date of this meeting.

Mr. Ensley stated that if he does reapply new notice will have to be sent out. Mr. Ensley explained that if work is started, a permit would have to be obtained, which would be denied. Mr. Ensley stated that if work is started without a permit a stop work order will be issued.

Mr. Bee stated that if the neighbors see any building being done to notify the planning department.

Mr. Scobee asked if there was any additional agenda items or comments.

Mr. Ensley stated that the tower site attorney, Russell Brown, has been in contact with Mr. Robinson on taking the tower out and the drainage issues. Mr. Ensley explained that Mr. Brown and the neighbor are working on everything.

Mr. Sutherlin stated that the tower was down.

There being no other business, Mr. Scobee asked for a motion to adjourn.

Mrs. Scott made a motion to adjourn the meeting.

Mr. Bee seconded the motion.

Meeting adjourned at 8:30 p.m.

Minutes approved on the _____ day of _____ 2022.

Kevin Scobee, Vice-President

PUTNAM COUNTY BOARD OF ZONING APPEALS

January 10, 2022

SIGN IN SHEET

PLEASE PRINT CLEARLY

NAME	ADDRESS
ROGER AZAR, P.E / DES ENG'R	214 E. MAIN CRAWFORDSVILLE IN 47933
Cindy Anderson	1219 W CR 1050 South Cloverdale IN 46120
Mike Sullivan	1391 W. CR 1050 S CLOVERDALE IN 46120
GARY ANDERSON	1219 W C R 1050 South Cloverdale IN 46120
Doug Bedwell	1264 W. CR 1050 So. Cloverdale, IN 46120
Doug S. Bedwell	1264 W CR 1050 S CLOVERDALE IN 46120
Chris Latham	5420 S. CR 300 W. Greencastle
DAVID BLANTON	3190W 550S GRN

PU - Twin Ponds RV Resort | Lidar 2018
Graphic Scale: 1" = 175'
0
175
350
525
790.00
800.00
798.00
800.00
802.00
804.00
806.00
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818.00
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822.00
824.00
826.00
828.00
830.00
832.00

RESPONSE TO COMMENTS

RECEIVED FROM

THE TOWN OF CLOVERDALE

DATED OCTOBER 20, 2021

DES
CIVIL & ENVIRONMENTAL ENGINEERING

RESPONSE TO COMMENTS

Project:	PU - Twin Ponds RV Resort		
Document:	BZA Comments by email dated 10/20/2021		
Responder(s):	Roger Azar, PE	**Date:**	OCTOBER 22, 2021

Item	Reference	BZA Question/Comment	Response/Action
1	Note	Entrance to the park	**CONCUR** – Dimensions to the Park Entrance are provided on Sheet C1.02.
2	Note	Drainage, runoff, retention	**CONCUR** – Drainage patterns throughout the site are presented on Sheet C1.04.
3	Note	Landscaping for screening	**CONCUR** – Existing wooded areas will remain in place on the eastern, northern, and western boundaries of the Resort. Existing trees and wooded areas will serve as a screening buffer. Additional coniferous trees may need to be added on the West portions of the Resort, in specific areas.
4	Note	Detail of the RV parking area (cross section or a larger scale showing width and length, and if possible, showing an RV fully extended to show the separation between each RV spot)	**CONCUR** –The RV parking area (cross section or a larger scale showing width and length, and if possible, showing an RV fully extended to show the separation between each RV spot) is presented on Sheet C1.01.
5	Note	Washroom details (specifically septic areas and option for sewer connection)	**CONCUR** –The washroom detailed layout is presented on Sheet C1.03. The preliminary layout for the sewer system is located on Sheet C1.01.
6	Note	Which cabins would be year-round use	**CONCUR** –Three (3) cabins, shown in blue on Sheet C1.01, are to be occupied year-round.
7	Note	Detail of cabins (floor plans)	**CONCUR** –The cabin detailed layout is presented on Sheet C1.03.

8	Note	Indiana Code on Campgrounds - how this project will meet those codes (I think this is the code they were referring to: https://www.in.gov/health/eph/applications-bulletins-forms-laws-and-regulations/410-iac-6-71-campgrounds/)	**CONCUR** – 410 IAC 6-71 was reviewed in detail. Below are excerpt of actions that will be taken to comply with the IAC. All design parameters pertaining to sanitary sewers, lift stations, and the proposed treatment plant will be submitted and reviewed by the Local Health Department and the Indiana Department of Health for approval and permit issuance. Proposed cabins and RV parking spots are numerically marked and shown on Sheet C1.01. Potable water supply to the RV Resort will be provided through the Town of Cloverdale water supply system. Water distribution system and risers will be designed per IAC. Sewage disposal will be (1) through the Town of Cloverdale sewage district, or by installing an on-site wastewater treatment plant. Either options will be designed and submitted to IDOH for permitting and approval. Sewer connection points and risers will be designed per IAC. The resort provides 5 washrooms on-site. Each washroom has 4 toilet facilities, for a total of 20 on-site toilet facilities; not counting the cabins. IAC requires 1 toilet facility for each 30 occupants. The 20 facilities will be able to serve 600 occupants on-site, far exceeding the expected capacity of the resort (86 RV parking spots). The swimming pool design and installation will be in accordance with 410 IAC 6-2.1 and 65 IAC 20. Three enclosed community dumpsters are shown on Sheet C1.01
9	Note	Water requirements, waste disposal specifically in the above rule	**CONCUR** – Please refer to response #8, above.
10	Note	Operational standards (i.e. length of stay, cost, etc.)	**CONCUR** – An RV Park Standard Operating Procedure (SOP) is attached to this document, and will address items presented in the comment.
11	Note	Rules of Park (lighting, campfires, noise, curfew, etc.)	**CONCUR** – An RV Park Standard Operating Procedure (SOP) is attached to this document, and will address items presented in the comment.
12	Note	Is water supply adequate? Letter for water utility?	**CONCUR** – A letter from the water utility is attached to this document.
13	Note	Number of proposed employees / staff / maintenance / security	**CONCUR** – Three full-time employees will be present onsite. Maintenance and Security staff will be contracted on an as-needed basis.
14	Note	Pond details (discharge, outlets, overflow, etc.)	**CONCUR** – Preliminary Pond details are presented in the attached Drainage Study Report (DSR).
15	Note	Signage	**CONCUR** – Resort signage are presented on Sheet C1.01 and are located at the entrance of the resort. Stop signs, Do Not Park signs, and directional signs will be presented in the final design package.

RESPONSE TO COMMENTS

16	Note	The septic proposed may be technology new to Indiana so you would need to go through the State Board of Health for the proposed system.	**CONCUR** – Sewage disposal will be (1) through the Town of Cloverdale sewage district, or by installing an on-site wastewater treatment plant. Either options will be designed and submitted to IDOH for permitting and approval. Sewer connection points and risers will be designed per IAC.
17	Note	Capacity of 1050 S and documentation that it can handle the additional traffic	**CONCUR** – CR 1050 ranges between 19-feet and 20-feet in width. That conservatively presents 9-foot lanes, each way. With a federal mandate that RVs cannot exceed 8.5 feet in width, the RVs should not encroach on incoming traffic at any time. The rate of RVs using CR 1050 will be based on seasonality and special events in the area; however, with check-in requirements, traffic can be spread out over periods of time that will not cause adverse impacts on CR 1050.
18	Note	Traffic control in to and out of property	**CONCUR** – Traffic into the facility will be controlled by timely check-in of RVs. Vehicular access out of the facility will be controlled by the presence of a stop sign at the exit, out of the Resort.
19	Note	Electric Plan	**CONCUR** – An electric plan will be developed and submitted in concert with Duke Energy for review and approval.

NO ADDITIONAL COMMENTS ARE PROVIDED
END OF RESPONSE TO COMMENTS SECTION

RV Resort Rules and Standard Operating Procedures

Reservations:

The RV sites are intended for rent on a temporary basis and are available to the public.

Throughout the year, reservations may be made for a period of 30 days, after 30 days the guest shall depart for 7 days before beginning a new reservation. Extensions without the 7 day check out maybe given based on availability and manager's discretion. During the nonpeak season of November 1-March 31 long term reservations may be made if space is available.

Reservations can be made Monday-Friday 8:00am – 6:00pm and weekends 9:00am – 5:00pm. The reservation phone number is 317-414-8796. Reservations are made on a first-come, first-serve basis. RV owners will be encouraged to make reservations 12 weeks in advance of arrival.

Pricing:

Peak Season: $60 per night for RVs and $189 per night for Cabins. Rates are subject to change without notice.

Cancellations:

Reservations require full payment at the time the reservations are made. Failure to complete payment will result in the reservation being cancelled. Cancellations shall be made 7 days prior to the date of arrival for a full refund to be issued. Cancellations made within less than a week of arrival will pay a minimum of 1 night stay.

Check-In and Check-Out Policy:

Check-In time begins at 12:00 noon at the Check-In Guest Services Office located at 1931 W CR 1050 S, Cloverdale, IN 46120. Identification cards and/or a credit card placed on file is required at time of check-in. If after-hours check-in is required, the Host Camper on Duty will be available at the cabins located in the Southwestern region of the resort. Check-Out time is no later than 1100. Any late check outs will be billed a 1 night service fee of $75

Patron Responsibilities:

Patrons must personally secure and safeguard their vehicle and any personal belongings. Twin Ponds RV Resort, their agents or employees are not responsible for safekeeping or as bailee of the patron's property. Patron vehicles will be located in an area open to all weather conditions and elements and an area that is utilized by other patrons. Patrons accept and "Assume the Risk" of negligence by other patrons; fire, theft, vandalism, acts of God and any other natural or man-made disasters that may cause damage to or destroy his/her property. It is advised that it is in the patron's best interest to maintain adequate fire, casualty, and liability insurance to insure against the risks described above, at all times. It must be understood that any insurance coverage maintained by Twin Ponds RV Resort does not protect patrons or guests from loss or damage of personal property. Guests are responsible for the upkeep of their assigned RV space.
When not connected to discharge ports, all sewage lines must be raised off the ground, kept level, and secured tightly to prevent leaking. Water hoses should be in operable condition to prevent from any holes or leaks.

Space Regulations:

Each space is only entitled to house one RV and one vehicle per space. Streets, driveways, and open spaces should not house yachts, pontoons or boats, campers, sheds, tents, or unserviceable vehicles. A child shade tent is permissible. Boats and additional trailers shall be kept in the overflow storage area, just north of the check-in area.

Each patron should be considerate of the overall appearance of the RV Park. Personal property must be capable of being stored within each patron's RV at any time. Personal items located on the outside of the guests' RV must be

stored neatly under RV and should not be an excessive amount.

Non-RV household furniture, gymnasium exercise equipment (free weights are an exception), and animal cages are not permitted to be stored outside at any given time. Guests are not permitted to install permanent fences, outdoor appliances, tarps, or shading cloth. Mosquito netting is permitted. Temporary animal fencing (dog must be supervised outside) is allowed.

Clotheslines are not permitted on the premise.

Fire Pits are only permitted in locations where permanent fire pits are provided by Twin Ponds RV Resort. Tiki torches and other forms of contained fires are prohibited. Grilling is permitted, but shall not be done under any awnings or gazebos nor on any wood surfaces.

Propane tanks must be secured at all times to the RV or appropriate equipment. All propane tanks must be tightly secured to prevent leakage.

Amenities:

- 30 amp/ 50 amp / 110 amp electrical outlets
- Water & Sewage available at RV spaces
- Picnic table with gazebo at each space
- Bathhouse
- Coin-Operated Laundry Room
- Picnic Pavilion with charcoal grill
- Business Center inside Guest Services Office
- Dog Park
- Fishing at the onsite ponds
- Host Campers on site for any of your after-hour needs

Quiet Hours:

10:00pm - 7:00am

Quiet hours are to be maintained between the hours of 2200 – 0700. Television and music should be kept at a subdued level at all times. Consideration for other patrons is expected.

Pets:

Pets are allowed at the RV Resort in designated areas if they are on a leash. Unfortunately, we do not accept wolf-hybrids, Rottweilers, and Pit bulls, nor do we accept snakes, ferrets, insects, or any other exotic animals. Pets must be on a leash (no longer than 10ft) at all times, and they are not allowed to be outside RV units without supervision. No pet is allowed to be kept outside restrained to any object, left in a kennel, or unattended at any time. Pet feces must be picked up by pet owner.

Bark Parks are located throughout the Resort, and owners are asked to bring only well-behaved dogs to the park. Owners are responsible and assume any risks for their pets.

Trash Procedures:

Please remove all trash from around your assigned site. Do not leave trash, food, or fish waste outside of the RV. Trash should be placed in the dumpsters located behind the pavilion. This needs to be completed nightly to avoid attracting wildlife.

Pond Rules:

Glass bottles are not allowed around the pond areas. Swimming is strictly prohibited on the Resort ponds. The ponds are home to many wildlife species. Please be especially aware of the nesting and hatching season which occurs from May – October. Do not disturb the nests. If you will be out on the pond area at night, you should only use a flashlight with a red filter. No boating will be allowed on the ponds. Use of the pond areas are at the

patron's risk. Children should be secured at all times, and in the presence of an adult at all times, when around the ponds.

JMCS Services

The 20,000 GPD Bio-Pure® Wastewater Treatment System

INTRODUCTION

Bio-Pure® wastewater treatment systems (WTS) offered by JMCS Services are designed for treating raw domestic sewage using a batch reactor process called an "Intermittent-Cycle Extended-Aeration (ICEA) complete-mix WTS. The system treats wastewater and reclaims high-quality effluent on the basis of extended aeration, clarification, sludge recycling, disinfection, and filtration. It is a complete-mix process with a low food-to-microorganism ratio that causes the digesting microorganisms to become extremely competitive for food which results in a significant reduction in the amount of residual sludge produced.

Figure 1: This 20,000 gpd Bio-Pure wastewater treatment system was installed in 2003 in the City of Paradise, California. Except for a brief period in 2018 when the small building that houses the operating system and electrical panels was destroyed by a fire, this unit has been operating successfully since its installation. It processes wastewater from a large shopping center in the commercial area of the city. The clean effluent is discharged to a leach field beneath the asphalt parking lot of the shopping center.

The Bio-Pure process was originally patented in 1972 and certified by the National Sanitation Foundation (NSF) using C-9 criteria in 1973. The NSF C-9 certification results were obtained from wastewater treatment testing with a Bio-Pure Model 30E 3,000 gpd secondary system. At tertiary level over a 60-day period, pH ranged from 6.8 to 7.5 mg/L, biochemical oxygen demand (BOD_5) was <10 mg/L, suspended solids was <10 mg/L, coliform count ranged from 2 to 5 colonies per 100 ml, dissolved oxygen ranged from 7.4 to 8.5 mg/L, and turbidity ranged from 0.1 to 1.1 NTU.

Although all current production models of Bio-Pure systems employ the same basic ICEA treatment process as was employed in the earliest models manufactured since the 1970's, more recent systems have been continually upgraded with better disinfection (ozone instead of chlorine), denitrification and filtration processes, and more state-of-the-art microprocessor operating systems.

Through the use of ozone disinfection and pressure filtration (optional), effluent from Bio-Pure systems routinely meet or exceed California Title 22 requirements for treated wastewater reclaimed for use as unrestricted food-crop irrigation and full-body-contact recreation water.

After system stabilization (about ten days after startup depending upon influent composition and volume), JMCS Services warrants the discharged effluent to contain ≤20 mg/L BOD_5, ≤20 mg/L total

suspended solids (TSS), ≤10 mg/L total nitrogen, ≤5 NTU turbidity, and ≤10 MPN/100mL of coliform. These design goals are currently being achieved in existing Bio-Pure systems.

SYSTEM OPERATION: 20,000 GPD BIO-PURE WTS

During a normal sequence of operations, the collection system will deliver the wastewater – after screening to remove grit and non-digestable materials (e.g., rocks, plastics, human hair) – to a 10,000-gallon capacity equalization tank and lift station (**Figure 2**). The equalization tank is typically placed underground. From the equalization tank, a float-controlled grinder pump transfers the wastewater into the anoxic tank which overflows to the aeration tank. In the unlikely event that the reserve area of the aeration tank is filled, an override switch will prevent operation of the system feed pump(s) and the influent will collect in the equalization tank to a maximum volume of approximately 5,984 gallons.

Should the influent in the aeration tank rise to set up the condition described above, an alarm will sound to warn the operator to check the system. At this point the 772 gallons reserve in the aeration tank plus the estimated 5,984 gallons available in the equalization tank provide a total reserve (safety) and flow equalization factor of 6,756 gallons or 34% of daily (24-hour) system hydraulic flow design for a 20,000 gpd system design. The projected flow of 16,500 gpd would have a total reserve, after the alarm is sent to the plant operator or responsible party, of 10,256 gallons or 62% of daily projected flow of 16,500 gpd. In normal conditions the system will continue batching as described and the alarm will shut down. However, if the problem is mechanical, the influent level will rise to the high level float in the aeration tank and the lift pump(s) will shut down.

Under normal conditions, a major concern is to set the controls and system timing to prevent wastewater from remaining in the lift station in an anaerobic state for a long period of time. This will not happen with the Bio-Pure system because the equalization tank (lift station) is aerated

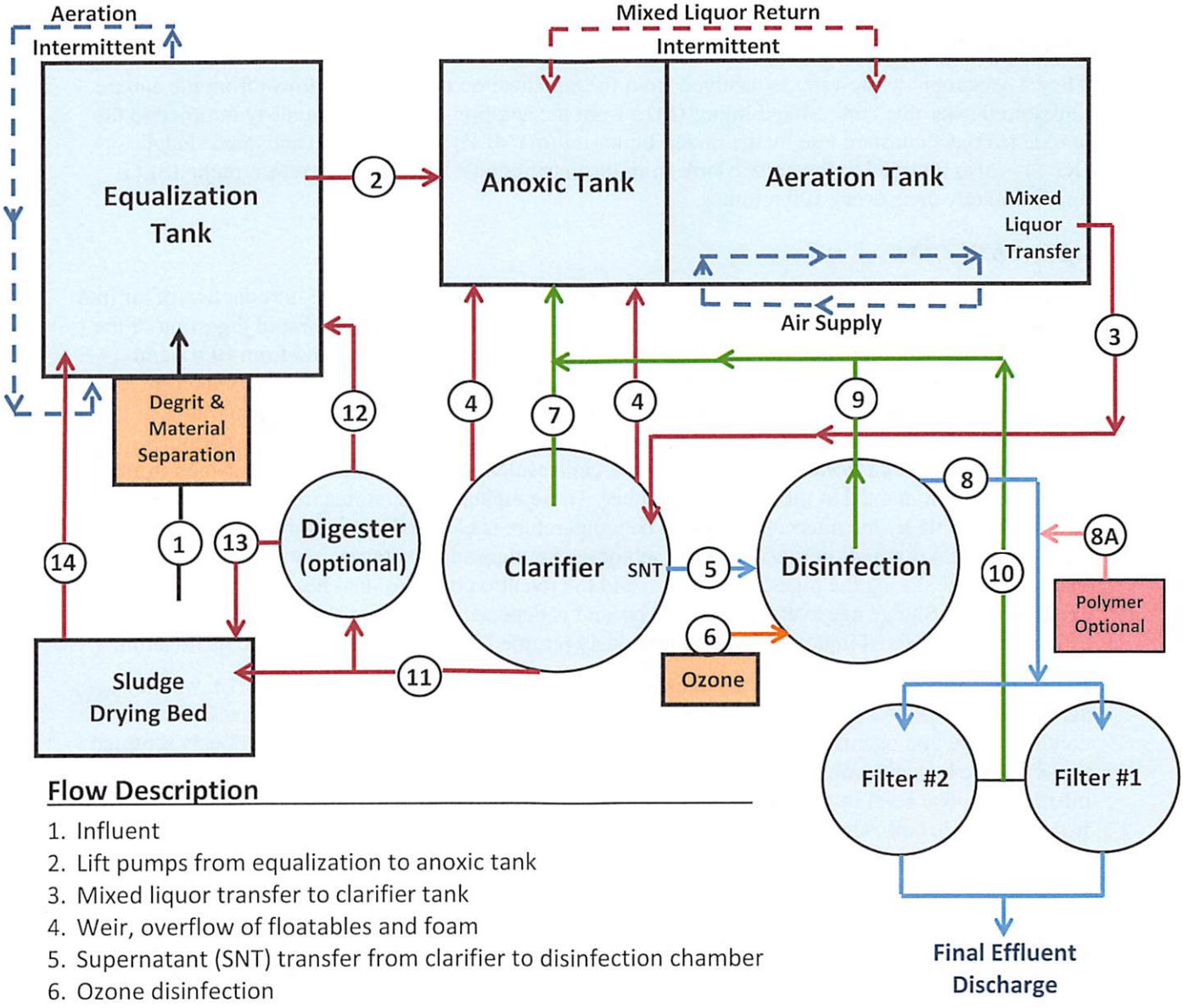
EQUALIZATION/ANAEROBIC TANK

Process: The process in the equalization/anaerobic tank reduces the biochemical oxygen demand (BOD_5) and begins the phosphorus removal process. The low dissolved oxygen demand (DOD) causes the microorganisms to release phosphorus (P) in the form of orthophosphate (PO_4^{-3}) from their cells. Later in the process the microorganisms will absorb greater amounts of P and subsequently release it as orthophosphate.

Flow: The influent enters the equalization/anaerobic tank by gravity. The influent in this tank is continuously mixed using a circulating pump for control of odors created by influent transferred from lift stations located outside the treatment plant. The alternating lift pumps are controlled by a float.

When the influent reaches the first level float (transfer float), one of the lift pumps activates and pumps influent to the anoxic chamber. Another float controls the minimum fluid level and when this float is activated the operating lift pump shuts down maintaining influent above the pump volute. The lift pump(s) will reactivate when the fluid level reaches and activates the transfer float. Should the alarm system float activate in the aerobic tank, an alert is sent to the operator or selected party that there is a problem, and the CPU will shut down the equalization tank lift pumps when the high level float is activated in the aeration tank. When the fluid level is reduced in the aerobic tank one of the equalization tank lift pumps will re-activate and the process continues. However if the problem is not self-corrected there is 62% of daily flow (16,500 gal) of capacity before the whole system must be shut down for repairs.

Figure 2: Basic Design of the Bio-Pure® Wastewater Treatment System



Flow Description

1. Influent
2. Lift pumps from equalization to anoxic tank
3. Mixed liquor transfer to clarifier tank
4. Weir, overflow of floatables and foam
5. Supernatant (SNT) transfer from clarifier to disinfection chamber
6. Ozone disinfection
7. Activated sludge (RAS) clarifier to anoxic/aeration tanks

8A. Polymer injection (optional)

8. Discharge to filters
9. Sludge return from disinfection to anoxic tank
10. Filter backwash to anoxic tank
11. Desludge max 10% of clarifier volume directly to drying bed (class B sludge)
12. Decant from optional sludge digester to equalization tank
13. Digested sludge from sludge digester to sludge drying bed (class A sludge)
14. Decant from sludge drying bed to equalization tank

ANOXIC TANK

Process: This process begins the de-nitrification of the nitrate (NO_3^-) generated in the aeration tank (Figure 2). During the de-nitrification process nitrogen gas (N_2) is released into the atmosphere. During this process the dissolved oxygen (DO) is <0.5 mg/L.

Flow: Anaerobic wastewater is received from the equalization tank and overflows from the anoxic tank into the aerobic tank. Mixed liquor (ML) from the aeration tank is continuously returned to the anoxic tank at a constant rate by the mixed liquor return (MLR) pump. Return activated sludge (RAS) is also returned to the anoxic tank from the clarifier tank by the sludge return pump (SLG) approximately once every 100 minutes.

AERATION TANK

Process: The digestion process in the aeration chamber is carried out with the introduction of air into the incoming wastewater thereby homogenizing the material, which results in rapid digestion of the organic matter. Aeration and mixing are provided to satisfy the oxygen demand from BOD_5 and ammonia oxidation. The soluble material, oxidized material, settled and suspended solids form a mixed liquor (ML). Aeration chamber mean-cell-residence-time for the digestible material is a minimum of 16 hours and is dependent on the final system timing, which is based on periodic effluent testing. This *shorter-than-normal* mean-cell-residence-time is aided by higher-than-normal temperatures maintained in the aeration chamber. These higher temperatures make the waste more readily digestible by the microorganisms. The temperature is elevated by a combination of three factors: the heat dissipation/transfer of the submerged pumps and aspirators, the energy conversion that takes place during the digestion process, and the retention of additional heat by the closed aeration tanks. Sludge age averages 20-30 days and is dependent on system timing, which is based on effluent testing. Mixed liquor (ML) is continuously returned to the anoxic tank for denitrification.

Flow: The influent received from the anoxic tank is now considered mixed liquor (ML), which is aerated and circulated by means of a mixer/air injection system. This ML with air injection will continue to be homogenized in the aerobic tank. ML from the aeration tank is continuously returned to the anoxic tank at a constant rate via the mixed liquor return (MLR) pump for continued de-nitrification. The level in the aerobic tank rises continuously due to the semi-continuously fed ML from the anoxic tank. Once the liquid level in the aerobic tank reaches a preset level, a mixed liquor transfer (MLT) pump is activated to transfer a specific volume (equal to the volume of the clarifier plus 3 minutes weir time) to overflow the ML into a weir that returns floatables and skimables to the aeration chamber for reprocessing. The liquid level in the aerobic tank will then drop to a "standby" position. With the semi-continuously fed ML from the anoxic tank, the level in the aerobic tank will start to rise again, repeating the cycle. This "return process" occurs with every batch cycle 14.7 times per every 24-hour day.

CLARIFICATION TANK

Process: Mixed liquor (ML) is received from the aeration tank. Weirs in the clarifier tank remove and return light ends, floatables and skimmables to the aeration tank. The clarifier is programmed for quiescence settling of 60 or 70 minutes, which also provides for further nitrate and ammonia removal, separating treated effluent from biomass and suspended solids (i.e., activated sludge). After settling the supernatant (SNT) is transferred by gravity to the ozone tank for disinfection. RAS is returned to the anoxic tank after the SNT transfer occurs for further processing.

Flow: Mixed liquor received from the aeration tank is allowed to overflow from the clarifier (settling) tank in excess of the amount required to fill the chamber. When the mixed liquor received

from the aeration tank reaches the point it can weir, a level control activates signaling the CPU to shut down the MLT pump in the aerobic tank within 3 minutes thus allowing the removal of light ends, floatables and skimmables. This float controls the batch process. The clarifier is programmed for quiescence settling of 60 or 70 minutes providing further nitrate and ammonia removal, and separating treated effluent from biomass and suspended solids (i.e., activated sludge). After settling, an actuated valve opens decanting treated effluent (SNT) to the ozone tank where disinfection begins. Following the decanting process, another actuated valve opens and transfers the remaining fluid and returned activated sludge (RAS) to the anoxic tank. When the RAS actuator valve has closed the MLT transfer pump will activate and the batch process continues. The RAS provides food for the live bacteria in the anoxic tank. This combination of RAS and the thorough mixing and aeration process all but reduce the necessity to de-sludge (see Sludge Wasting Ratios Section below). The system is designed to batch a minimum of 14.4 times per day at a maximum batch time line of 100-120 minutes.

OZONE DISINFECTION TANK

Process: The U.S. EPA disinfection criterion for ozone is CT[1] = 1.6, which is 0.4 mg/l for 4 minutes contact time or 0.04 mg/L per minute. The Bio-Pure ozone systems are sized to provide the required disinfection over a 40 minute period rather than 4 minutes. This approach allows complete contact time and a 99.9% kill on all micro-organisms (bacteria, viruses, protozoa, yeast, cysts, algae, fungal mold and spores). This procedure reduces the size of the ozone unit required, which also reduces the power consumption. Effluent dissolved oxygen (DO) above 8 mg/L is attainable when combined with the system's continuous down-flow and backwash filters. Ozone is injected via stainless steel diffusion rods located in the ozone chamber. Ozone injection continues for a minimum of 40-45 minutes thereby assuring complete pathogen kill. Bio-Pure systems have accomplished a 99.99% removal of viruses, bacteria, helminthes, and other disease-bearing organisms

The ozone generator rating in Bio-Pure systems in grams/hour are more than twice that required for the same volume of potable water treatment, negating the need for chlorination. Many states have totally banned the use of chlorine for any form of fresh-water/wastewater disinfection and are relying completely on ozone or ultraviolet methods. Chlorine is a choice of last resort, but it is not effective against viruses and has been recognized as participating in the formation of a class of carcinogenic chemicals called trihalomethanes (THMs)[2]. The chemical disinfectant potential (V) of ozone is 2.07 compared to 1.36 for chlorine as hypochlorous acid (HClO) and 0.25 as the hypochlorite ion (OCl^-). Ozone causes immediate destruction of bacteria and viruses through oxidation as opposed to merely altering the DNA to prevent replication as is the case with ultraviolet treatment.

Flow: After the activated valve has transferred supernatant from the clarifier tank for 1 minute the ozone injection-disinfection process begins and lasts for a total of 40 minutes. Next is the filtering process. However, the ozone injection continues until the effluent level in the ozone tank is within two feet of the diffusers. This procedure promotes additional disinfection, and assists the filtration process together with increasing the concentration of DO in the effluent.

FILTRATION

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[1] A CT value is the product of the concentration of a disinfectant (e.g., free chlorine) and the contact time with the water being disinfected. https://www.safewater.org/fact-sheets-1/2017/1/23/what-is-chlorination

[2] Trihalomethanes (THM) are chemicals (e.g., chloroform) that can be formed along with other disinfection byproducts when chlorine or other disinfectants used to control microbial contaminants in water react with naturally occurring organic and inorganic matter in water. https://en.wikipedia.org/wiki/Trihalomethane; https://archive.epa.gov/enviro/html/icr/web/html/gloss_dbp.html

Process: The filtration component in Bio-Pure systems may be either a standard sand filter system or a rotating disk filter. In either case, filtration is a continuous down flow, self-backwashing system that uses a compressor for air lift in the process. Polymer can be added, if necessary, to the inlet side of the filter to assist with the removal of Giardia Cysts[3] as well as to reduce turbidity and total coliform. Bio-Pure systems have proven to reduce total coliform to <2 MPN/100 ml and turbidity of ≤2 NTU's[4] meeting the 2 NTU water quality standard of most regulatory authorities.

Flow: When the effluent discharge pump activates and the filtering process begins the polymer pump also activates. Filtering time is controlled by a liquid level sensor in the ozone tank which deactivates when a predetermined volume of effluent has been discharged. The filtration system continuously backwashes with the contents returned to the equalization tank. Once the correct volume is filtered the actuator valve opens and drains the balance of the ozone tank to the equalization tank. As soon as the ozone tank is empty the clarifier transfers more SNT to the ozone tank for disinfection and filtering.

Membrane Bioreactor (MBR) option: If higher quality of the effluent water is required (e.g., BOD_5 <5 mg/L, TSS <5 mg/L, bacteria <2 MPN/100 mL), Bio-Pure systems can be equipped with a membrane bioreactor (MBR) which is capable of achieving a higher level of filtration. A U.S. EPA factsheet[5] states the following about MBR filtration: *"The effluent from MBRs contains low concentrations of bacteria, total suspended solids (TSS), biochemical oxygen demand (BOD), and phosphorus. This facilitates high-level disinfection. Effluents are readily discharged to surface streams or can be sold for reuse, such as irrigation."* In this factsheet, EPA describes several sewage treatment facilities equipped with an MBR filtration unit for which the BOD levels have been documented to be routinely decreased to <2 mg/L. For most situations, standard sand or rotating disk filters are sufficient to meet targeted water quality standards.

SLUDGE PRODUCTION

It is important that the reader understand that sludge generation in sewage wastewater treatment is a function of several factors, the most important of which are the composition of incoming waste, the treatment process being used, system design, collection system integrity, and plant operator skills. The two most significant factors determining the amount of sludge a system will generate are the process in use and the collection system integrity.

Unlike municipal flow-through-type systems where sludge is continually drawn off thus producing high volumes of sludge that must be disposed of, the Bio-Pure batch-flow system retains and recycles

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[3] *Giardia* is a protozoan parasite that infects the intestines of humans and animals. Giardia cysts are the most resistant forms of the life cycle and are responsible for transmission of the organism. Both cysts and trophozoites can be found in the feces (diagnostic stages). The cysts are hardy and can survive several months in cold water. Infection occurs by the ingestion of cysts in contaminated water, food, or by the fecal-oral route (hands or fomites). When a person gets sick, the infection is called giardiasis, or 'beaver fever'. Symptoms of giardiasis include diarrhea, stomach cramps, gas, bloating, nausea, and fatigue. https://www.mcdinternational.org/trainings/malaria/english/DPDx5/HTML/Frames/G-L/Giardiasis/body_Giardiasis_page1#Causal%20Agent

[4] NTU or Nephelometric Turbidity Units is a standard measure of turbidity in water testing. The test uses an electrode that employs a Nephelometric technique in accordance with ISO 7027 and Formazin as a reference standard.

[5] U.S. EPA. Wastewater Management Fact Sheet 1: Membrane Bioreactors. (2007). https://www.epa.gov/sites/production/files/2019-08/documents/membrane_bioreactor_fact_sheet_p100il7g.pdf

the sludge until the daily settlometer (SSV-60) test indicates a supernatant-to-sludge ratio of 1:1 (500 mg/L) occurs in samples taken from the aeration tank.

In each clarifier batch, 67% of the total volume of mixed liquor (ML) is considered sludge volume. In each batch, 100% of the sludge volume is returned to the anoxic tank once in every batch cycle, or 14.7 times in every 24-hour period. Thus, a continuous biologic reduction in sludge takes place as opposed to a one-time biologic process in a flow-through system. This is commonly referred to as 100% RAS.

Characteristics of the sludge play an important part in the clarifier settling time. A good food source, along with oxygen, produces fluffy bacteria. It is these light, fluffy bacteria that produce the flocking action in the aeration chamber. Once the mixed liquor is transferred to the clarifier, where both the food source and oxygen are depleted, the sludge loses its fluffiness and is pulled down by gravity, creating a distinct line of separation between the sludge and the clarified supernatant liquid. The supernatant transfer volute is shielded and located above this separation line (all settling takes place under quiescent conditions), so no sludge is transferred to the next treatment step, which is the disinfecting stage in the ozone contact chamber.

SLUDGE WASTING

A 20,000 gpd Bio-Pure system clarifier has an operating capacity of 4,420 gallons, of which 1,473 gallons are supernatant volume and 2,946 gallons are sludge volume. Because 100% of this sludge volume is recycled back to the aeration chamber 14.7 times in every 24-hour period, and because of the low food-to-microorganism ratio maintained in the aeration chamber, total sludge digestion is very high and residual sludge production is very low.

Sludge wasting of 5% (147 gallons) of the clarifier sludge volume of 2,946 gallons is performed when the SSV-60 test reaches 500 ml, which, based on systems now in operation, will probably occur for the first time early in the second year of system operation. Should sludge wasting become necessary, 5% of the clarifier sludge volume would be transferred to a small sludge drying bed.

Sludge digester option: This option consists of adding a sludge digester tank that can hold 5% of the clarifier volume. After the proper retention time, the separated water is returned to the buffer tank and the de-watered sludge can be used for some beneficial purpose (e.g., deposited directly around landscape vegetation). Because the dried sludge is activated, no odor is produced and it can be safely handled. However, depending on permit requirements the sludge may be required to be removed by a licensed septic-waste hauler and disposed of as required by law. A sand sludge drying bed for this size of system and operation would require about 63 square feet of surface and a sand depth of about eighteen inches.

WATER QUALITY OF BIO-PURE EFFLUENT

Effluent from a properly designed, installed, maintained, and operated Bio-Pure system, treated with ozone and subjected to pressure filtration has proven over the years to routinely meet or exceed the strictest regulations whether federal, state, county or city.

The following table is a summary of effluent water quality collected over a three-year period on five operating Bio-Pure systems ranging in size from 10,000 gpd to 50,000 gpd. The reclaimed water exceeds California Title 22 requirements for recreation and unrestricted irrigation. Although the reclaimed water meets drinking water quality standards, JMCS Services does not recommend it be used for this purpose.

Parameter	Influent	Effluent	California Title 22 standards*
BOD_5	Avg. 456 mg/L	Avg. 5.4 mg/L	10 mg/L
Total Suspended Solids	Avg. 223 mg/L	Avg. 5.2 mg/L	10 mg/L
Coliform count		<2 MPN/100 mL	2.2 MPN/100 mL
Turbidity		Avg. 2.3 NTU	2.0 NTU
Total N		Avg. 1.7 mg/L	2.26 mg/L; 10 mg/L as nitrate

* California's Title 22 standards define drinking water quality.

In summary, Bio-Pure effluent:

1. Routinely meets California Title 22 drinking water standards. Water that meets these standards can be used for unrestricted food-crop irrigation and recreation. In existing installations, effluent water is commonly used for golf course and greenbelt irrigation. It is safe for discharge into surface water bodies used for recreational purposes. JMCS Services does not recommend using Bio-Pure effluent water as drinking water.
2. Removes 99.99% of viruses, bacteria, helminths, and other disease-bearing organisms resulting in the production of reclaimed water that meets U.S. EPA and California Public Health Standards for drinking water. Ongoing monitoring required under NPDES permits on operating systems in California verifies these drinking water standards have been consistently met over several years of operation.
3. Achieves a survival rate of 100% in the 96-hr Static Acute Screening Bioassay with Fathead Minnows.

OTHER FEATURES AND CONSIDERATIONS

In selecting any wastewater treatment system, consideration must be given to the flexibility and ease of operation, rapid availability of spare parts, and completeness of design with emphasis on the ability to modularly phase in additional systems to accommodate additional hydraulic and biologic loading.

The Bio-Pure system and wastewater treatment process represents an uncommonly high degree of discharge control flexibility, which has been proven by the large number of systems in operation throughout the world, many of which have been in continuous operation for more than 40 years.

Bio-Pure systems are designed for minimum onsite human operator attendance, and can be set up for remote operator management via a SCADA[6] interface. The microprocessor-controlled treatment process is smooth and error-free and, once the operating system is programmed, the operation will continue reliably until reprogrammed.

Anticipating an average level of regulatory mandated reporting requirements, the system operation, maintenance, and testing should on average take no more than one hour per day. JMCS Services recommends that these services should be performed under contract with a certified sanitarian as the "operator of record". Selected operators and plant owners will receive a minimum of 8 hours of training in Bio-Pure system theory, maintenance, and operation by JMCS Services.

[6] SCADA stands for "Supervisory Control and Data Acquisition". SCADA is a type of process control system architecture that uses computers, networked data communications and graphical Human Machine Interfaces (HMIs) to enable a high-level process supervisory management and control. SCADA systems communicate with other devices such as programmable logic controllers (PLCs) and PID controllers to interact with industrial process plant and equipment. https://www.electrical4u.com/scada-system/

The Bio-Pure system is designed for easy access during general maintenance. Should any pump or internal part need replacement, it can be accomplished within 1 to 2 hours or less with no specialized tools or equipment required.

All automatic and manual operations are performed at a wall-mounted high-reliability microprocessor control panel. Flow volume and settling time are monitored automatically. Should manual operation be required, the automatic systems may be overridden.

Bio-Pure systems are delivered to the installation site complete with all tanks, pumps, blowers/aspirators, and internal and external plumbing to ensure compatibility and proper sizing. All internal plumbing and control panel connections are included. All items of the wastewater treatment system are warranted either by JMCS Services or the purchased component manufacturer.

IMPLEMENTATION SCHEDULE

Manufacturing and delivery time for a complete Bio-Pure system to the installation site is approximately 60 to 90 days. Installation time after receipt of the equipment at the site is approximately 7 to 14 days. Therefore, system startup can be expected approximately 67 to 104 days after the order is placed and JMCS Services receives the purchase deposit. A JMCS Services representative will *oversee* installation, startup, and operator training.

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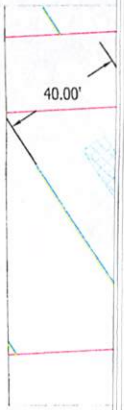

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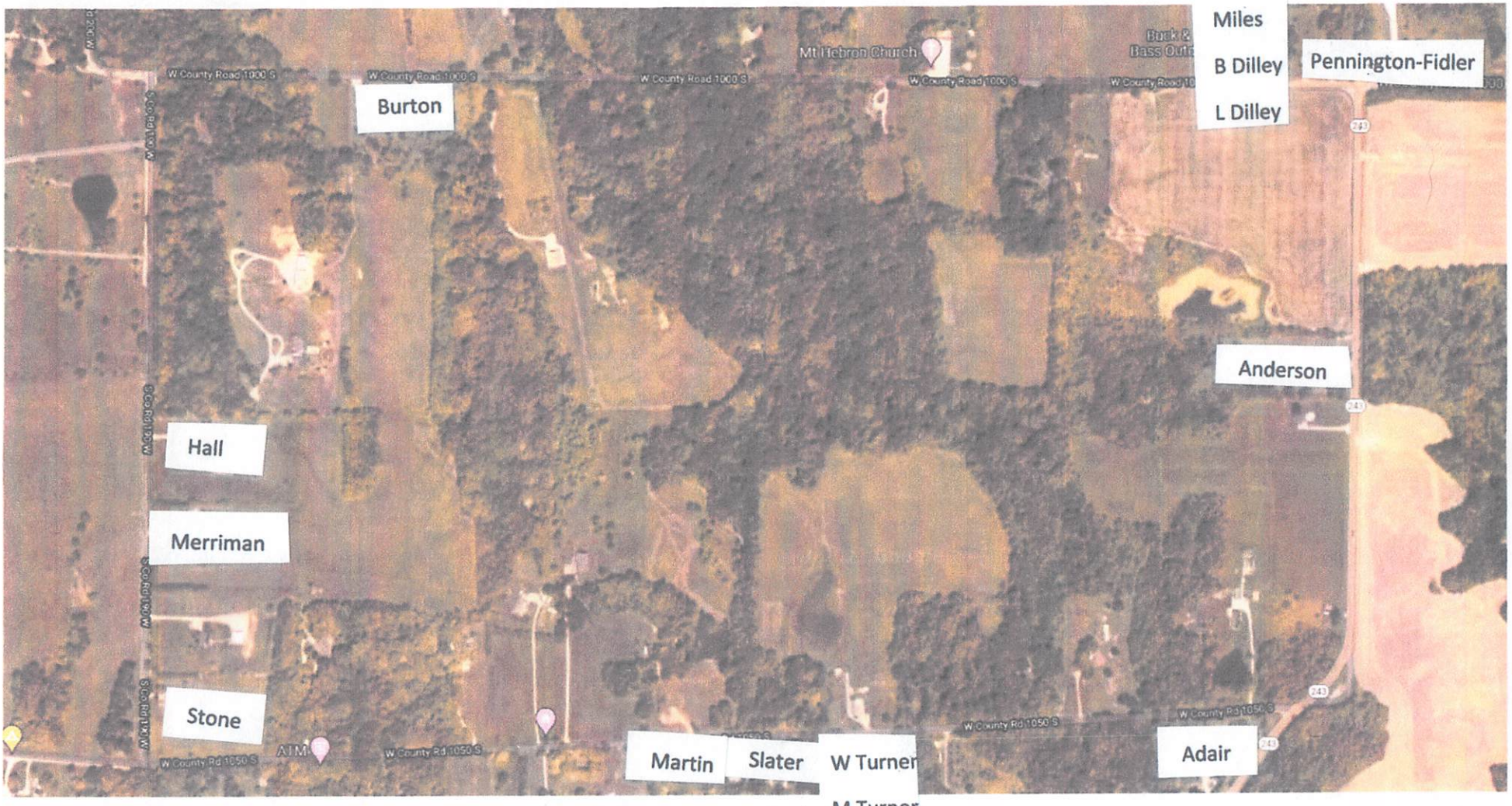
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